



Naval Science 2

INSTRUCTOR GUIDE

MARITIME HISTORY
LEADERSHIP
NAUTICAL SCIENCES

NAUTICAL SCIENCE 2: MARITIME HISTORY, LEADERSHIP AND NAUTICAL SCIENCES

INSTRUCTOR GUIDE

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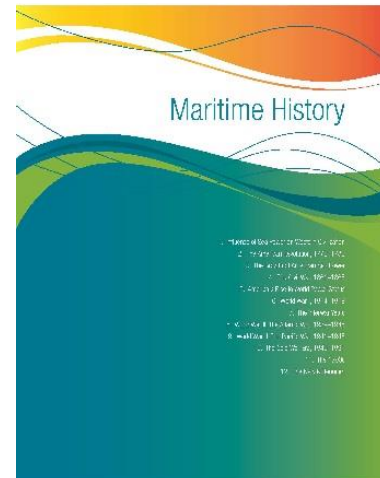
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Module 1: Maritime History

Module Overview

Module Objective:

In this module you will develop a sound appreciation for the heritage and traditions of America, with recognition that the historically significant role of sea power will be important in America's future, and develop in each cadet a growing sense of pride in his/her organization, associates, and self. These elements are pursued at a fundamental level.



Module Organization:

Chapter Number	Chapter Name	Instructional Section / PowerPoint
1	Sea Power	NS2-M1C1S1 – Sea Power
		NS2-M1C1S2 – The Age of Discovery
2	The American Revolution	NS2-M1C2S1 – Prelude to Revolution
		NS2-M1C2S2 – The Crucial Year 1777
3	The Growth of American Sea Power	NS2-M1C3S1 – A New American Government
		NS2-M1C3S2 – Toward War with England
		NS2-M1C3S3 – Advancing the Sea Power
		NS2-M1C3S4 – Clipper Ships and Japan
4	The Civil War	NS2-M1C4S1 – Introduction to the Civil War
		NS2-M1C4S2 – The Battle for Control of the Mississippi
		NS2-M1C4S3 – Charleston
5	The Rise to World Power Status	NS2-M1C5S1 – Post-Civil War Recovery to the Spanish American War

		NS2-M1C5S2 – Operations in the Caribbean
6	World War I	NS2-M1C6S1 - World War I
		NS2-M1C6S2 – Undersea Warfare
7	The Interwar Years	NS2-M1C7S1 – Prewar Events
		NS2-M1C7S2 – Final Steps Toward War
8	World War II – The Atlantic War	NS2-M1C8S1 - World War II in the Atlantic
		NS2-M1C8S2 – The Battle of the Atlantic
		NS2-M1C8S3 – The Italian Campaigns
		NS2-M1C8S4 – D-Day and Operation Anvil
9	World War II – The Pacific War	NS2-M1C9S1 – Pearl Harbor
		NS2-M1C9S2 – Japanese Defense Perimeter
		NS2-M1C9S3 – The Battles for Guadalcanal
		NS2-M1C9S4 – Return to the Philippines
		NS2-M1C9S5 – The Battle of Okinawa
10	The Cold War Era	NS2-M1C10S1 - Beginnings of the Cold War
		NS2-M1C10S2 – NATO
		NS2-M1C10S3 – Breakout at Pusan
		NS2-M1C10S4 – New Naval Capabilities
		NS2-M1C10S5 - Vietnamization
		N22-M1C10S6 – Grenada and Panama
11	The 1990s and Beyond	NS2-M1C11S1 – Middle East Conflicts
		NS2-M1C11S2 – Conflict in the Balkans
		NS2-M1C11S3 – Drug Trafficking
12	The New Millennium	NS2-M1C12S1 - The Global War on Terrorism
		NS2-M1C12S2 – Piracy
		NS2-M1C12S3 – Ballistic Missile Defense

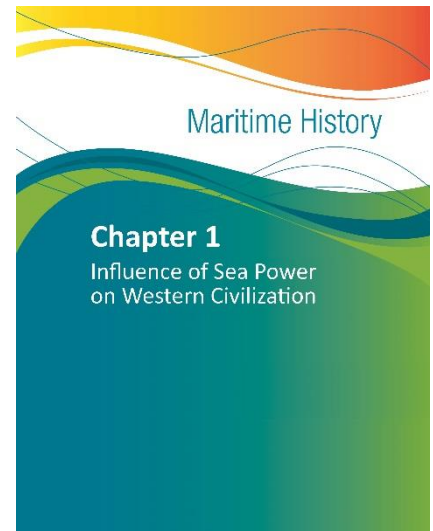
Module 1 Chapter 1: NS2M1C1 – Sea Power and Western Civilization

What Students Will Learn to Do:

Demonstrate the knowledge of how sea power influenced the growth of Early Western Civilization

Skills and Knowledge to be Gained:

1. Describe the importance of sea control
2. Explain how sea and power evolved and its influence on the ancient world
3. Describe the conflict between the Greeks and the Persians in 492 B.C.
4. Describe the rise of the Roman Empire and its influence on civilization from 275 B.C to 476 A.D.
5. Explain how the Roman Empire was free to spread throughout the Mediterranean
6. Describe the fall of the Roman Empire and subsequent thousand years of turmoil that followed
7. Describe the events that caused the Turks to lose the Battle of Lepanto in 1571 and their control of the Mediterranean area
8. Describe the growth of the world during the Age of Discovery
9. Describe the conflict between England and Spain in 1570
10. Explain how the English defeated the Spanish Armada
11. Describe methods used by England to build her empire in the 17th century



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...
- RI.9-10.7. Analyze various accounts of a subject told in different mediums...

Writing

- W.9-10.1. Write arguments to support claims in an analysis of substantive topics or texts...
- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.8. Gather relevant information from multiple authoritative print and digital sources...

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative

Language

- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

Module 1 Chapter 1: NS2M1C1 – Sea Power and Western Civilization

College, Career, and Civic Life (C3) – Framework for Social Studies State Standards**

Dimension 2. Geography

- D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them.
- D2.Geo.6.9-12. Evaluate the impact of human settlement activities on the environmental and cultural characteristics of specific places and regions.
- D2.Geo.7.9-12. Analyze the reciprocal nature of how historical events and the spatial diffusion of ideas, technologies, and cultural practices have influenced migration patterns and the distribution of human population.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place as well as broader historical contexts.
- D2.His.16.9-12. Integrate evidence from multiple relevant historical sources and interpretations into a reasoned argument about the past.

Dimension 4. Communicating Conclusions and Taking Informed Action

- D4.1.9-12. Construct arguments using precise and knowledgeable claims, with evidence from multiple sources...
- D4.2.9-12. Construct explanations using sound reasoning, correct sequence...
- D4.6.9-12. Use disciplinary and interdisciplinary lenses to understand the characteristics and causes of local, regional, and global problems...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 1 / Section 1: NS2-M1C1S1 – Sea Power

(Section 1 of 2)

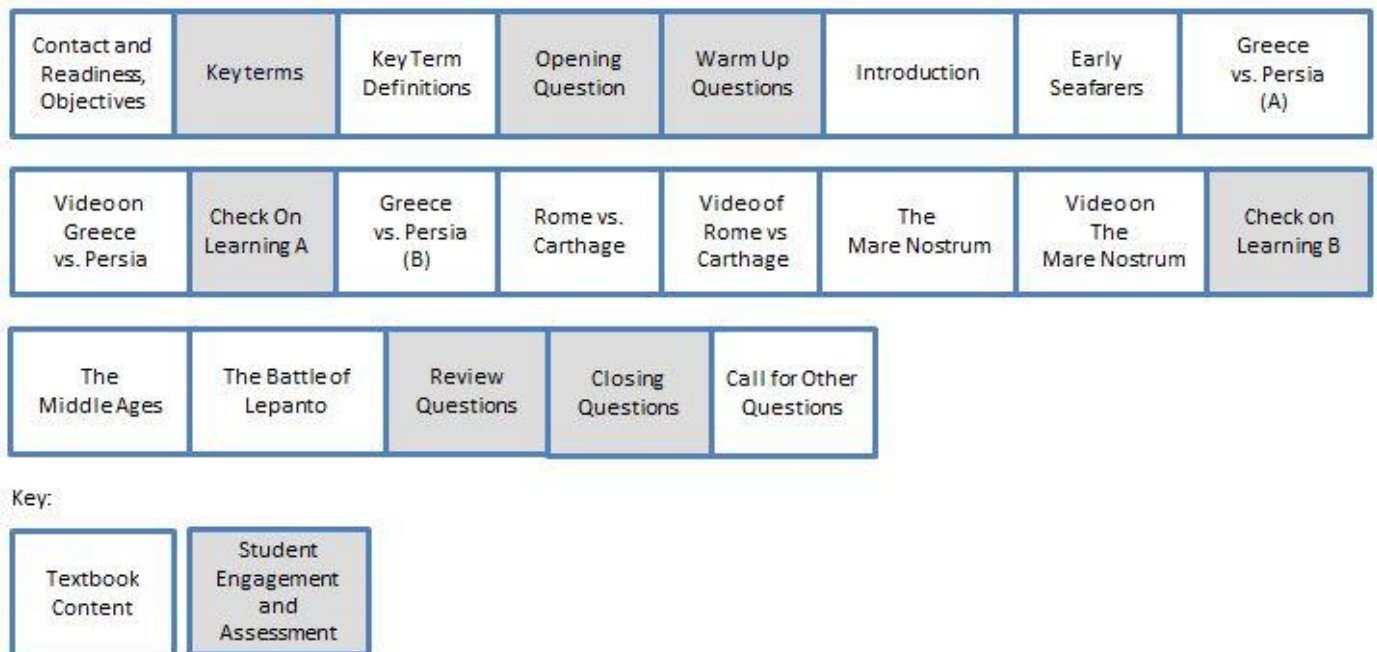
What Students Will Learn to Do:

Demonstrate the knowledge of how sea power influenced the growth of Early Western Civilization

Skills and Knowledge to be Gained:

1. Describe the importance of sea control
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4. Describe the rise of the Roman Empire and its influence on civilization from 275 B.C to 476 A.D.
5. Explain how the Roman Empire was free to spread throughout the Mediterranean
6. Describe the fall of the Roman Empire and subsequent thousand years of turmoil that followed
7. Describe the events that caused the Turks to lose the Battle of Lepanto in 1571 and their control of the Mediterranean area

LESSON FLOW OUTLINE



Chapter 1 / Section 1: NS2-M1C1S1 – Sea Power

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 1. Place a checkmark beside the NS2-M1C1S1 PowerPoint presentation, and these two CPS question deck files: NS2-M1C1S1 - Key Terms and NS2-M1C1S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will discuss the importance of sea control and how it has evolved, and the influence it had on the ancient world. We will cover the conflicts during this period of time, from the Greeks and Persians in 492 B.C. to the Roman Empire and its influence on civilization. We will look briefly at the wars and battles of that time, particularly the Battle of Lepanto. The winner of this battle would determine the course of Western Civilization. We will examine the Turkish control of the middle east and how (the Turks) this control caused seafaring nations looking for new trade routes to the Orient.</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-7
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Name some reasons why early people might have feared the sea.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on sea power and the early western civilizations.	8
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	9

Chapter 1 / Section 1: NS2-M1C1S1 – Sea Power

Introduction	<p>Explain that sea power is the ability to use the sea to meet a nation’s needs. It means being able to defend a nation’s own sea-lanes, and the ability to deny an enemy the use of the sea in time of war.</p> <p>Explain that sea power played a major role in the development of early Western civilization. In many wars throughout history, a single major victory at sea made winning possible. Defeat of the enemy’s fleet kept it from supplying its land forces. The victor was then able to attack the enemy’s homeland, thus winning the war on land.</p>	10
Early Seafarers	Explain that early people feared the seas. They saw them as barriers. Gradually, they learned to use the water, both as a way to get food by fishing and as an easier way to travel and conduct trade. Travel by sea was faster, cheaper, and safer than travel over land. Before long the countries bordering the Mediterranean Sea that carried on the most trade became the richest and most powerful in that region.	11-12
Early Seafarers	Explain that the first European people to use sea power were the sailors and traders of ancient Crete, a large rocky island south of Greece. Some 4,000 years ago (2500-1200 B.C.) the Cretans dominated their neighbors on the shores of the Aegean Sea, countries now known as Greece and Turkey. This was inevitable because of Crete’s geography. The island was too rugged for farming, and it sits right on the major sea routes of the eastern Mediterranean.	13
Early Seafarers	Explain that the Phoenicians were the next to master the sea in this region. From about 2000 to 300 B.C., their ships roamed throughout the Mediterranean, carrying tin from Britain, amber from the Baltic Sea, and slaves and ivory from western Africa. The Phoenicians established great ports at Tyre and Sidon in what is now Lebanon	14
Early Seafarers	Explain that these port cities were at the end of the Asian caravan routes, which brought in the wealth of Asia. Phoenician ships carried this wealth to the coastal trading cities around the Mediterranean and to northern Europe. The Phoenicians also started colonies and trading stations, which grew into new centers of civilization. The Phoenician alphabet became the written language of traders, and they were the first to use money as a means to facilitate trade. Later, the Phoenician alphabet became the basis for our own alphabet. The greatest of the Phoenician colonies grew to be the empire of Carthage in North Africa, later the main opponent of Rome.	15
Early Seafarers	Explain that next came the Greeks. Famous Greek authors—Herodotus, Thucydides, and Homer—wrote detailed, semi-fictional accounts of early sea power. One of the more well known of these tales is about the Trojan War. It is based on an actual series of conflicts fought between 1200 and 1190 B.C. to control the Hellespont, now called the Dardanelles (Turkish Straits), in order to take control of the Aegean–Black Sea trade. By 500 B.C., the Greek city-states had achieved a high level of civilization, and their trading ships and naval vessels sailed the entire Mediterranean Sea. Many prosperous Greek colonies developed in Asia Minor (Turkey), Sicily, Italy, France, and Spain. They took over sea control from the Phoenicians.	16
Early Seafarers	Explain that early trading vessels were clumsy craft, easy prey for armed robbers in smaller, swifter craft. So merchants began to crew vessels with hired seagoing soldiers to protect their ships and to patrol the seaways. Navies thus came into being, using special ships called galleys (which could be propelled by oars as well as by sails) crewed by trained fighting men.	17

Chapter 1 / Section 1: NS2-M1C1S1 – Sea Power

Greece vs. Persia	Explain that by 492 B.C. Greek expansion had run into the mighty forces of Persia (now Iran) moving westward into the eastern Mediterranean. The Greeks were able to hold off two Persian invasions in the next twelve years but then were forced to withdraw from their northern lands in Thrace and Macedonia. In 480 B.C. Xerxes, the Persian king, undertook a huge invasion to try to conquer the Greeks once and for all. Knowing that sea power would be necessary for a victory, Xerxes built a navy of 1,300 galleys. This fleet followed his 180,000-man army westward around the coast of the Aegean Sea, guarding his flank and carrying his supplies.	18-20
Greece vs. Persia	Explain that Themistocles, the Greek commander, realized that the only way the Persians could be stopped was to break this Persian sea line of communication supporting Xerxes' army from Asia Minor. He convinced the Greeks to build a naval force of 380 triremes, a type of multi-decked war galley. Greek strategy was to hold the Persian army at bay at the narrow pass of Thermopylae, while the Greek fleet struck the Persian fleet in a series of hit-and-run attacks in the waters among the Greek islands. But a traitor showed the Persian army a secret mountain pass, which enabled the Persians to surround and destroy the Greek defenders at Thermopylae.	21
Greece vs. Persia	Explain that Xerxes' army now continued south to plunder the abandoned city of Athens. The Greeks took up new positions at the Isthmus of Corinth. Meanwhile their fleet moved south to the waters around the island of Salamis, near Athens, to protect their eastern flank.	22
Greece vs. Persia	Explain that bad weather and the Greek hit-and-run attacks had by this time reduced the Persian fleet to 800 vessels. There were only 300 Greek triremes left to oppose them. Splitting his force, Xerxes sent 200 galleys to block the retreat of the Greek fleet around Salamis. The remaining 600 galleys moved directly against the Greek fleet in the narrow strait between Salamis and the shore. But in the narrow strait, the Persians lost the advantage of numbers, since only the lead ships had contact with the Greek fleet, which was better armed. So the Greeks were able to prevail. About half the Persian fleet was sunk with great loss of life, compared to a Greek loss of only 40 ships. Xerxes watched the unfolding disaster from a throne set up on a hill overlooking the battle. Upon realizing his fleet was wiped out, he ordered his army to begin a long retreat.	23
Video on Greece vs. Persia	Show video on Greece vs. Persia	24
Check on Learning Questions A(Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	25
Greece vs. Persia	Explain that following this battle, there was a short period of peace and prosperity, thereafter known as the Golden Age of Athens. Theater, sculpture, writing, and philosophy flourished. The concept of democracy in government was born. Thus the foundations of Western civilization were laid, and the key event that made this possible was the sea battle of Salamis in 480 B.C.	26
Greece vs. Persia	Explain that during the next 150 years, Greek civilization moved steadily eastward, conquering most of what was the Persian Empire. Under Alexander the Great of Macedonia, Greek culture spread throughout the entire eastern Mediterranean. The great port of Alexandria in Egypt was established. Persia was driven from the seas, and the reign of the Phoenicians was ended. Macedonia became the world's greatest sea power, conquering most of the civilized Western and Middle Eastern world.	27-28

Chapter 1 / Section 1: NS2-M1C1S1 – Sea Power

Rome vs. Carthage	Explain that the Greeks controlled the eastern Mediterranean for the next two centuries. In the western Mediterranean, however, Greek expansion was checked by the rising sea power of Carthage, a city-state in North Africa founded in the late eighth century B.C. by the Phoenicians. But on the Italian peninsula, a new power was emerging: Rome. In 275 B.C., the Romans conquered Italy, including the Greek colonies in the south. In the process, they absorbed the Greek culture, helping to continue the advance of Western civilization. In their way, however, was a strong rival: Carthage. In 265 B.C., the first of several bitter conflicts between the two powers began in Sicily. Together these conflicts were known as the Punic Wars (Punic is a Latin variation of the word “Phoenician,” or Punicus).	29
Rome vs. Carthage	Explain that at the beginning of the Punic Wars, Rome saw what sea power and a strong navy could do. The Carthaginian navy protected Carthage from attack by the Romans, harassed Roman sea commerce, and plundered the Roman coast.	30
Video of Rome vs Carthage	Show video of Rome vs. Carthage.	31
Rome vs. Carthage	Explain that the Romans studied Greek sea tactics and eventually improved on them. As the Punic Wars progressed, Roman seamanship and tactics overcame the Carthaginians, driving them from the sea. The first Punic War gave Rome the island of Sicily as a province, and the second Punic War gave Spain to Rome. The third Punic War began with an amphibious invasion of North Africa. By the time it was over, Carthage had been burned, and Carthaginian power was destroyed forever.	32
The Mare Nostrum	Explain that the Roman Empire was now free to spread throughout the Mediterranean. The Roman navy cleared the Mediterranean of pirates, moved and supported Rome’s armies, and defeated any hostile fleets.	33
The Mare Nostrum	Explain that in the first century B.C., during the confusion following the assassination of Julius Caesar, rebellious Romans and their Egyptian allies under the command of Mark Antony and Queen Cleopatra, tried to overthrow the Roman Empire. However, the rebellion was crushed in 31 B.C. at a great sea battle near Actium (Greece). The Roman Admiral Agrippa destroyed the Egyptian fleet with blazing arrows and pots of flaming charcoal. In an earlier battle at Naulochus, Agrippa had defeated Pompey, Caesar’s other rival to power, and secured the western Mediterranean. The Battle of Actium put the whole eastern Mediterranean in the Roman Empire.	34-35
The Mare Nostrum	Explain that for more than five centuries after Actium, trade vessels could move freely from the Black Sea to Gibraltar with little fear. The Mediterranean had become the Roman Mare Nostrum (Our Sea) with all coasts, ports, and naval bases controlled by Rome. On land and sea the Pax Romana (Roman Peace) was established, the longest period of peace in world history. Roman law, government, art, language, and religion were firmly established in western Europe, the Middle East, and North Africa. Western civilization today can be traced to Rome and to the earlier Greek contributions.	36
Video on the Mare Nostrum	Show video on the Mare Nostrum	37

Chapter 1 / Section 1: NS2-M1C1S1 – Sea Power

Check on Learning Questions A (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	38
The Middle Ages	Explain that eventually, Rome's greatness began to decline, due to social, political, and economic breakdowns too extensive to discuss here. As Rome declined, the empire broke up into two parts. The Eastern or Byzantine Empire had its capital at Constantinople (after 1930 called Istanbul), and the Western Empire kept its capital at Rome. Barbarian invaders from northern and central Europe conquered Rome and deposed the last emperor in A.D. 476.	39
The Middle Ages	Explain that from then on, for the next thousand years, Europe was in constant turmoil, and there was a constant threat of Muslim/Arab expansion into the Mediterranean from northern Africa. The period of western European history from the fall of Rome until about the eleventh century has been called the Dark Ages, because of numerous invasions of barbaric tribes, incursions of North African Moors, religious bigotry, and a general lack of education among the masses of people. Only in the region around Constantinople, where much of the Roman tradition was preserved, was there a general advance of culture during this period. In the late eleventh century, the Crusades, religious-military expeditions to retake the Holy Lands from the Muslims, began gradually to hasten a reawakening of culture and education in western Europe. This movement flourished in the thirteenth through sixteenth centuries. This time is referred to as the Renaissance (the Rebirth) in western European history.	40
The Middle Ages	Explain that in the eastern Mediterranean, however, the Byzantine Empire, centered in what is now Turkey, defeated the advancing Muslims at Constantinople in A.D. 717. The Byzantines thereafter prospered and blocked additional westward Muslim overland expansion. The Muslims became largely content with piracy on the Mediterranean and with strengthening their control over their huge North African and Middle Eastern territories. Muslim fleets dominated the Mediterranean at this time. By the eleventh century, though, Christendom was ready to contest Muslim control. The Muslims were expelled from Sardinia and Sicily and pushed into southern Spain. The First Crusade, initiated by Pope Urban II in 1095, recaptured Jerusalem and nearly swept the Arabs from the Mediterranean.	41-42
The Middle Ages	Explain that over the next 300 years, the religious fervor that had brought on the Crusades turned more to commercial expansion by the Italian states. Their merchant fleets took advantage of the Muslim retreat. Venice profited most from the increased trade and became the biggest center of commerce between Asia and Europe. It hired out ships to Crusaders and gave the Arabs commercial favors, thus profiting from both sides. Venice acquired Crete and Cyprus in the course of these events. By 1400 Venice was at the height of its power, with a fleet of 3,000 ships.	43-44
The Middle Ages	Explain that the north German port cities were on the opposite end of much of the Venetian trade. They formed the Hanseatic League, or the Hanse, which dominated the northern and western European economy. The Baltic and North Seas became to some degree in the north what the Mediterranean had been for centuries in the south.	45
The Middle Ages	Explain that by now, the Islamic cause had been taken over by the aggressive Ottoman Turks. They swept across the Dardanelles into southeastern Europe and captured Constantinople in 1453. The fall of the Byzantine Empire removed the barriers to Muslim advances into Europe. The Turks swept to the very gates of Vienna, Austria. Muslim fleets sought domination of the Mediterranean and control of the profitable east-west trade.	46

Chapter 1 / Section 1: NS2-M1C1S1 – Sea Power

The Battle of Lepanto	Explain that for some time the divided Christian states could not get organized to oppose the Turks, but after the Turkish conquest of Cyprus in 1570, fear of the Turks finally drew the states together. Spain and the Italian states agreed to combine their fleets for a conclusive battle with the Turks. The winner would have a significant effect on the course of Western civilization.	47
The Battle of Lepanto	Explain that the Christian fleet, commanded by Don John of Austria, was composed of some 200 galleys, mostly Venetian and Spanish. The Ottoman fleet, commanded by Ali Pasha, numbered about 250 galleys. For their main offensive weapon the Turks still relied on the bow and arrow. Many Christian soldiers, however, were armed with the arquebus, an early type of musket. The opposing fleets came together in the Gulf of Lepanto (near Patras, Greece) in 1571. This was just a few miles south of where Agrippa had defeated Antony in the Battle of Actium sixteen centuries earlier. In the terrible battle that took place, the Christian navies crushed their Turkish opponents. Some 30,000 Turks died. All but sixty of their ships were captured or destroyed. Some 15,000 Christians captured earlier by the Turks and used as slaves to row the galleys were freed by the victory.	48-50
The Battle of Lepanto	Explain that as a result of the Battle of Lepanto, the Turks never again seriously challenged control of the Mediterranean, although Muslim pirates continued to harass merchantmen on these waters for the next 250 years.	51
Review Question	The Review Question is, “What does Mare Nostrum mean, and why was that term used?” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	52
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	53
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	54

Chapter 1 / Section 1: NS2-M1C1S1 – Sea Power

III. Supplemental Activities -

A. In-Class Activity:

Supplies required: Image of Greek Ship and homework handout

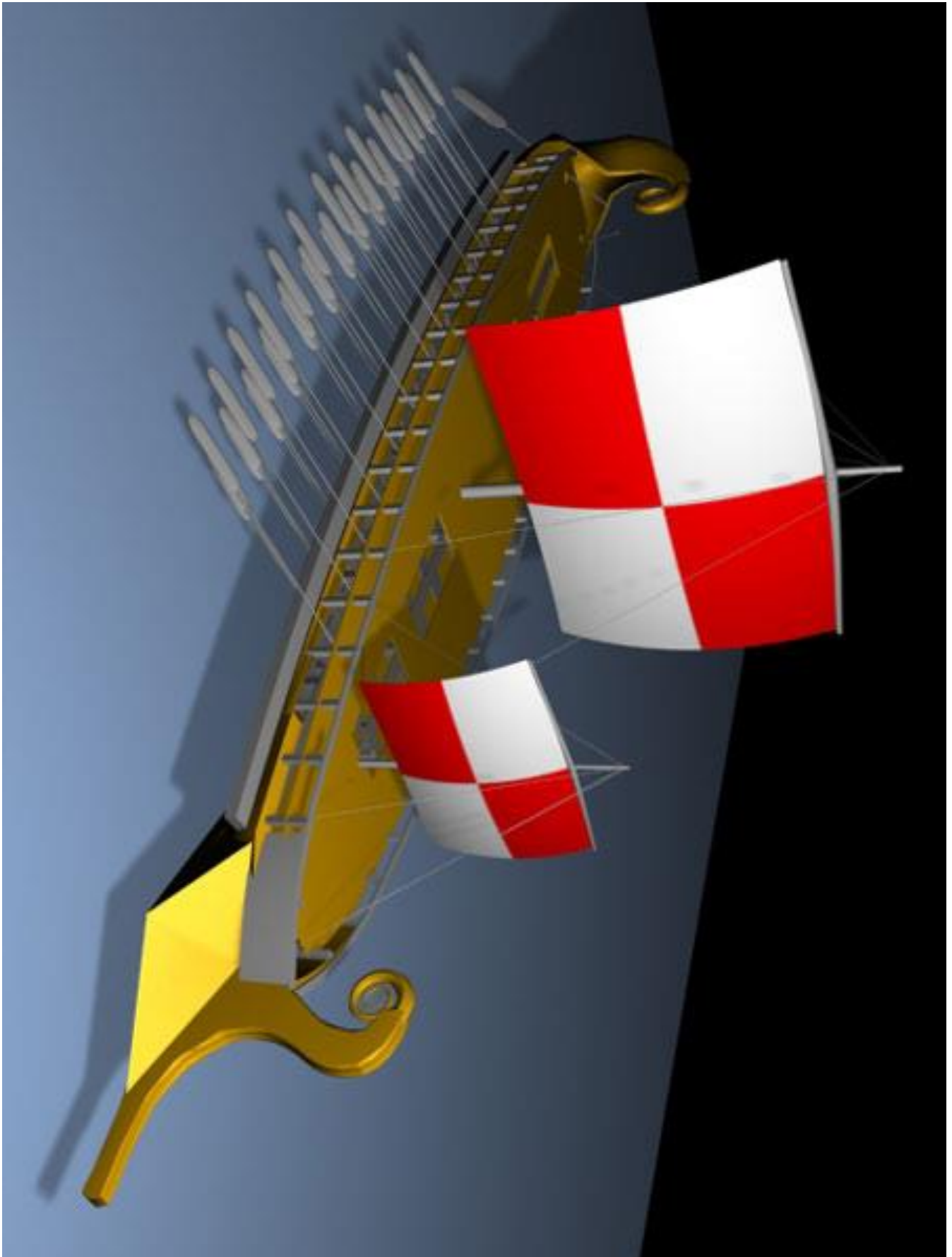
When: Prior to lesson

- In class: Project Image of Greek Ship onto the screen and ask cadets questions about the image such as:
 1. What do you notice?
 2. What do you wonder?
 3. What do you think this is?
 4. Who do you think used this boat?
 5. What was this boat used for? Etc.

Use this conversation as an anticipatory set to the lesson

B. At Home Activity: Use the handout “Guarding against Pirates” Have the cadets research stories about modern day pirates and then write a one page response to the following question: “What measures can countries take today to guard against pirates?”

IV. Evaluation - see CPS database for chapter test questions.



Chapter 1 / Section 1: NS2-M1C1S1 – Sea Power

Activity 1: Take Home Activity- Guarding against Pirates

Name: _____ Date: _____ Class: _____

Directions: Research stories about modern day pirates and write a one page response to the following question: “What measures can countries take today to guard against pirates?”

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Chapter 1 / Section 1: NS2-M1C1S2 – The Age of Discovery

(Section 1 of 2)

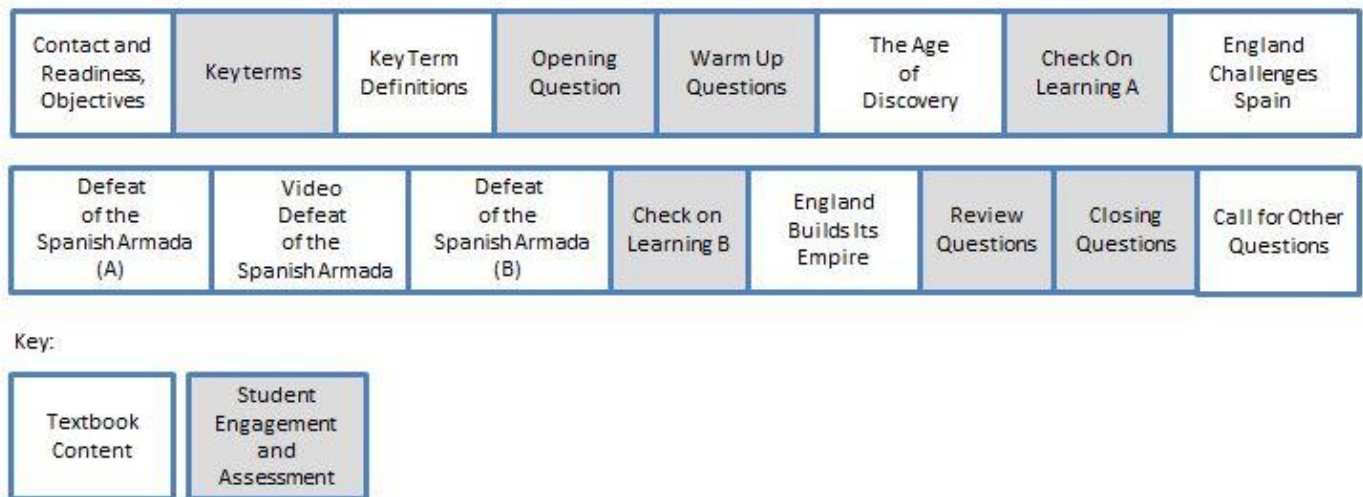
What Students Will Learn to Do:

Demonstrate the knowledge of how sea power influenced the growth of Early Western Civilization

Skills and Knowledge to be Gained:

1. Describe the growth of the world during the Age of Discovery
2. Describe the conflict between England and Spain in 1570
3. Explain how the English defeated the Spanish Armada
4. Describe methods used by England to build her empire in the 17th century

LESSON FLOW OUTLINE



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 1. Place a checkmark beside the NS2-M1C1S2 PowerPoint presentation, and these two CPS question deck files: NS2-M1C1S2 - Key Terms and NS2-M1C1S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 1 / Section 1: NS2-M1C1S2 – The Age of Discovery

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>We will discuss how looking for new trade routes led to the Age of Discovery—a period of exploration and colonization, an age of sea power.</p> <p>We will discuss the lands explored and the countries that settled them; and will talk about the battles between England, Spain, France, and Holland, up until the Treaty of Paris in 1763 when England was supreme and her navy and merchant fleets controlled the world’s seas.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-6
Opening Question(Random Pick a Student – “RPS”)	<p>This Opening Question is, “List 2-3 reasons that early colonies sprang up near the sea.” Since this is a discussion question, it can be engaged using the RPS function where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on sea power and the early western civilization.</p>	7
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	8
The Age of Discovery	Explain that the Age of Discovery was a new age of sea power. Brave explorers in wooden ships sailed the world’s oceans and founded colonies while seeking religious freedom and fortunes for king and country. The hardships were great, but the lure of gold and adventure was greater. As before, the nations with sea power became rich and powerful. Inevitably, rivalries arose and wars were fought between opposing great powers.	9
The Age of Discovery	Explain that the Portuguese were the first to seek a new sea route to the East Indies and the rest of Asia. Prince Henry the Navigator hired explorers to try to find a route to the East by sailing around Africa. Bartolomeu Dias rounded the Cape of Good Hope at the southern tip of Africa in 1488. This proved that a sea route to Asia existed. Vasco da Gama sailed from Portugal to India in 1498, opening a Portuguese trade route to the Indies and China and establishing colonial trading sites. Portugal’s leadership was brief, though, for it was soon overwhelmed by neighboring Spain.	10-13

Chapter 1 / Section 1: NS2-M1C1S2 – The Age of Discovery

The Age of Discovery	Explain that Queen Isabella financed Christopher Columbus on his first voyage of discovery by contributing about \$5,000 in royal jewels. It certainly was the most profitable investment in history. Columbus landed in America and thus helped put Spain into a position of European leadership. Through sea power, Spain established a huge empire. Millions in gold, silver, and jewels poured into the royal treasury. Treasure-laden ships sailed in groups escorted by warships to protect them against pirates and privateers of rival nations. This was an early example of a convoy, a method used centuries later in World Wars I and II to protect merchant shipping.	14-19
The Age of Discovery	Explain that at the time, national wealth was thought to be measured by the amount of treasure in the royal vaults. The total wealth of the world was considered to be a fixed quantity. Thus, to become richer and more powerful, a nation had to make another nation poorer through capture of its trade and colonies. This mercantile theory kept the world in almost continuous conflict well into the 1800s.	20
Check on Learning Questions A(Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	21
England Challenges Spain	Explain that in 1570, Pope Pius V called upon King Philip II of Spain to drive the Muslims from Europe and the Mediterranean. At the same time, the Pope asked Philip to crusade against Queen Elizabeth I, "heretic and usurper" in Protestant England. Having proved himself and his great fleet at Lepanto, Philip accepted this task.	22
England Challenges Spain	Explain that Elizabeth, on the other hand, wanted to protect her throne against the Catholic Mary Queen of Scots. She began to strengthen England's defenses against the attack she knew would soon come from Spain. After securing England's flank by an alliance with the king of France, she secretly released her fortune-seeking seamen to raid Philip's treasure ships from the New World, a practice called "privateering." And she began rebuilding her navy.	23
England Challenges Spain	Explain that the privateering of the English "seadogs"—Sir Francis Drake, Martin Frobisher, and Sir John Hawkins—was extremely successful and pleased the queen. In 1578, Sir Francis Drake, the most famous of the English raiders, sailed his <i>Golden Hind</i> into the Pacific through the Strait of Magellan and raided Spanish cities and shipping along the west coast of South America. He returned to England in 1581 via the Cape of Good Hope, laden with gold, silver, and jewels worth half a million pounds sterling (equal to many millions of today's dollars). Queen Elizabeth accepted the treasure and knighted Drake on the quarterdeck of his ship.	24-26
England Challenges Spain	Explain that Elizabeth had a significant advantage in her superb seamen. The widespread privateering had created a group of men who had great knowledge of ships and the sea. With these seadogs in command of the world's best sailors, England prepared to meet Spain in a great contest for supremacy on the seas.	27
Defeat of the Spanish Armada	Explain that in the early summer of 1588, Philip sent forth what he believed to be an unbeatable naval armada. Its purpose was to stop the English raids on his ships and ports and to bring England back into the Catholic Church. The Spanish Armada consisted of a fleet of 124 galleons with 1,100 guns. It was manned by 8,000 sailors and carried 19,000 soldiers, all under the command of the Duke of Medina-Sidonia. Explain that to oppose it, the English had reinforced the queen's 34 men-of-war with 163 armed merchantmen, 16,000 men, and 2,000 guns. The English fleet was under the overall command of Charles Howard, Lord Admiral of England.	28-30

Chapter 1 / Section 1: NS2-M1C1S2 – The Age of Discovery

Defeat of the Spanish Armada	Explain that the scene was set. The Armada had fewer guns, but had superior total firepower. The English had smaller ships and long-range culverins (a type of cannon). The English had an advantage in maneuverability, clear decks, and range. King Philip's orders were to "grapple and board and engage hand to hand." But the English intended to fight with guns alone, for they carried fewer soldiers. The sailors and marines doubled as antiboarding defenders and cannoneers.	31
Defeat of the Spanish Armada	Explain that during their first encounters in the English Channel, each side used more than 100,000 rounds of shot. Spanish fire had little effect because of the distance kept by the English ships. The English pounded the Spanish ships, causing many casualties on the packed decks but little damage to the hulls.	32
Defeat of the Spanish Armada	Explain that ignoring a chance to attack the English off the coast of Plymouth, the Spaniards sailed on up the channel. The English picked away at them with little effect. But by the time Medina-Sidonia sought rest and resupply in the neutral French port of Calais, he found that he had fired all of his heavy shot. During the night, Howard sent eight fire ships into the Spanish ships anchored at Calais, forcing the Spaniards out in confusion during darkness. The next day the English and their Dutch allies attacked without fear of the now-silent Spanish guns, facing only the small border-repellers and muskets.	33
Defeat of the Spanish Armada	Explain that if the English ammunition had held out, they probably would have crushed the Spanish Armada then and there. As it was, hunger and thirst, storms, and poor navigation finished the task for the English. About forty of the Spanish ships sank at sea and at least twenty were wrecked on the rocky shores of Scotland and Ireland. In October, only about half of the great naval force that Philip had confidently sent to conquer England returned to Spain.	34
Video of the Defeat of the Spanish Armada	Show Video of the defeat of the Spanish Armada	35
Defeat of the Spanish Armada	Explain that the failure of the Armada marked the beginning of Spain's decline. The defeat of the Armada was a signal to seafaring nations, especially England, France, and the Netherlands, to strike out for colonies and commerce around the world. The fact that these efforts often involved taking over territories and trade routes claimed by the king of Spain made little difference to the mariners. They did not attempt to conquer Spanish colonies in Central and South America. But pirates and privateers often plundered the Spanish Main. This stretched from Colombia and Panama to the islands in the Caribbean. Asia, Africa, and North America east of the Mississippi River were considered wide open for colonization and trade.	36
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	37
England Builds Its Empire	Explain that England's efforts at colonization in the seventeenth century were financed by private groups who received charters (licenses) for that purpose from the Crown. The first successful colony in North America was founded in 1607 at Jamestown, Virginia. Later colonies in Massachusetts, Pennsylvania, and Maryland were begun by groups seeking religious freedom. The last colony on the East Coast was Georgia (1732), whose settlers volunteered as a way to get out of debtors' prisons.	38-40

Chapter 1 / Section 1: NS2-M1C1S2 – The Age of Discovery

England Builds Its Empire	Explain that the English, French, and Dutch were eagerly seeking colonies and conflict was inevitable. Between 1665 and 1674, the English and Dutch fought three fierce naval wars. The English were the winners, and one of their gains was the Dutch colony of New Amsterdam. The English soon renamed the colony <i>New York</i> . Between 1689 and 1763, the English fought a series of wars with the French, now their only serious rival at sea. During the Seven Years’ War (1756–63), known in America as the French and Indian War, the two powers fought what amounted to a world war. Land and sea battles occurred in almost every part of the globe. England’s ultimate victory gained her many new possessions, the main possession in North America being Canada.	41-42
England Builds Its Empire	Explain that whatever may have been happening among the superpowers throughout this period of nearly two centuries, the colonies existing on a thin strip of cultivated land on the East Coast of North America did so only because of the sea. It was across the Atlantic Ocean that all of the settlers had come, bringing with them only the bare necessities of life and their Old World traditions. It was across this same ocean that additional colonists, livestock, and hardware came to sustain and expand what the hardy first folk had begun.	43
England Builds Its Empire	Explain that the sea provided them with an industry, particularly in New England, where they soon discovered some of the richest fishing grounds in the world. Virginians used the sea to send large quantities of tobacco to the Old World, which had taken an almost instant liking to it. Within and among the colonies, the inland rivers and coastal waters became waterborne highways. On these highways the products of inland regions were traded for imported goods and sent on their way to the larger coastal communities and then overseas, primarily to England.	44
England Builds Its Empire	Explain that by 1760, born of the sea, maintained by the sea, and enriched by the sea, England’s American colonies had grown in population to more than 1.5 million people. By 1775, they had grown to 2.5 million. American seamen and American-built ships made up about one-third of the entire English merchant marine. Explain that with the Treaty of Paris in 1763, the war in North America between France and England ended. England was supreme, and its navy and merchant fleets controlled the world’s seas.	45-46
England Builds Its Empire	<div>Chronology</div> <div><div>2500-1200 B.C.</div><div>1200 B.C.</div><div>480 B.C.</div><div>275 B.C.</div><div>31 B.C.</div><div>476</div><div>1095</div><div>1492</div><div>1571</div><div>1588</div><div>1607</div><div>1756-63</div><div>Crete dominates Mediterranean</div><div>Trojan War</div><div>Battle of Salamis</div><div>Rome conquers Italy</div><div>Battle of Actium</div><div>Last Roman emperor deposed</div><div>First Crusade</div><div>Columbus discovers America</div><div>Battle of Lepanto</div><div>Spanish Armada defeated</div><div>Jamestown colony established</div><div>French and Indian War</div></div>	47-48
Review Question	The Review Question is “Describe the mercantile theory and its proponents during the Age of Discovery in Europe.” Question is designed to provide opportunities for reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to encourage discussion.	49

Chapter 1 / Section 1: NS2-M1C1S2 – The Age of Discovery

Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	50
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	51

III. Supplemental Activities –

A. In Class Activity:

Supplies required: Handout for homework activity

When: The in class activity should take place prior to the lesson to encourage cadets to think about exploration and discovery.

- In Class: Set the lesson by having a discussion with these anticipatory questions:
 - What do you think was discovered during the “Age of Discovery”?
 - Who do you think were the “discoverers”?
 - What are reasons that humans many have for exploration during this time period? (Curiosity, fame, national pride, new products, trade routes, religion, fame, etc.)

B. Take Home Activity: Copy and distribute the “mural activity” handout. Tell the cadets, “You have been commissioned to paint a mural depicting the Age of Discovery. What images would you included and what do they symbolize? Include at least 10 images in your mural.”



Tech Tip: Project and discuss murals that can be found online highlighting symbolism and theme.

- Space
- Martin Luther King
- Peace

IV. Evaluation - see CPS database for chapter test questions.

Chapter 1 / Section 1: NS2-M1C1S2 – The Age of Discovery

Activity 1: Take Home Activity- Mural Activity

Name: _____ Date: _____ Class: _____

You have been commissioned to paint a mural depicting the Age of Discovery. What images would you included and what do they symbolize? Include at least 10 images in your mural.

Image	Is a Symbol of ...	It is included because...

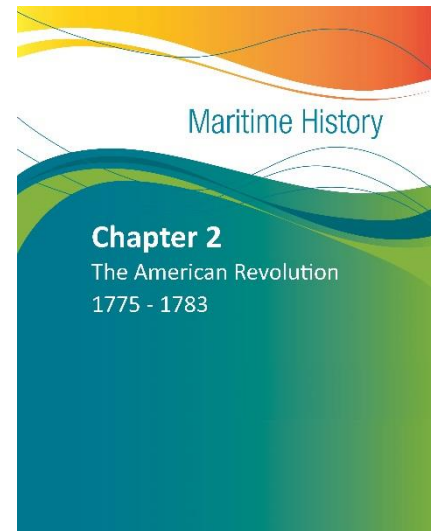
Module 1 Chapter 2: NS2M1C2 – The American Revolution 1775-1783

What Students Will Learn to Do:

Demonstrate an understanding of how sea power influenced the growth of The American Revolution, 1775 – 1783

Skills and Knowledge to be Gained:

1. Describe the taxing system used by England on the colonies and the subsequent events that led to the American Revolution
2. Explain the difficulties the British faced in fighting naval battles with the colonies
3. Describe how the American Navy was born and the significance of building the Navy
4. Cite the importance of the first American Naval operation against the English Navy in the American Revolution
5. Explain the strategy General Benedict Arnold used at the battle of Lake Champlain and the significance of the battle
6. Describe the tactics General George Washington used to save the colonial capital at Philadelphia
7. Describe the failure of the British three-pronged plan during the Crucial Year of 1777
8. Describe the two major events (turning point) of the battle of Saratoga and the impact it had on the American Revolutionary War
9. Explain how naval power affected the outcome of the War at Sea
10. Explain France's role in the Closing Campaigns of the war
11. Describe the events leading up to the battle of Yorktown and the subsequent end of the fighting in the colonies



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.3. Analyze how the author unfolds an analysis or series of ideas or events...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...
- RI.9-10.7. Analyze various accounts of a subject told in different mediums ...

Writing

- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.9-10.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem...
- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions ...

Module 1 Chapter 2: NS2M1C2 – The American Revolution 1775-1783

Language

- L.9-10.3. Apply knowledge of language to understand how language functions in different contexts...
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Civic and Political Institutions

- D2.Civ.14.9-12. Analyze historical, contemporary, and emerging means of changing societies, promoting the common good, and protecting rights.

Dimension 2. Geography

- D2.Geo.10.9-12. Evaluate how changes in the environmental and cultural characteristics of a place or region influence spatial patterns of trade and land use.
- D2.Geo.11.9-12. Evaluate how economic globalization and the expanding use of scarce resources contribute to conflict and cooperation within and among countries.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...
- D2.His.14.9-12. Analyze multiple and complex causes and effects of events in the past.
- D2.His.16.9-12. Integrate evidence from multiple relevant historical sources and interpretations into a reasoned argument about the past.

Dimension 4. Communicating Conclusions and Taking Informed Action

- D4.2.9-12. Construct explanations using sound reasoning, correct sequence ...examples, and details with significant and pertinent information and data...
- D4.6.9-12. Use disciplinary and interdisciplinary lenses to understand the characteristics and causes of local, regional, and global problems...
- D4.7.9-12. Assess options for individual and collective action to address local, regional, and global problems...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 2 / Section 1: NS2-M1C2S1 – Prelude to Revolution

(Section 1 of 2)

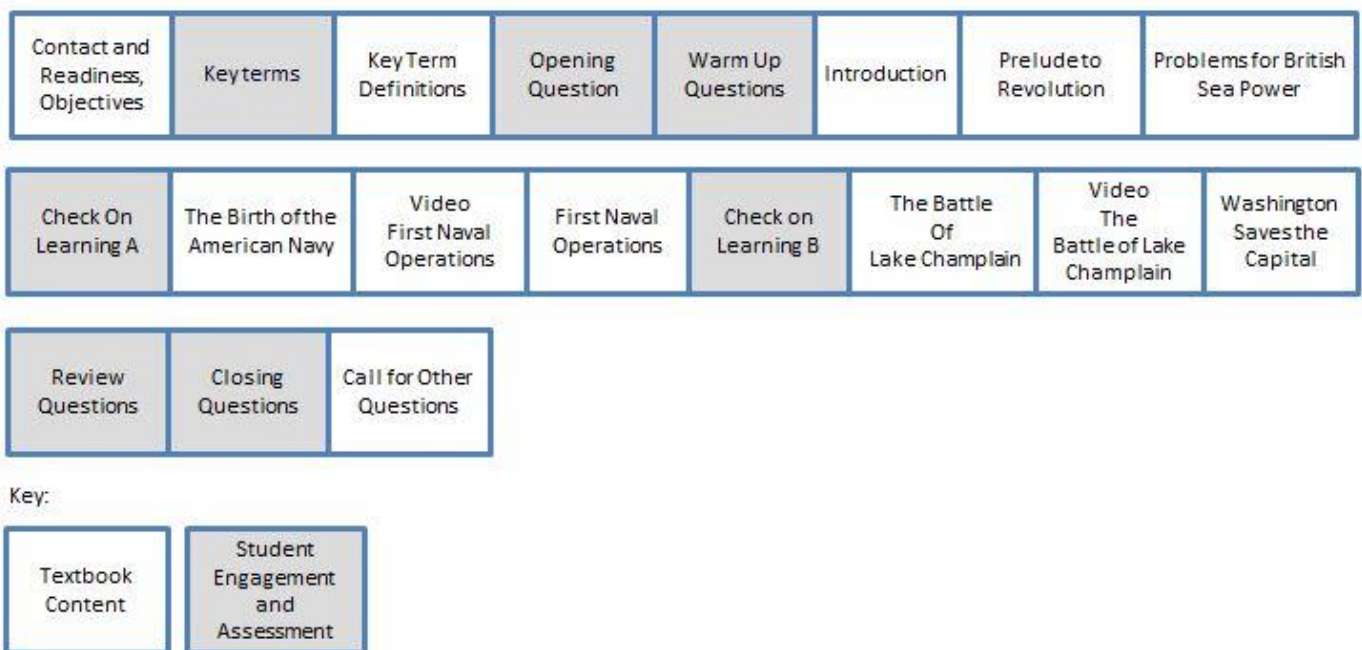
What Students Will Learn to Do:

Demonstrate an understanding of how sea power influenced the growth of The American Revolution, 1775 – 1783

Skills and Knowledge to be Gained:

1. Describe the taxing system used by England on the colonies and the subsequent events that led to the American Revolution
2. Explain the difficulties the British faced in fighting naval battles with the colonies
3. Describe how the American Navy was born and the significance of building the Navy
4. Cite the importance of the first American Naval operation against the English Navy in the American Revolution
5. Explain the strategy General Benedict Arnold used at the battle of Lake Champlain and the significance of the battle
6. Describe the tactics General George Washington used to save the colonial capital at Philadelphia

LESSON FLOW OUTLINE



Chapter 2 / Section 1: NS2-M1C2S1 – Prelude to Revolution

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 2. Place a checkmark beside the NS2-M1C2S1 PowerPoint presentation, and these two CPS question deck files:
NS2-M1C2S1 U1C1S1 - Key Terms and NS2-M1C2S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will discuss how the growth of the American Navy impacted the results of the Revolutionary War. We will also discuss the events of this period of time and the crucial factors that gave birth to a new nation. As we look at the colonies' first naval operation we will see how it contributed to the rise of great naval heroes like John Paul Jones and why the Navy was important to the American cause. We will look at some great American naval heroes and some of their battles. We will discuss the battle tactics used by General Benedict Arnold and General George Washington and the resulting victories.</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-7
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "Why do you think the Colonists resented taxation by the British government?" Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on the prelude to the revolution.	8
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	9

Chapter 2 / Section 1: NS2-M1C2S1 – Prelude to Revolution

Introduction	Explain that the Seven Years’ War was fought from 1756 to 1763. During this war, Britain captured French and Spanish colonial possessions around the world, mainly because of its superior naval strength. Chief among these possessions were Canada and Florida in North America and India in Asia.	10
Introduction	Explain that England’s prime minister during these years, William Pitt, planned the naval strategies that made it possible for England to conquer half the world by the war’s end. The Prime Ministers after Pitt, however, allowed the Royal Navy to decline somewhat in the years after the war. On the other hand, France began to rebuild its Navy immediately.	11
Prelude to Revolution	Explain that while England and France were busy fighting each other in the Seven Years’ War, the American colonies grew and prospered. When the war was over, British officials looked to the colonies as a way to raise money to help pay off the debts built up during the long war. They felt the colonies had benefited unfairly. They believed that, unlike Englishmen at home, the colonists had not borne their share of the taxes and restrictions. England thus passed the Revenue Act and began enforcing taxes on sugar imports to the colonies in 1763. Then, by the Stamp Act of 1765 and other similar acts, it tried to reassert Parliament’s power in the colonies. The colonists thought this treatment was unfair and soon became upset over the way Britain was exerting its power over them.	12-13
Prelude to Revolution	Explain that in 1767, Parliament passed the Townshend Act, which taxed paper, lead, and tea. Throughout the colonies people protested. Anti-British feelings were especially strong in Boston. There, on the evening of 5 March 1770, an angry crowd of protesters including an African American named Crispus Attucks gathered and began to taunt British soldiers. The situation quickly escalated, and in a scuffle that followed, the soldiers shot and killed Attucks and several other people—considered the first casualties of the American Revolution. The incident was played up in the press and soon became known as the “Boston Massacre.” The incident caused many colonists to want to seek revenge.	14
Prelude to Revolution	Explain that three years later, irate Bostonians disguised as warlike Indians boarded a merchant ship and dumped some British tea into the harbor rather than pay taxes due on it. Parliament soon responded to this “Boston Tea Party” with the Coercive Acts, which closed the port of Boston, abolished the right of the people of Massachusetts to select their own council, and restricted other civil liberties. Explain that these were the some of the events that led to the American Revolution, which began at Lexington and Concord in April 1775. “The die is cast,” wrote King George III. “The colonies must either triumph or submit.” There was no longer the possibility of a peaceful settlement.	15-16
Problems for British Sea Power	Explain that the Royal Navy, in 1775, the mightiest in the world, soon found out that it would not be easy to fight the Americans. For one thing, the British had been getting much of their shipbuilding materials, such as tar, pitch, turpentine, and timber for masts and hulls, from the colonies. Now, of course, the colonies would not supply these materials to England. The British also soon found that many officers in the British Army and Navy believed the Americans were English citizens and refused to fight against them.	17
Problems for British Sea Power	Explain that another force that had earlier been on England’s side was now turned against it- the privateers, the armed American merchant ships that had helped the British win the French and Indian War. Now these privateersmen, with the blessing of the Continental Congress, set out to capture British ships and goods.	18

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Problems for British Sea Power	Explain that the 1,800-mile-long American coast presented a big problem for the British. How could they defend their merchant ships from privateers in English waters, patrol the American coastline to keep ships from supplying the colonies with arms and other goods, and at the same time supply British land troops with the weapons and other things they needed?	19
Check on Learning Questions A(Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	20
The Birth of the American Navy	Explain that in July 1775, the Continental Congress petitioned King George III to restore liberty to the colonies in a final attempt to avoid war with England. Despite the difficulties facing the British, the king refused to accept the petition, and the colonists knew that they must prepare for war.	21
The Birth of the American Navy	Explain that George Washington, who had been a British Colonial Officer in the French and Indian War, had taken command of the Continental Army surrounding Boston on 3 July 1775. Washington knew he could not wage war without a Navy. "Whatever efforts are made by land armies, the Navy must have the casting vote in the present conflict," he said.	22
The Birth of the American Navy	Explain that just the month before Washington had taken command, a group of Maine backwoodsmen under Jeremiah O'Brien won the first real sea fight of the Revolution. The Patriots captured a small British merchant sloop, and then they used her to capture the British armed cutter <i>Margaretta</i> and all the supplies the ship was taking to British troops in New England.	23
The Birth of the American Navy	Explain that this action was similar to most of the naval warfare done by the colonies throughout the war. Every colony except New Hampshire commissioned ships, and Virginia and South Carolina had fairly large squadrons. Nearly all of these ships were small. They operated all along the Atlantic seaboard, in river mouths, bays, and coves. They carried on coastal commerce and attacked British supply boats and parties whenever the opportunities and odds were favorable. But most important, they kept open the coastal lines of communication on which so much of the life in the colonies depended.	24
The Birth of the American Navy	Explain that partly because of this "coastal cavalry" force, the Continental Congress was reluctant to establish a Navy. Many representatives thought that no warships built and manned by colonists would be able to stand up to the powerful ships of the Royal Navy. Still, the colonies needed supplies to wage war, and capturing them from British ships was a good way to get them. When Congress learned that two unescorted transport ships loaded with supplies for the British army in Quebec had sailed from England, it decided that the time had come to launch the Continental Navy.	25
The Birth of the American Navy	Explain that on 13 October 1775 the Continental Congress took the step that the U.S. Navy regards as its official birth. It approved a plan for buying, fitting out, and arming two vessels, the <i>Andrew Doria</i> and the <i>Cabot</i> , to intercept the British supply ships. Two larger ships, the <i>Alfred</i> and the <i>Columbus</i> , soon were added. These ships were not only to attack British transports but also to protect and defend the colonies.	26

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The Birth of the American Navy	Explain that the Continental Congress quickly enlarged its Navy even more. New men-of-war were built, and merchant vessels were converted into fighting ships. Privateers also helped. They captured some 2,200 British vessels by war's end. After the war, many privateer captains became famous in the U.S. Navy.	27
The Birth of the American Navy	<p>Explain that George Washington himself commissioned seven ships to capture some of the supplies that were streaming in to the British troops in Boston. In November 1775 his "Navy" captured muskets, shot, and a huge mortar, which Washington's poorly armed forces desperately needed, from the British ships.</p> <p>Explain that on 10 November 1775, the Continental Congress established a Marine Corps of two battalions. These men helped equip the new Navy. The Marine Corps still celebrates this date as its birthday.</p>	28
The Birth of the American Navy	Explain that in the early days of the Revolution, men were eager to serve in the Continental Navy. As the war continued, however, recruiting them became more difficult, due to a combination of stricter discipline, low pay, and the rewards that could be obtained by privateering. Sometimes, the Continental authorities even resorted to the practice of impressment to crew the ships; men were forced to serve by taking them on board against their will. Finding men to serve in the Continental Navy was a problem throughout the war, and ships were often unable to go to sea because they lacked crews.	29
Video on First Naval Operations	Show video on first Naval Operations.	30
First Naval Operations	Explain that the first Continental Naval Squadron was composed of six small schooners, brigs, and sloops donated by several states and assembled at Philadelphia. They were placed under the command of Esek Hopkins, a Rhode Islander. On 22 December 1775, the first American Naval flag was raised on one of them, the <i>Alfred</i> , by the Senior Lieutenant in the Continental Navy, John Paul Jones.	31
First Naval Operations	Explain that in February 1776, Congress directed Hopkins to take his squadron to the Virginia Capes to neutralize any loyalist craft he might find there. But in keeping with his independent New England spirit, once at sea, Hopkins decided to go after bigger game. He sailed straight for New Providence (later Nassau) in the Bahamas, where he was able to overcome two British forts and take more than eighty artillery pieces, powder, and naval stores.	32
First Naval Operations	Explain that on their way home, the squadron captured several British ships loaded with more British arms, which they took to Washington's troops as well. The expedition was not without casualties, however. Just after midnight on 5 April, the squadron happened upon the twenty-gun British corvette <i>Glasgow</i> off New England. After damaging many of the squadron's ships, the <i>Glasgow</i> escaped, even though she was outnumbered six to one.	33
First Naval Operations	Explain that this incident showed in many ways what kind of Navy the Continental Congress had gathered. For the most part, the Squadron Captains were privateersmen who could not cooperate with each other, teach their men gunnery, or maintain squadron discipline. One of the Captains, Tom Hazard of the sloop <i>Providence</i> , was	34

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	<p>dismissed for cowardice, and his ship was given to Lieutenant Jones.</p> <p>Explain that with his sloop the <i>Providence</i>, in a single month, August 1776, Lieutenant John Paul Jones captured sixteen enemy vessels and destroyed many others. Later, as Captain of the makeshift frigate Alfred, Jones cruised off the New England coast and raided enemy shipping and fishing in that area. One of the ships he captured carried British winter uniforms, and soon 10,000 American soldiers were wearing them. John Paul Jones would become legendary among early American naval leaders.</p>	
First Naval Operations	Explain that a few weeks later, when Hopkins took the squadron south to Providence, Rhode Island, troubles began to multiply. Several of the ships began to break down, an epidemic of smallpox sent a hundred men ashore, and General Washington wanted another hundred men he had loaned to the squadron returned. There was no money to pay those who were left. It was nearly impossible to recruit men for such duty, when the crews of the coastal privateersmen got better shares of the prizes they captured plus quick payoffs for their efforts.	35
First Naval Operations	Explain that the Nassau expedition turned out to be the last time American ships would put to sea as a squadron during the war. Later, various officers who had been in the squadron set out by themselves in their ships and took on many British ships in hard-fought individual actions.	36
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	37
The Battle of Lake Champlain	Explain that in the fall of 1775, the American Patriots under General Benedict Arnold attacked Quebec in Canada, but they could not capture the city. The Americans stayed and bombarded the city through the winter. In the spring, when the ice melted on the St. Lawrence River, British reinforcements arrived by ship, forcing the Patriots to retreat toward the colonies. The British, under Generals Sir Guy Carleton and John Burgoyne, pursued them.	38-39
Video on the Battle of Lake Champlain	Show video on the Battle of Lake Champlain	40
The Battle of Lake Champlain	Explain that meanwhile, the Second Continental Congress had signed the Declaration of Independence on 4 July 1776, making the colonists' rebellion a revolution. The Patriots were more determined than ever to be free from British rule.	41
Washington Saves the Capital	Explain that while General Arnold was fighting the British on Lake Champlain, farther east things were not going well. The British General Sir William Howe held the city of Boston. The Americans placed cannon on Dorchester Heights overlooking the city in March 1776, but the colonial militia did not have enough gunpowder to engage Howe's troops and enter the city. Also, the Continental Naval forces there were not large enough to stop the British from evacuating by sea. Thus, Howe's troops and 1,000 loyalists escaped in ships to Halifax, Nova Scotia, to await reinforcements.	42
Washington Saves the Capital	Explain that after the reinforcements arrived, General Howe sailed south from Nova Scotia with the main British army to join British generals Sir Henry Clinton and Charles Cornwallis at New York on 5 July, the day after the Declaration of Independence was signed. Five hundred British ships anchored off Staten Island. The Americans did not have a single warship, and the few small craft they had could not keep the enemy out of New York. Altogether, the British landed more than 30,000 well-equipped and well-	43

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	trained troops. Washington's opposing troops numbered only about 20,000, and many of them were untrained militiamen.	
Washington Saves the Capital	Explain that by late fall, General Howe's superior forces had driven the Patriots from Long Island and then from White Plains, New York. General Washington's army fled again and again before the advancing British. By December 1776 the American forces were reduced to only about 2,000 men because of casualties and desertion, and also because most of those whose enlistments had run out, went home to take care of their families for the winter.	44
Washington Saves the Capital	Explain that Washington and his remaining troops were cold, hungry, and tired. They badly needed a victory to regain the momentum and sustain the revolution. As his men crossed the Delaware River to escape the enemy yet again in late December, Washington devised a bold plan. He ordered his men to take all boats from the New Jersey side of the river to the Pennsylvania side. Then, on Christmas night, in a raging sleet storm, the nearly frozen American soldiers quietly rowed through the ice floes on the river back to the New Jersey shore. Their surprise attack on the enemy troops, (Hessian soldiers who were German mercenaries) at Trenton was a huge success. One week later, Washington surprised the British again, this time at Princeton, and his men won another complete victory.	45
Washington Saves the Capital	Explain that the British then returned to New York for the winter, while Washington and his troops wintered in Morristown, New Jersey. They had saved the colonial capital at Philadelphia from the enemy, but more important, the tide was turning. The Patriots would be ready to fight again with the coming of spring.	46-47
Review Question	The Review Question is, "List 2-3 of the disadvantages that the colonist armies faced as compared to the British armies." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	48
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	49
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	50

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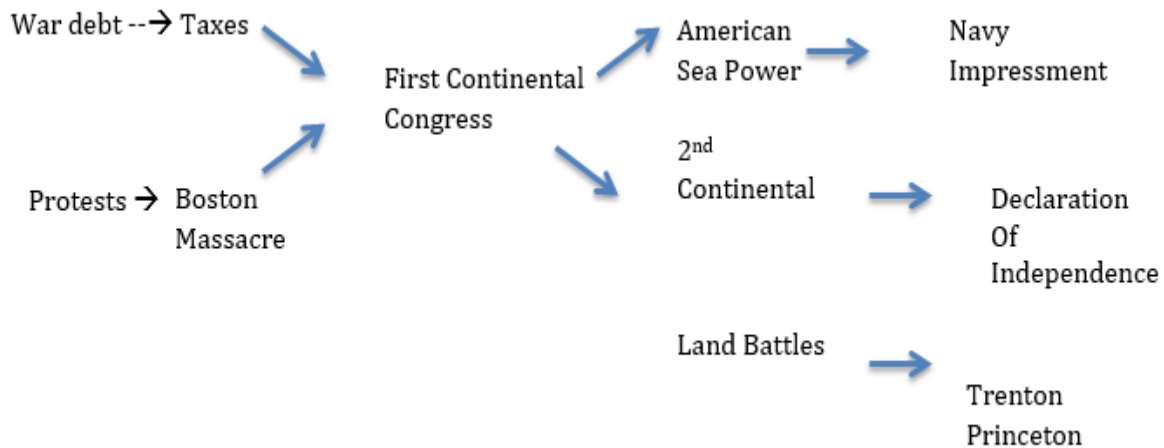
III. Supplemental Activities -

A. In Class Activity:

Supplies required: “Thinking Map” handout

When: In class activity will take place during the presentation of NS2-M1C2S1 Notes.

- In Class: As cadets view the presentation, they will complete the Cause and Effect Thinking Map handout. More boxes may be added if needed. The thinking map may look something like this:



B. At Home Activity: Copy and distribute the “Analyzing a Political Cartoon” handout. Have the cadets complete the questions using the American Revolution cartoon.

Here is a link to a [website](#) that has many other American Revolution cartoons and analysis questions.

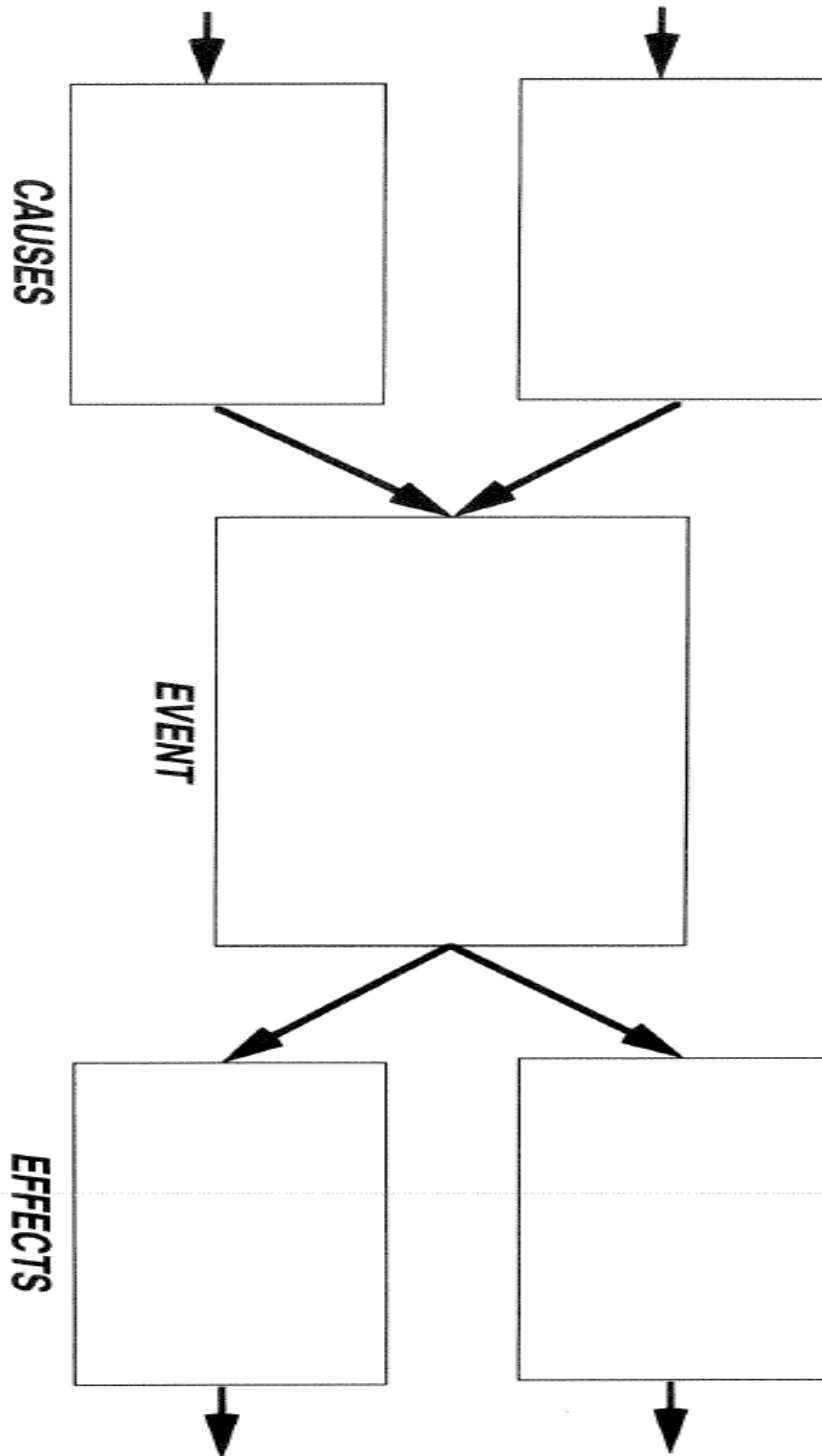
IV. Evaluation - see CPS database for chapter test questions.

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Activity 1: In-Class Activity – Thinking Map Activity

Name: _____ Date: _____ Class: _____

Directions: Complete the Cause and Effect Thinking Map. You can add more if needed.



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Activity 1: At Home Activity – Analyzing a Political Cartoon

Name: _____ Date: _____ Class: _____

Directions answer the questions about the political cartoon.



1. Describe the action taking place in the cartoon.
2. Does the cartoon have a caption? Does the caption help explain the meaning of the cartoon?

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3. What are the people in the cartoon doing? What can you tell from the expressions on their faces?

4. Do you see any symbols in the cartoon? If so, what are they?

5. Why do you think these symbols were used in the cartoon?

6. What do these symbols mean?

7. What is pictured in the background of the cartoon?

8. How do you think this cartoon affected viewers during the time period in which it was published?

Chapter 2 / Section 2: NS2-M1C2S2 – The Crucial Year 1777

(Section 2 of 2)

What Students Will Learn to Do:

Demonstrate an understanding of how sea power influenced the growth of the American Revolution, 1775 – 1783

Skills and Knowledge to be Gained:

1. Describe the failure of the British three-pronged plan during the Crucial Year of 1777
2. Describe the two major events (turning point) of the battle of Saratoga and the impact it had on the American Revolutionary War
3. Explain how naval power affected the outcome of the War at Sea
4. Explain France's role in the Closing Campaigns of the war
5. Describe the events leading up to the battle of Yorktown and the subsequent end of the fighting in the colonies

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Video The Crucial Year: 1777	The Crucial Year: 1777	The Turning Point: The Battle of Saratoga
Check On Learning A	The War at Sea (A)	Video The War at Sea #1	The War at Sea (B)	Video The War at Sea #2	The Closing Campaigns	Check on Learning B	The Battle of Yorktown
Battle of Yorktown-Aftermath	Review Questions	Closing Questions	Call for Other Questions				

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 2 / Section 2: NS2-M1C2S2 – The Crucial Year 1777

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 2. Place a checkmark beside the NS2-M1C2S2 PowerPoint presentation, and these two CPS question deck files: NS2-M1C2S2 - Key Terms and NS2-M1C2S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will talk about the British three-pronged plan of attack and learn why it failed. The Battle of Saratoga marked the turning point of the war. We will discuss what events caused the tide to turn for the Americans and why they were important. Finally, we will talk about the events leading up to the Battle of Yorktown and the subsequent end to fighting in the colonies.</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-8
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “What do you think kept the colonial soldiers going when the war was not going their way?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the crucial year 1777 in the American revolution.	9
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	10

Chapter 2 / Section 2: NS2-M1C2S2 – The Crucial Year 1777

Video on the Crucial Year: 1777	Show video on the crucial year, 1777	11
The Crucial Year: 1777	Explain that British forces poured across the Atlantic into America during the winter, spring, and early summer of 1777. The British prepared to use the same three-pronged plan of attack that had failed the year before because of the delays caused by the naval operations on Lake Champlain. General Burgoyne would move south from Montreal with 8,000 men to the Hudson Valley. An army of pro-British Tories and the Indians would advance eastward from Lake Ontario. The main army, commanded by Howe, would march north from New York City. The three forces were to meet in Albany, New York, after destroying all Patriot forces in their paths, thus splitting the colonies in half.	12
The Crucial Year: 1777	Explain that Burgoyne moved south and recaptured Fort Ticonderoga in early July, but in late August Patriot militia beat the Tories and Indians near Fort Stanwix. It's possible the plan would have worked if Howe had proceeded according to plan. But he decided to take Philadelphia en route to meeting Burgoyne at Albany.	13
The Crucial Year: 1777	Explain that on 25 August 1777 Howe landed 15,000 men on the shores of the Chesapeake Bay about 50 miles south of Philadelphia. Howe's use of water transport had kept Washington guessing about his intentions for two months. When he finally received word that Howe's armada of 260 ships had entered the Chesapeake, Washington quickly moved most of his army south of Philadelphia to Brandywine Creek. The Americans were no match for the superior British forces, and after a two-day battle on 10 and 11 September, the British marched in triumph into Philadelphia as the Continental Congress fled.	14
The Crucial Year: 1777	Explain that Howe then quartered his army comfortably in Philadelphia for the winter, while Washington's men faced terrible cold and hunger at Valley Forge, northwest of the city. However, as events unfolded, although Howe had taken Philadelphia, by not following the British plan he contributed to the eventual defeat of the British in the colonies.	15
The Turning Point: The Battle of Saratoga	Explain that almost in desperation, on 19 September Burgoyne marched his men European-style through an open field to try to break through the American lines near Saratoga, New York. They made easy targets for American sharpshooters, who were firing from behind trees. When the British retreated, the Americans followed, only to be driven back by British bayonets. The two forces took turns advancing and retreating. On 7 October, Burgoyne led his trapped Redcoats in a final attempt to break through American lines. Once more, Daniel Morgan's riflemen mowed them down. The British retreated when General Benedict Arnold led a charge. Burgoyne had lost 1,200 men and was surrounded by a total of 15,000 American militiamen and regulars under Major General Horatio Gates. Burgoyne finally surrendered on 17 October 1777.	16-18
The Turning Point: The Battle of Saratoga	Explain that Saratoga marked the turning point of the war in two ways. First, after Burgoyne's defeat, the British government was less willing to carry on the war. Lord North, England's prime minister, offered to repeal the British tax laws that had caused the war if the Patriots would stop fighting and remain under British rule. But, by now the leaders of the Revolution were dedicated to winning freedom for a new nation.	19

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The Turning Point: The Battle of Saratoga	Explain that even more important, the American victory at Saratoga now brought the French into the war on the American side. A few months after declaring independence, the Continental Congress had sent Benjamin Franklin to France. He tried to convince the French that joining the American cause was the best way for them to take world leadership away from England. After Saratoga, the French finally decided that the Americans had a chance of winning the war, and they signed a treaty of friendship with the former colonies on 6 February 1778. In June, France declared war on England and began actively helping the Patriots win their freedom. A year later Spain joined the war as France's ally, followed by the Netherlands in 1780.	20
Check on Learning Questions A(Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	21
The War at Sea	Explain that American naval efforts in American waters during the war were mostly just a nuisance to Britain. By 1780 only a few of the forty converted merchantmen and thirteen frigates built for the Continental Navy remained in American hands. Though these vessels captured many British ships, they did not affect the outcome of the war. The small naval forces of the coastal states were also largely ineffective, as British ships were able to sail freely up and down the coast throughout most of the war. However, privateering also took away men, ships, and weapons that the Continental Navy could have used. Despite the problems they caused, the privateers did not greatly harm the British war effort.	22
The War at Sea	Explain that Washington had been right when he said that naval power would decide the outcome of the war, but in the end, it was French, not American, naval power that made the difference. Explain that the American naval record in more distant waters, however, was impressive. The tiny Continental Navy and several American naval heroes won glory overseas during the war. The most famous of them was John Paul Jones, who took the war to European waters with inspiring results.	23
Video of the War at Sea #1	Show video of the War at Sea #1	24
The War at Sea	Explain that Jones received command of the new eighteen-gun <i>Ranger</i> in June 1777 and sailed to France. In the spring of 1778 Jones took the <i>Ranger</i> around Britain and Ireland, where he captured HMS <i>Drake</i> and several merchant ships. Explain that one year later, Jones was given command of an old forty-two-gun converted French merchantman, which he renamed the <i>Bonhomme Richard</i> in honor of Benjamin Franklin, who had written Poor Richard's Almanac. In August 1779 Jones sailed in command of a small squadron that included the American frigate <i>Alliance</i> , which carried thirty-six guns, and three smaller French vessels. The Captain of the <i>Alliance</i> was an unpredictable Frenchman named Pierre Landais.	25
Video of the War at Sea #2	Show video of the War at Sea #2	26
The Closing Campaigns	Explain that with France its enemy, Britain could no longer concentrate all its efforts in the colonies. The British were now determined to stand on the defensive in the north, mount an offensive in the south, and take the war to the West Indies.	27-28

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	<p>Explain that Sir Henry Clinton, who was put in command of the British forces in the colonies, abandoned Philadelphia and moved his army through New Jersey to reinforce New York City. Meanwhile the French Vice Admiral Comte d’Estaing was on his way to America with a French fleet of twelve ships. Had he arrived sooner, he could have caught General Howe, who was transporting Clinton’s artillery and supplies on the Delaware River. But d’Estaing arrived too late, and Howe completed his transit of the Delaware on 28 June 1778. Howe delivered Clinton’s supplies the next day, and then he stationed frigates in New York Harbor to warn of the approach of the French naval forces.</p>	
The Closing Campaigns	<p>Explain that when d’Estaing arrived off New York on 11 July, General Washington offered to launch a land attack while d’Estaing attacked by sea. However, the French ships could not get into the shallow harbor, so d’Estaing sailed away to the Caribbean, where he remained for over a year.</p> <p>Explain that d’Estaing returned to the colonies in September 1779, to help the Americans try to recapture New York. On 9 October French ships and troops, together with American troops, launched an attack, but the British held them off. D’Estaing returned to France with his fleet.</p>	
The Closing Campaigns	<p>Explain that in Morristown, Washington’s troops were suffering through their most difficult winter. Confident that these troops were not a threat to New York City, Clinton mounted a major offensive in the south in February 1780. His large fleet set sail for Charleston, South Carolina, and there surrounded the American forces.</p> <p>Explain that the city had held off the British for three years, but Clinton’s new force was overwhelming, and the city’s defenses soon broke down. On 12 May, the entire garrison of 5,000 men surrendered to the British. The last Continental naval squadron was captured in Charleston Harbor at about this time, so the Continental Navy was never again an effective fighting force.</p>	30
The Closing Campaigns	<p>Explain that in August 1780, Clinton received word that a French fleet bringing 5,500 soldiers had arrived in Newport, Rhode Island. He left General Lord Cornwallis, who had come with him, in command in the south and hurried back to New York. Cornwallis defeated General Gates’s forces at Camden, South Carolina, and took the city in mid-August. Cornwallis then moved into North Carolina, and Washington could do nothing to stop him.</p>	31
The Closing Campaigns	<p>Explain that in October General Nathaniel Greene’s troops defeated a Tory force at King’s Mountain, South Carolina, and in January 1781, General Morgan destroyed a British force under General Tarleton at Cowpens. Cornwallis followed Morgan and Greene through North Carolina. He won a battle at Guilford Courthouse, but he lost so many men that he had to retreat. Cornwallis retreated to Wilmington, North Carolina, and asked the Royal Navy to send help to him there. When help did not arrive, he disobeyed Clinton’s orders and led his troops into Virginia, where he would soon be trapped.</p>	32-33
Check on Learning Questions B (Lesson questions 5-6)	<p>Check in on students’ understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.</p>	34

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The Battle of Yorktown	Explain that Cornwallis successfully raided some areas in Virginia, then followed Clinton's orders to entrench his army at Yorktown, on the Chesapeake Bay, late in the summer. The Marquis de Lafayette, an influential young Frenchman who had been appointed as a general in the Continental Army in 1777, immediately sent word of Cornwallis's move to General Washington. Lafayette and General "Mad Anthony" Wayne commanded about 5,000 ragged militia in the area, and these troops kept Cornwallis under observation.	35
The Battle of Yorktown	Explain that in the meantime, French General Comte de Rochambeau, who had brought troops to Newport a year earlier to aid Washington, learned in May 1781 that reinforcements were not coming. In spite of this, he and Washington agreed to battle Clinton's superior troops in New York. Washington wrote to the French minister to ask him to urge Admiral de Grasse, in command of French naval forces in the West Indies, to come north from the Caribbean to join the New York operation.	36
The Battle of Yorktown	Explain that on 14 August 1781, the letter on which everything hinged arrived at Washington's headquarters. De Grasse reported that he would arrive in the Chesapeake with more than twenty-five warships and 3,000 troops in September. Four days later, Washington ordered 4,500 Americans and General Rochambeau's French army of 5,500 to march from New York to Yorktown. He left enough men behind to protect West Point and to keep Clinton occupied in New York. The French fleet sailed south from Newport. Washington hoped to bring all these land and sea forces together to battle the British at Yorktown.	37-38
The Battle of Yorktown	Explain that on 5 September the American and French troops passed through Philadelphia, and General Washington learned that de Grasse was in Chesapeake Bay. On the evening of 14 September Washington and Rochambeau greeted Lafayette and Wayne at Williamsburg, Virginia, and then set up siege lines around Yorktown. The next morning the land forces learned that off the Virginia Capes, de Grasse had driven the British fleet back to New York on 5 September, and that the French fleet from Newport had arrived with artillery and supplies on 10 September. The stage was now set for the attack against Cornwallis.	39-40
The Battle of Yorktown	Explain that twenty thousand French and American troops attacked Yorktown on 9 October. For eight days the combined land forces fired artillery at the British while the French fleets bombarded the city. American forces also stormed two key defensive positions and kept the British from fleeing across the York River to Gloucester. The British fleet that had retreated to New York returned to the Chesapeake with Clinton and 6,000 British troops one week too late to help Cornwallis. He had surrendered his entire army of 7,600 men to General Washington on 19 October 1781.	41
Battle of Yorktown-Aftermath	Explain that the British loss at Yorktown marked the end of the fighting in the colonies. The war then shifted to the West Indies, the Mediterranean, and India. England, tired of war, now faced the powerful combined forces of France, Spain, and the Netherlands in Europe.	42
Battle of Yorktown-Aftermath	Explain that in February 1782, Lord North resigned, and the new pacifist cabinet in Parliament decided not to launch any more offensive attacks in North America. England sent a representative to Paris to discuss peace with the Americans there. The American delegation, headed by Benjamin Franklin, John Jay, and John Adams, insisted on American independence. England still held New York, Charleston, and Savannah in the colonies, but the pressure in Europe was working to the Americans' advantage. Explain that the treaty the Americans and the British drew up gave the colonies their	43-44

Chapter 2 / Section 2: NS2-M1C2S2 – The Crucial Year 1777

	full independence. They would not be under British rule or protection in any way. The colonies received a territory that extended west to the Mississippi, north to the Great Lakes, and south to Florida. The U.S. Congress declared the war over on 11 April 1783, but it was not until 3 September that the American and British representatives signed the Peace of Paris.	
Battle of Yorktown-Aftermath	Explain that the small Continental Navy was generally ineffective throughout the war in the face of what was then the most powerful navy on earth. But it was plain that sea power had played a major role in America gaining its independence. Much of the artillery and other supplies used by the Continental Army came from prizes captured at sea and were delivered by sea routes. Though no one won the battle off the Virginia Capes in 1781, the French fleet prevented the British from helping Cornwallis, leading directly to his surrender. To many Americans, it had become obvious that to keep its freedom America needed a navy of its own.	45
Battle of Yorktown-Aftermath	<div>Chronology</div> <div><div>1775</div><div>Revolution begins</div></div> <div><div>13 Oct. 1775</div><div>Congress establishes Navy</div></div> <div><div>11-13 Oct. 1776</div><div>Battle of Lake Champlain</div></div> <div><div>25 Dec. 1776</div><div>Washington crosses Delaware</div></div> <div><div>17 Oct. 1777</div><div>Burgoyne surrenders at Saratoga</div></div> <div><div>6 Feb. 1778</div><div>France allies with America</div></div> <div><div>23 Sept. 1779</div><div>Jones defeats Serapis</div></div> <div><div>12 May 1780</div><div>Charleston surrenders</div></div> <div><div>9-19 Oct. 1781</div><div>Battle of Yorktown</div></div>	46-47
Review Question	The Review Question is, “What was the most important thing you learned in this lesson that you didn’t already know? Why was it important to you?” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	48
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	49
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	50

Chapter 2 / Section 2: NS2-M1C2S2 – The Crucial Year 1777

III. Supplemental Activities -

A. In Class Activity:

Supplies Required: Take home handout

When: At the end of the lesson

- In Class: Engaged cadets in a discussion about what constitutes an MVP (most valuable player). What criteria should be used? What qualities make up an MVP?

B. Take Home Activity: Cadets complete the “American Revolution MVP” activity.



Tech Tip: Ask Cadets to share their MVP nominee with the whole class and create a list of nominees. Once all have presented, have a full class vote using student response systems as to who they would pick as the overall winner.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 2 / Section 2: NS2-M1C2S2 – The Crucial Year 1777

Activity 1: At Home – American Revolution MVP Activity

Name: _____ Date: _____ Class: _____

You have been asked to deliver the Most Valuable Person award at the American Revolution victory dinner. When you present the award, you are also asked to say a few words as to why the person you selected was chosen. Many important people will be there, so be sure to give specific reasons and examples for your selection!

I chose _____ as the American Revolution MVP because:

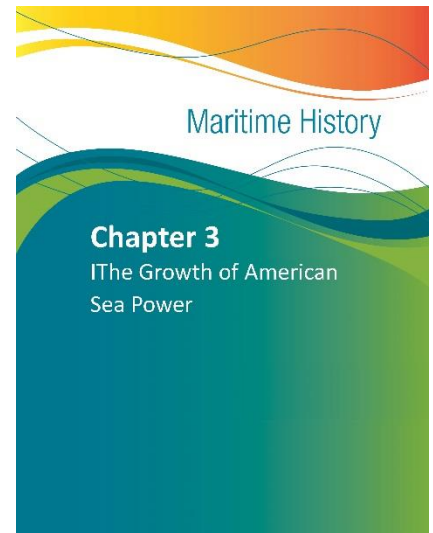
Module 1 Chapter 3: NS2M1C3 – The Growth of American Sea Power

What Students Will Learn to Do:

Demonstrate an understanding of the Growth of American Sea Power from 1783 – 1860

Skills and Knowledge to be Gained:

1. Explain the reasons why the American economy suffered in 1783
2. Explain the changes the U.S. Constitution caused in the American industry
3. Cite the events surrounding the Navy Act of 1794
4. Explain the events during the quasi-war between America and France
5. Explain why America began a war with Tripoli and the Barbary Pirates, 1801 – 1805
6. Cite the events surrounding the capture and destruction of the USS Philadelphia
7. Cite the lessons America learned from the war with the Barbary States
8. Explain the events that led America toward war with England
9. Explain the events that surrounded the Chesapeake incident
10. Describe the events that led to the final moves toward war between the United States and Britain
11. Describe the major sea battles between the American and the British forces during the War of 1812
12. Cite other high sea battles that occurred during the War of 1812
13. Explain the significant sea victories that occurred during the war of 1812
14. Explain other major incidents where the British prevailed over America's sea vessels
15. Explain the U.S. victories of Lake Erie and its effect on the North west Territory
16. Cite the offensive maneuvers used by the British Navy during the War of 1812
17. Describe the major events of the battle of New Orleans at the conclusion of the war.
18. Explain how sea power influenced the spread of Western Civilization and the formative years of the new American republic
19. Explain the contribution the U.S. Navy made to the progress of world trade between 1815 and 1860
20. Describe the rapid growth and subsequent decline of the American whaling industry
21. Explain America's role in the slave trade
22. Explain the events that led to the beginning of the Mexican War and the significance of the Treaty of Guadalupe Hidalgo
23. Describe the effects the clipper ships had on trade with China
24. Explain the purpose of Commodore Perry's mission to Japan



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...

Module 1 Chapter 3: NS2M1C3 – The Growth of American Sea Power

- RI.9-10.7. Analyze various accounts of a subject told in different mediums...

Writing

- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.9-10.5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach...
- W.9-10.8. Gather relevant information from multiple authoritative print and digital sources...

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks...

Language

- L.9-10.3. Apply knowledge of language to understand how language functions in different contexts...
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Civic and Political Institutions

- D2.Civ.3.9-12. Analyze the impact of constitutions, laws, treaties, and international agreements on the maintenance of national and international order.
- D2.Civ.5.9-12. Evaluate citizens' and institutions' effectiveness in addressing social and political problems at the local, state, tribal, national, and/or international level.
- D2.Civ.6.9-12. Critique relationships among governments, civil societies, and economic markets.

Dimension 2. Economic Decision Making

- D2.Eco.4.9-12. Evaluate the extent to which competition among sellers and among buyers exists in specific markets.
- D2.Eco.5.9-12. Describe the consequences of competition in specific markets.

Dimension 2. Geography

- D2.Geo.2.9-12. Use maps, satellite images, photographs, and other representations...
- D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems...
- D2.Geo.5.9-12. Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.

Dimension 2. History

Module 1 Chapter 3: NS2M1C3 – The Growth of American Sea Power

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...
- D2.His.4.9-12. Analyze complex and interacting factors that influenced the perspectives of people during different historical eras.

Dimension 4. Communicating Conclusions and Taking Informed Action

- D4.1.9-12. Construct arguments using precise and knowledgeable claims, with evidence from multiple sources...
- D4.2.9-12. Construct explanations using sound reasoning, correct sequence, examples, and details with significant and pertinent information and data...
- D4.6.9-12. Use disciplinary and interdisciplinary lenses to understand the characteristics and causes of local, regional, and global problems...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 3 / Section 1: NS2-M1C3S1 – A New American Government

(Section 1 of 4)

What Students Will Learn to Do:

Demonstrate an understanding of the Growth of American Sea Power from 1783 – 1860

Skills and Knowledge to be Gained:

1. Explain the reasons why the American economy suffered in 1783
2. Explain the changes the U.S. Constitution caused in the American industry
3. Cite the events surrounding the Navy Act of 1794
4. Explain the events during the quasi-war between America and France
5. Explain why America began a war with Tripoli and the Barbary Pirates, 1801 – 1805
6. Cite the events surrounding the capture and destruction of the USS Philadelphia
7. Cite the lessons America learned from the war with the Barbary States

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	A New American Government	The Navy Act Of 1794	Check On Learning A
Quasi-War with France, 1798-1800 (A)	Videos Quasi-War with France, 1798-1800	Quasi-War with France, 1798-1800 (B)	War with Tripoli and the Barbary Pirates, 1801-1805	The Philadelphia Incident (A)	Video The Philadelphia Incident	The Philadelphia Incident (B)	Check on Learning B	
Attack on Tripoli (A)	Video1 Attack on Tripoli	Attack on Tripoli (B)	Video2 Attack on Tripoli	Attack on Tripoli (C)	Review Questions	Closing Questions	Call for Other Questions	

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 3 / Section 1: NS2-M1C3S1 – A New American Government

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 3. Place a checkmark beside the NS2-M1C3S1 PowerPoint presentation, and these two CPS question deck files:
NS2- NS2-M1C3S1 - Key Terms and NS2-M1C3S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we are going to learn about the post-Revolution and its effect on the economic condition of the country. This was a time when the Continental Navy and vulnerability of the American merchant ships declined. We will discuss the Navy Act of 1794 and the provisions of this act.</p> <p>We will cover the many events that caused the quasi-war between American and France (1789-1800). You will learn how Tripoli's demand that tribute be paid for access through their waters caused the war with Tripoli and the Barbary Pirates. America fought back by blockading the port of Tripoli.</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "List 2-3 reasons why some might have felt there was no need for a US Navy in the late 1700's." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on a new American government.	7
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	8

Chapter 3 / Section 1: NS2-M1C3S1 – A New American Government

Introduction	Explain that when the Treaty of Paris ended the Revolutionary War in 1783, the new nation was badly in debt. The government did not have authority to raise money through taxation, so there were no funds for maintaining ships or building new ones. In 1783, when the <i>Alliance</i> was sold, the old Continental Navy passed into history. The officers and men who had served in the Continental Navy returned to their peacetime jobs of merchant shipping and shipbuilding.	9
Introduction	Explain that American merchant mariners and shipbuilders soon found, however, that the British were not going to make life easy for them. The British government issued Orders in Council that sought to keep Americans out of the East Indies trade, limited exports to England, and made it illegal for British subjects to buy ships built in America.	10
Introduction	Explain that American merchants had to find new overseas markets for their trade. Some looked to China, but China was far away, and a voyage to China was expensive in both time and money. Now that the protection of the British flag was removed, American ships trading in the Mediterranean and eastern Atlantic region became subject to harassment by pirates from the Barbary states of Morocco, Algiers, Tunis, and Tripoli. They had been capturing ships and crews for ransom in these waters for hundreds of years. European nations such as Britain, France, and the Netherlands had long paid tribute money to these states so they could sail their waters in safety. The United States had no such arrangements. In 1784 and 1785, three American ships were seized by the Barbary pirates. The United States concluded a treaty of peace and friendship with Morocco in 1786, but no agreements were reached with the other Barbary states for another ten years.	11-12
A New American Government	Explain that in 1789 the Articles of Confederation were replaced by the U.S. Constitution. The Constitution authorized Congress “to provide and maintain a navy,” but other needs in the new nation were more pressing. Besides, a war had started between Portugal and Algiers, and this made it possible for American merchantmen in the Mediterranean to join with Portuguese and Spanish convoys for protection. The need for a navy seemed less urgent.	13-14
A New American Government	Explain that one of the first acts of the new U.S. government helped American merchants. The government decided to impose tariffs (taxes) on incoming foreign shipping, which gave an immediate advantage to U.S. shipping. Additionally, British West Indian planters needed and began welcoming U.S. ships and the goods they carried, despite the Orders in Council that prohibited such trade.	15
A New American Government	Explain that with these incentives, U.S. shipping and shipbuilding grew rapidly until 1793. In that year Portugal and Algiers declared a truce, and soon thereafter, a pirate fleet captured ten U.S. ships in the Mediterranean. In addition, in 1790 the Napoleonic Wars had broken out in Europe, and France had declared war on Britain. British warships then began to seize neutral vessels trading with France, and French privateers began capturing neutral vessels trading with British possessions such as the West Indies. The time had come for the United States to give serious consideration to building a navy.	16
The Navy Act of 1794	Explain that not all Americans were in favor of building a navy. Those who lived inland did not want to be taxed for something they felt would benefit mainly those who lived along the coast. So the Navy Act that Congress eventually passed in 1794 provided for only six frigates, and their construction would stop if the United States made peace with Algiers. In 1796 this happened, but President Washington convinced Congress to allow the work on three frigates to be completed. The <i>United States</i> and the <i>Constitution</i> , both forty-four guns, and the <i>Constellation</i> , thirty-eight guns, were launched in 1797.	17-18

Chapter 3 / Section 1: NS2-M1C3S1 – A New American Government

The Navy Act of 1794	Explain that the British realized early in their war with Napoleon's France that they would need trade goods carried in U.S. ships, and so they stopped seizing the ships. The British and the Americans worked out their other maritime differences in Jay's Treaty. Both countries signed the Jay's Treaty in 1797.	19
The Navy Act of 1794	Explain that the French were outraged by this agreement, and they increased their raids on U.S. ships. In one year French privateers in the West Indies and along the U.S. Atlantic coast seized over 300 U.S. merchant ships. In the fall of 1797 President John Adams sent three representatives to Paris to try to work out a settlement. The French wanted these men to pay a huge bribe to begin the talks, but they refused. Americans everywhere responded to the French demand with the slogan "Millions for defense, but not one cent for tribute!"	20
The Navy Act of 1794	Explain that the French XYZ affair, as this came to be called, motivated Congress to finish building the six frigates authorized in 1794. The <i>President</i> , forty-four guns, and two thirty-six-gun ships, the <i>Congress</i> and the <i>Chesapeake</i> , were soon launched, along with some smaller vessels. On 30 April 1798, Congress established the Navy Department. The following month, it allowed U.S. vessels to seize armed French ships found to be cruising in U.S. coastal waters. The United States had started an undeclared naval war, the Quasi-War with France.	21
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	22
Quasi-War with France, 1798-1800	<p>Explain that John Adams had men and ships but lacked a leader. He chose a merchant shipper from Maryland, Benjamin Stoddert, to be his first Secretary of the Navy. Stoddert immediately ordered his warships to patrol the Atlantic coast. The first American prize was the <i>Croyable</i>. This privateer was captured in July 1798 and renamed the <i>Retaliation</i>. The <i>Retaliation</i> was put in service in the U.S. Navy.</p> <p>Explain that that same month, Congress extended its authorization and allowed U.S. ships to capture armed French ships on the high seas. Stoddert was then able to send a series of expeditions to the West Indies, where most of the French privateers were based. The first mission, led by Commodore John Barry, captured only two privateers because most of the French ships were able to escape into shallow water where the U.S. vessels could not follow. In the second expedition, which arrived in the fall of 1798, Lieutenant William Bainbridge was defeated in the <i>Retaliation</i>. The ship was returned to French hands.</p>	23
Quasi-War with France, 1798-1800	Explain that after the U.S. Navy cleared U.S. coastal waters, Stoddert sent twenty-one ships in four squadrons to the West Indies. There, U.S. vessels had the support of the Royal Navy and were allowed to use British bases. U.S. officers and seamen learned many useful things as they served with what was then, the finest navy in the world.	24
Videos on Quasi-War with France, 1798-1800	Show two videos on Quasi-War with France, 1798-1800	25-26
Quasi-War with France, 1798-1800	Explain that finally, in October 1800, after more than two years of undeclared war, a peace treaty was signed between France and the United States. One of the provisions in the treaty was a very unpopular clause canceling U.S. claims against the French for attacking U.S. merchant ships. Thomas Jefferson was able to defeat John Adams in the presidential election of 1800, in part, because of the uproar caused by the treaty.	27

Chapter 3 / Section 1: NS2-M1C3S1 – A New American Government

Quasi-War with France, 1798-1800	<p>Explain that by war's end, the U.S. fleet and Navy included:</p> <ul style="list-style-type: none"> • Fifty vessels • 6,000 seamen • Over 500 commissioned officers and midshipmen • Included 1,100 in the U.S. Marine Corps 	28
Quasi-War with France, 1798-1800	<p>Explain that during the war, the U.S. fleet had grown rapidly. U.S. exports had risen to more than \$200 million, and the income from imports was more than \$22 million. The Navy had spent only \$6 million to protect this commerce from the French. It was clear that the Navy benefited New England shipping, but it also benefited the economy of the entire nation.</p>	29
War with Tripoli and the Barbary Pirates, 1801-1805	<p>Explain that as part of his campaign for the presidential election of 1800, Jefferson had promised to reduce government spending. The Navy cost the country over \$2 million every year, so after his election, making the Navy smaller was one way for Jefferson to keep his promise. He began to sell smaller naval ships.</p> <p>Explain that the Barbary pirates then began to cause more trouble. When the frigate <i>George Washington</i> arrived in Algiers with a tribute payment in September 1800, the dey of Algiers (the Algerian leader) ordered Captain William Bainbridge to take passengers and the tribute payment to the sultan in Constantinople. When Bainbridge refused, the dey aimed the guns of the fortress at the frigate and forced Bainbridge to carry out his orders. After this incident, other Barbary states increased their tribute demands. Jefferson refused to pay them. In May 1801, when the United States did not meet the tribute demands of the Pasha of Tripoli, the Pasha declared war on the U.S.</p>	30
War with Tripoli and the Barbary Pirates, 1801-1805	<p>Explain: that summer, the twelve-gun schooner <i>USS Enterprise</i> blockaded the port of Tripoli for eighteen days and then left for Malta. On the way she met and defeated a Tripolitan cruiser, the <i>Tripoli</i>. Other U.S. warships convoyed U.S. merchantmen through the Mediterranean. By the end of summer, most of the crews' enlistments were running out and the squadron had to return home.</p> <p>Explain that a more powerful squadron was prepared for the next year. This squadron arrived in the spring of 1802, under the command of Richard Morris. The Americans were able only to capture one Tripolitan cruiser and destroy another. Morris's blockade of Tripoli was not effective, and Tripoli refused to lower its price for peace.</p>	31
War with Tripoli and the Barbary Pirates, 1801-1805	<p>Explain that embarrassed by these failures, President Jefferson ordered Morris replaced by Commodore Edward Preble.</p> <p>Explain that when Preble arrived in Gibraltar in September 1803, he found that Morocco had broken its treaty with the United States by capturing a U.S. vessel. He quickly sent the <i>Philadelphia</i> under Captain Bainbridge and a schooner to blockade Tripoli. Then he assembled a powerful force in the Moroccan port of Tangier. The emperor of Morocco was intimidated by Preble's display of strength, and after that he honored his treaty with the United States.</p>	32-33
The Philadelphia Incident	<p>Explain that while she was blockading Tripoli, the <i>Philadelphia</i> had run aground and been captured. Her crew of more than 300 was then held for ransom. Unfortunately, the Tripolitans were able to free the U.S. vessel from the reef she on which she was stranded, and they anchored her near the guns of the castle.</p> <p>Explain that Commodore Preble's squadron arrived off Tripoli in December. Preble saw that the <i>Philadelphia</i> was too closely guarded to be recaptured, but he wanted to destroy her so that Tripoli could not use her.</p>	34

Chapter 3 / Section 1: NS2-M1C3S1 – A New American Government

The Philadelphia Incident	Explain that Lieutenant Stephen Decatur, Jr. volunteered to lead a raiding party into the harbor to burn the Philadelphia. On 16 February 1804 Decatur and his men slipped into the harbor in a captured Tripolitan ketch renamed the <i>Intrepid</i> . Decatur disguised himself in Maltese dress and stood next to his vessel's Sicilian pilot. Some of his seventy volunteers, also in disguise, stayed on deck, but most hid below.	35
Video on the Philadelphia Incident	Show video on the Philadelphia Incident.	36
The Philadelphia Incident	Explain that the Americans then re-boarded the <i>Intrepid</i> and returned safely to the squadron, despite being fired upon by the Tripolitan fort and several warships. Explain that when news of the exploit reached the United States, Decatur was hailed as a hero and given a captain's commission. At twenty-five he was the youngest man to reach the rank of captain in the short history of the U.S. Navy.	37
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	38
Attack on Tripoli	Explain that during the summer of 1804, Preble tried to convince the pasha of Tripoli to release the crewmen of the <i>Philadelphia</i> , but he refused. Preble decided he would have to use force. He obtained half a dozen gunboats plus some other craft from the king of Naples and attacked Tripoli on 3 August. Nine Tripolitan gunboats came out to attack them. The Tripolitans were ready to board and fight hand to hand, but the Americans surprised them by leaping onto the lead Tripolitan vessels and fighting wildly.	39
Video on the Attack on Tripoli #1	Show video on the attack on Tripoli #1	40
Attack on Tripoli	Explain that Decatur and his men captured the first enemy gunboat while the squadron kept the others away. During the battle, Decatur broke off the blade of his cutlass and would have been killed if a seaman named Reuben James had not thrust his own head under a sword meant for Decatur.	41
Attack on Tripoli	Explain that as Decatur was towing his prize out of the harbor, he learned that his younger brother James had been shot as he stepped on board to take control of another enemy gunboat that had surrendered. The gunboat was trying to escape when Stephen Decatur overtook her, boarded her, and killed her captain in a hand-to-hand fight. Explain that by the time Preble called an end to the battle, the Americans had captured three enemy gunboats. Following this attack, the Pasha of Tripoli offered to return the U.S. crewmen for \$150,000 in ransom money and to demand no more tribute.	42
Attack on Tripoli	Explain that Preble rejected the offer and ordered his forces to bombard Tripoli. The Americans continued the bombardment during the next few weeks, but the enemy gunboats never again came out to fight the U.S. vessels. Explain that President Jefferson and the U.S. public were spurred to action by Preble's feats. They hoped that a final victory would end the war with Tripoli and make all of the Barbary states stop demanding tribute. Jefferson sent a powerful U.S. naval force to the Mediterranean, and he ordered Captain Samuel Barron to replace Preble. The United States gave Preble a hero's welcome when he returned to Washington.	43

Chapter 3 / Section 1: NS2-M1C3S1 – A New American Government

Attack on Tripoli	<p>Explain that the U.S. naval forces kept Tripoli blockaded through the early part of 1805. Plans were made for a better blockade and more attacks on the city in the summer, when more gunboats were to arrive from America.</p> <p>Explain that in the meantime, William Eaton, a bold U.S. naval agent to the Barbary states, devised a scheme to topple the pasha from his throne. He convinced the pasha's dethroned older brother, Hamet, then in exile with the Mamelukes in Egypt, to join a ragtag army of about 400 Muslim and European mercenaries he had put together to attack Tripoli and restore the throne to Hamet.</p>	44
Video on the Attack on Tripoli #2	Show video on the attack on Tripoli #2	45
Attack on Tripoli	<p>Explain that Eaton's army, which included a small contingent of U.S. Marines led by Lieutenant Presley O'Bannon, marched some 600 miles westward from Egypt through the North African desert in March and April 1805. On 27 April, this force, under the leadership of Eaton and O'Bannon with the help of two brigs and a schooner from the naval squadron, attacked and captured the port city of Derna across the Gulf of Sidra from Tripoli.</p>	46
Attack on Tripoli	<p>Explain that after the capture O'Bannon raised the Stars and Stripes over the city's harbor fortress, marking the first time the American flag was raised over captured foreign soil. Later, tradition has it that Hamet presented his Mameluke sword to O'Bannon in recognition of his bravery in capturing the city and defending against counterattacks over the next several weeks. This action was later memorialized by the phrase "to the shores of Tripoli" in the Marine Corps hymn, and each new U.S. Marine officer wears a commemorative Mameluke sword upon commissioning.</p>	47
Attack on Tripoli	<p>Explain that unfortunately, Eaton's triumph was short-lived. Word came in June that the United States had signed a treaty ending the war with the pasha at Tripoli. In return for \$60,000 in ransom and a promise that the United States would no longer support his brother, the pasha agreed to release the captive <i>Philadelphia</i> crewmembers and end all further demands for tribute payments. Eaton was ordered to take Hamet and evacuate Derna, which he reluctantly did, abandoning most of his army. The vengeful pasha subsequently executed most of those that were left behind, a chain of events that left a legacy of Arab-American distrust that lingers still today</p>	48
Attack on Tripoli	<p>Explain that some Americans were pleased by the treaty with Tripoli. They believed the ransom was reasonable and should be paid to free the captives, who had suffered for a year and a half. They also welcomed the end of tribute paying. The Americans who did not like the treaty thought more attacks on Tripoli would have forced Tripoli and the other Barbary states to accept treaties that were more favorable to the United States. As it turned out, the Americans who opposed the treaty were correct.</p>	49
Attack on Tripoli	<p>Explain that the lesson offered by the war with Tripoli has two parts. First, giving in to demands for tribute and ransom (appeasement) usually leads only to more demands. Second, a weak navy invites aggressive actions by enemies. Refusing to give in to demands and maintaining a strong navy help to keep a nation out of war.</p>	50

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Review Question	The Review Question is “Discuss what occurred in the United States in 1789 that enabled Congress to authorize creation of the Navy.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	51
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	52
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	53

III. Supplemental Activities -

A. In class Activity: Barbary Pirate

Supplies required: Take home handout

When: This is a good activity to do the beginning of class.

- With the class: Have everyone stand. Now ask your students which of them would be willing to give you 10 pushups every time they entered your classroom? They get to sit down after they do their pushups. Now, ask who would like to run a mile every week after school for you? This group can come into the classroom as often as they like at no additional charge and they also may sit down. The rest of you have to stand for the remainder of the lecture. There is a way for this group to sit as other members of the class who are sitting may do 20 pushups. For each 20 pushups, one additional student may sit. Note, these students will still be required to either do the 10 pushups every time they come to class, or do the weekly run.
- Class question: What is this? Do you like having to pay these fees? So what if another country was requiring the United States to pay large sums of money every time one of its citizens entered that country to sell goods? What would you do? How would you accomplish this? What if they imprisoned the citizens that did not make the required payments?

B. Take Home Activity: In the warm-up question today, we asked the cadets to list 2-3 reasons why some might have felt there was no need for a US Navy in the late 1700's? Have the cadets determine if the US Navy today is being reduced or increased in size. Are there similar reasons for this change from the late 1700's to the mid 1800's? Have the cadets write a one page essay on their determination of the changing size of the current US Navy. They should include what they believe is the driving force in today's change and how it is similar, or not, to the reasons for the changes in the late 1700's to mid 1800's with the US Navy of that time.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 3 / Section 1: NS2-M1C3S1 – A New American Government

Activity 1: Take Home Activity- Change in the Navy

Name: _____ Date: _____ Class: _____

Directions: Determine if the US Navy today is being reduced or increased in size. Are there similar reasons for this change from the late 1700's to the mid 1800's? Write a one page essay on your determination of the changing size of the current US Navy. Include what you believe is the driving force in today's change and how it is similar, or not, to the reasons for the changes in the late 1700's to mid 1800's with the US Navy of that time.

[illegible]

Chapter 3 / Section 2: NS2-M1C3S2 – Toward War with England

(Section 2 of 4)

What Students Will Learn to Do:

Demonstrate an understanding of the Growth of American Sea Power from 1783 – 1860

Skills and Knowledge to be Gained:

1. Explain the events that led America toward war with England
2. Explain the events that surrounded the Chesapeake incident
3. Describe the events that led to the final moves toward war between the United States and Britain
4. Describe the major sea battles between the American and the British forces during the War of 1812
5. Cite other high sea battles that occurred during the War of 1812
6. Explain the significant sea victories that occurred during the war of 1812
7. Explain other major incidents where the British prevailed over America's sea vessels
8. Explain the U.S. victories of Lake Erie and its effect on the North west Territory
9. Cite the offensive maneuvers used by the British Navy during the War of 1812
10. Describe the major events of the battle of New Orleans at the conclusion of the war

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	KeyTerm Definitions	Opening Question	Warm Up Questions	America Moves toward War with England	The Chesapeake Affair	Final Moves toward War	Check On Learning A
The War of 1812 (A)	Video1 The War of 1812	The War of 1812 (B)	Video2 The War of 1812	The War at Sea	Other High Seas Battles (A)	Video1 Other High Seas Battles	Other High Seas Battles (B)	Video2 Other High Seas Battles
British Sea Power Prevails	The Great Lakes Campaigns (A)	Video The Great Lakes Campaigns	The Great Lakes Campaigns (B)	Check on Learning B	The Final Year of War (A)	Video1 The Final Year Of War	The Final Year of War (B)	Video2 The Final Year Of War
The Final Year of War (C)	Conclusion of War – Battle of New Orleans	Video Battle of New Orleans	Review Questions	Closing Questions	Call for Other Questions			

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 3 / Section 2: NS2-M1C3S2 – Toward War with England

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 3. Place a checkmark beside the NS2-M1C3S2 PowerPoint presentation, and these two CPS question deck files:
NS2-M1C3S2 - Key Terms and NS2-M1C3S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will discuss the military accomplishments of Captain Edward Preble and his command during the war with the Barbary States in the Mediterranean Sea. The lesson learned from the war with the Barbary States will not soon be forgotten. We will learn about the war of 1812. Despite the weak naval policies during this time, the United States Navy had two advantages that made American naval operations in the War of 1812 among the greatest in the nation's history. First, it had a corps of skilled officers. Second, the <i>USS Constitution</i>-class frigates were the finest ships of their type in the world, and were the result of America's own genius. You will learn how the victories on Lake Erie and Lake Champlain proved to be a turning point for the U.S. Navy. The British were anxious to conclude the war with America. In August of 1814, President Madison accepted a British proposal to negotiate in Ghent, Belgium to end the war. The American Navy won new respect throughout the world for itself and for the nation.</p>	1-5
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	6
Key terms - Definitions	Reinforce the correct definition for each key term.	7
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "List 2-3 lyrics of the Star Spangled Banner that you think are most descriptive of a battle." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on a moving toward war with England.	8

Chapter 3 / Section 2: NS2-M1C3S2 – Toward War with England

Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	9
America Moves toward War with England	<p>Explain that, as mentioned previously, throughout the 1790s, Napoleon Bonaparte’s France had been at war with most of Europe. In 1797, Bonaparte attempted to conquer Egypt, but he was defeated by Britain’s Admiral Lord Nelson at the Battle of Abu Qir Bay in August, 1798. Still, he was able to seize control of the French government in 1799, and the following year he forced Spain to cede the Louisiana Territory in America to France. In 1802, the British and French agreed to peace in the Treaty of Amiens, but Napoleon knew that further conflict with the British was inevitable. Besides, the Louisiana Territory was far away and difficult to administer. So, in 1803, as a way to finance his anticipated war against England, Napoleon sold the Louisiana Territory to the United States for \$15 million. Napoleon also hoped that this would cause the United States to look with favor toward France in its coming struggle with Britain, which began again later in 1803.</p>	10-12
America Moves toward War with England	<p>Explain that for two years following the outbreak of war between France and Britain in 1803, the U.S. merchant marine made great profits as the leading remaining neutral carrier of ocean commerce. But in 1805, that changed. At the Battle of Trafalgar that year, the British fleet under Admiral Nelson smashed the combined fleets of France and Spain, France’s ally, making Britain ruler of the seas. At the Battle of Austerlitz, December 1805, in Austria, Napoleon crushed the combined Austrian and Russian armies, making France master of the European continent. England and France then struck against each other’s sea lines of communication. This was an action that would inevitably involve the United States.</p>	13-14
America Moves toward War with England	<p>Explain that once again, as had happened in the mid-1790s, U.S. merchant ships were subjected to harassment and capture as prizes on the high seas. British Orders in Council closed French ports to foreign shipping, and French decrees ordered French privateers to seize any ships trading with England or carrying British goods to continental European ports. Nevertheless, U.S. merchants continued to make great profits by trading desperately needed supplies with both sides.</p>	15
The Chesapeake Affair	<p>Explain that gradually, however, because of increasing incidents of impressment as the war dragged on and American sentiment turned against the British. According to British naval custom, if short of crew, British warship captains could stop any British merchantmen and take the men needed to fill their crews. But problems arose when the British began seizing seamen off U.S. ships, claiming they were deserters from the Royal Navy. This may have had some basis in fact, for conditions in the Royal Navy were often bad and U.S. merchant seamen made good wages. It was not uncommon during these years for British warships to lose a significant part of their crews to desertion whenever they visited an American port.</p> <p>Explain that bad as the growing number of impressments on merchant ships was, irate feelings against the British became even more inflamed when a U.S. warship was boarded and some of her crew was forcibly removed. In 1807, the U.S. frigate <i>Chesapeake</i>, thirty-six guns, was set upon by the <i>HMS Leopard</i>, fifty guns, off Cape Henry, Virginia. The <i>Chesapeake</i> was fired upon and forced to surrender, after which the British took four of her seamen. One was soon hanged as a British deserter.</p>	16

Chapter 3 / Section 2: NS2-M1C3S2 – Toward War with England

The Chesapeake Affair	Explain that the nation was outraged, and there were many demands for a declaration of war against England. President Jefferson, however, was greatly opposed to any American involvement in the European wars. He tried to stop the movement toward war by having Congress pass an embargo (stoppage) of exports of needed raw materials and food to Europe. He hoped that this would force the European powers to respect U.S. rights. Explain that all that the embargo did was cause severe economic strain for U.S. shipping companies in New England and for farmers in the South and West. Soon smuggling became rampant, further draining revenue from the government. Further, neither Britain nor France stopped impressing American seamen or seizing U.S. merchant ships.	17
The Chesapeake Affair	Explain that by 1812, the English had taken over 900 U.S. ships and had impressed more than 6,000 U.S. citizens into duty with the Royal Navy. France had seized over 500 U.S. merchant ships.	18
Final Moves toward War	Explain that James Madison became president in 1809. The next year, congressional elections brought into office young “War Hawks” from the South and West. These men called for an end to pacifism and urged an invasion of Canada as punishment for the outrages at sea. They also wanted to expand U.S. territory. Madison did not want war, and urged Congress to make one last try to halt the harassment at sea. Congress passed a bill stating that the United States would cease importing from any nation that did not do away with restrictions on U.S. trade. Explain that in response, Napoleon quickly repealed all French decrees against U.S. shipping, hoping this would bring the United States into the war against Britain if the British did not follow suit.	19
Final Moves toward War	Explain that Britain did not repeal the Orders in Council, so Madison enforced the law against importing British goods. This angered the British and made them think that the United States was uniting with France against them. Britain kept up the impressment of sailors on the high seas and harassment of U.S. ships, and “Freedom of the seas!” became the <i>War Hawks’</i> slogan. Britain and the United States were moving toward war.	20
Final Moves toward War	Explain that matters reached a critical point in April 1811 when the British frigate <i>Guerrière</i> , thirty-eight guns, stopped a U.S. merchantman off New York and impressed one of the ship’s seamen, a native of Maine. Commodore John Rodgers was sent to sea in the forty-four-gun <i>President</i> to protect U.S. shipping. On the evening of 16 May, off the Virginia capes, the <i>President</i> came upon a ship that refused to identify herself. It is unclear who fired first, but the <i>President</i> soon silenced the stranger by pouring broadsides into her. The ship drifted away in the night, but the next morning Rodgers saw her a short distance away in great distress. The ship turned out to be the British sloop of war <i>HMS Little Belt</i> , twenty guns. She managed to limp into Halifax, Nova Scotia, with thirty-two dead and wounded crewmen. Rodgers was hailed as a hero for getting revenge for the <i>Chesapeake</i> .	21
Final Moves toward War	Explain that also in 1811, the British incited Tecumseh, a Shawnee Indian chief, to unite the tribes in the old Northwest Territory against white settlers. The usual horrors of Indian warfare took place in the Indiana and Ohio Territories. In November 1811, General William Henry Harrison led a well-trained U.S. frontier army against the Indians at Tippecanoe Creek in Indiana. He won an important victory, and Tecumseh fled to Canada to join British forces.	22-23

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Final Moves toward War	Explain that New England senators and congressmen did not want to go to war, for in spite of the harassment at sea, their voters back home would get rich if only one ship in three made it to port. But the War Hawks, under the strong leadership of Henry Clay, Speaker of the House, and Senator John C. Calhoun, finally persuaded Madison to ask Congress for a declaration of war. On 18 June, 1812, the United States declared war on Britain for impressment, interference with neutral trade, and British plots with the Indians in the Northwest.	24
Check on Learning Questions A(Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	25
The War of 1812	Explain that the U.S. Navy in 1812 had only sixteen ships, seven of them frigates. Many were in need of repairs, and all were short of crew. Wood for shipbuilding and stores had been exhausted. Several hundred gunboats built by Jefferson lay rotting in rivers and harbors, along the East Coast. The same congressmen who voted the nation into war only seven months before, had voted down a plan to build a dozen large ships-of-the-line and twenty frigates.	26
The War of 1812	Explain that Britain, on the other hand, had more than 600 men-of-war, including some 250 ships-of-the-line and frigates. Fortunately for the United States, most of this fleet was in Europe blockading the ports of Napoleon's France. Faced with these odds, the U.S. naval strategy was clear: try to protect the nation's sea trade while harassing the British Navy and sea commerce with small squadrons and individual commerce raiders.	27
Video 1 on The War of 1812	Show video 1 on the War of 1812	28
The War of 1812	Explain that in the early days of the war, U.S. land forces launched an invasion into Canada. Because it was poorly planned and met with stiff British and Canadian opposition, the invasion was unsuccessful. The Canadians captured a U.S. fort at Mackinac Island in Lake Huron, giving the British control of the upper Great Lakes region. The British then chased the Americans out of Detroit, built a fleet on Lake Erie, and helped Tecumseh and his Indian allies continue fighting in the Northwest Territory.	29
Video 2 on The War of 1812	Show video 2 on the War of 1812	30
The War at Sea	Explain that things at sea went considerably better for the United States at first. Several significant victories were won by American warships in one-on-one encounters with British men-of-war. The first of these occurred on 19 August 1812, when the USS <i>Constitution</i> , commanded by Captain Isaac Hull, one of Preble's Boys, encountered HMS <i>Guerrière</i> off the coast of Nova Scotia. Of all British ships, Americans hated <i>Guerrière</i> most, because of her role in impressing American seamen a year earlier.	31
The War at Sea	Explain that Captain Dacres of the <i>Guerrière</i> opened fire first, but Hull calmly told his gunnery officers to wait. By 1800 hours, Hull had brought the <i>Constitution</i> to within 100 yards of his opponent. With both ships running before the wind, he ordered his first broadside fired. Exchanges of broadside after broadside followed. Dacres saw his shot rip through the rigging or bounce harmlessly off the heavy oaken hull of the American ship, earning for her the nickname " <i>Old Ironsides</i> ." The U.S. captain first aimed his fire at the enemy ship's waterline, tearing gaping holes that allowed water to pour inside. Next he aimed at the masts. Within twenty minutes the <i>Guerrière's</i> mizzenmast had been knocked off. It was soon followed by the foremast and	32

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	mainmast. The battle was over, and Dacres surrendered. The <i>Guerrière</i> sank the next day.	
The War at Sea	Explain that although at the time Americans called this one of the greatest battles of the war, in reality it was not of great importance. Though surprised and dismayed, the British could easily afford to lose one frigate in battle. But for Americans, this was a great boost to morale. On the day Hull returned to Boston, word had been received of bad U.S. defeats in the land battles to the west. Detroit had fallen almost without a fight. The Indians had captured Fort Dearborn (Chicago) and massacred its occupants. The victory of the <i>Constitution</i> was indeed cause for joy.	33
Other High Seas Battles	Explain that in October 1812, another famous battle took place far across the Atlantic. The frigate <i>United States</i> , forty-four guns, under the command of Stephen Decatur, met the British frigate <i>Macedonian</i> , thirty-eight guns. In two hours, Decatur wore the enemy down and captured the ship, a valuable prize.	34
Video 1 on Other High Seas Battles	Show video 1 on other high sea battles	35
Other High Seas Battles	Explain that in December the <i>Constitution</i> , now under the command of Captain William Bainbridge, defeated the British frigate <i>Java</i> , thirty-eight guns, off the coast of Brazil. In February 1813 Captain James Lawrence in the sloop of war <i>Hornet</i> met and sank the brig <i>HMS Peacock</i> off British Guiana.	36
Other High Seas Battles	Explain that the opening months of the war at sea had given the Americans much success. Not only had three British frigates and several smaller men-of-war been beaten, but Lloyd's of London, the major insurer of British merchant ships of the time, reported that nearly 500 merchant ships had been captured by Yankee privateers and commerce raiders.	37
Video 2 on Other High Seas Battles	Show video 2 on other high sea battles	38
British Sea Power Prevails	Explain that the early victories at sea had given the United States new pride and respect. By 1813, however, the British had driven the French from the sea, and they were therefore able to increase the number of ships patrolling the U.S. coast and blockading U.S. ports. Once they returned from their victories, few American warships could get to sea again for the duration of the war. Thus, after 1813 most of the burden of fighting the British at sea fell to the privateers.	39
British Sea Power Prevails	More than 500 of them were commissioned during the remainder of the war, most from Massachusetts, New York, and Maryland. Though they carried the war to the British and captured over 1,300 vessels by war's end, they could not take the place of a powerful navy. Explain that the Jeffersonians had claimed that no enemy could gather enough ships to blockade the entire U.S. coast, therefore it was not necessary to have a seagoing navy to protect seagoing commerce. The United States and its merchant marine paid a stiff price for that mistake.	40-41
The Great Lakes Campaigns	Explain that after war broke out in June 1812, a shipbuilding race between the British naval commander Sir James Yeo and his American counterpart, Commodore Isaac Chauncey took place on Lake Ontario. Both men had talent for building and organizing, but neither was willing to fight without overwhelming superiority. The result was a series of naval skirmishes throughout the war on the lake that decided nothing, and	42

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	blockade efforts that lasted only until the other side built a new and bigger ship. This went on until war's end, when both sides had two-decker 58-gun men-of-war and were building 110-gun dreadnoughts, larger than any in service on the ocean at the time. None of these, however, saw any significant action during the war.	
The Great Lakes Campaigns	Explain that because control of Lake Erie was key to control of the entire Northwest Territory, both sides saw it as an important objective in the early days of the war. Detroit had been surrendered to the British at the outbreak of war, and the British had control of the entire Northwest Territory down to Ohio, where American general William Harrison was sustaining a difficult defense against the British and their Indian allies. The British had a small squadron of armed vessels on the lake, but the Americans had no warships there at all. To remedy this situation, President Madison sent a contingent of shipwrights to Presque Isle (now Erie, Pennsylvania) to begin building a small U.S. fleet there. Later, twenty-seven-year-old Captain Oliver Hazard Perry was sent there to take operational command.	43
The Great Lakes Campaigns	Explain that when Perry arrived in the spring of 1813, he found things in a bad state. Work had begun on two twenty-gun brigs that would be better than anything the British had on the lake, but winter delayed their completion and fitting out until July 1813. Perry named one brig the <i>Niagara</i> , and the other the <i>Lawrence</i> for his good friend the late captain of the Chesapeake, and chose it for his flagship. Meanwhile, Commodore Yeo sent Commander Robert Barclay, a distinguished Trafalgar veteran, to command the British Lake Erie squadron.	44
Video on the Great Lakes Campaigns	Show video on the Great Lakes campaigns	45
The Great Lakes Campaigns	Explain that with his fresh new flagship, Perry steered across the British line, firing double-shotted broadsides for which the British had no real defense. One by one the British ships struck their colors, and at 1500, Barclay surrendered the remainder of his squadron. After returning to his shattered flagship <i>Lawrence</i> , Perry wrote the now-famous dispatch about the victory to General Harrison: "We have met the enemy and they are ours." Lake Erie was now firmly under American control. The Kentuckians pursued the retreating British and Indians, defeating them in the Battle of the Thames. Tecumseh was killed in this battle, ending support for the British cause. Detroit was thus recaptured, and the Northwest Territory was secured, eventually becoming the states of Ohio, Indiana, Illinois, Michigan, Wisconsin, and part of Minnesota.	46
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	47
The Final Year of the War	Explain that, as war was breaking out between the United States and Britain in 1812, the British and their allies were beginning to achieve success against Napoleon's forces in Europe. In December 1812 Napoleon's armies in Russia were virtually annihilated. His defeat at Leipzig in October, 1813 and his abdication of the French throne in April 1814, freed more and more British assets for deployment in the war against America. A large expedition against Louisiana was prepared. Another force was assembled to proceed to the Chesapeake Bay and attack Washington, D.C., and Baltimore.	48-49

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The Final Year of the War	<p>Explain that in the summer of 1814 ships of the Royal Navy entered the Chesapeake Bay, swept aside a small flotilla of Jeffersonian gunboats, and landed 4,000 troops without opposition on the west bank of the Patuxent River. From there they marched on Washington, overwhelming the militiamen trying to defend the city on 24 and 25 August. After government officials, including President Madison fled in panic, the British set fire to the White House, the Capitol, and other public buildings. They did this partly in retaliation for Americans burning several towns in Canada earlier in the war, as well as for the effect they thought such action would have on American morale. The Americans burned two warships at the Washington Navy Yard to keep them from falling into enemy hands.</p>	50
The Final Year of the War	<p>Explain that the British next turned their attention to Baltimore. They regarded this city as a “nest of pirates” because it was the home port of a great many privateers that had been raiding British merchantmen at sea. A British army of nearly 5,000 men stopped before the city’s defenses to wait for a fleet of frigates and bomb vessels to silence Fort McHenry, which was located at the entrance to the harbor.</p> <p>Explain that the night-long bombardment that began the evening of 13 September failed to bring down the U.S. flag waving defiantly over the fort. Francis Scott Key, a U.S. civilian being held aboard one of the British vessels, witnessed the stirring sight and wrote the words of “The Star-Spangled Banner,” which later became our national anthem. Unable to get past the fort, a few days later the British reboarded the troops on their ships and sailed away.</p>	51
Video 1 on the Final Year of War	Show video 1 on the final year of war	52
The Final Year of the War	<p>Explain that in the Montreal area, in the summer of 1814 Sir George Prevost, governor general of Canada, had 12,000 troops, including four brigades fresh from the Peninsular campaign against Napoleon. They were preparing to advance down into the United States along the old Lake Champlain route, used by Burgoyne during the Revolution. To oppose them the United States had only 1,500 troops stationed at Plattsburg on the western shore of the lake. A small naval squadron under the command of Master Commandant Thomas Macdonough, another of Preble’s Boys, assisted in the American defense.</p>	53-54
The Final Year of the War	<p>Explain the Naval Grades and Seniority in 1806 were as follows:</p> <ul style="list-style-type: none"> • Captain • Master Commandant • Lieutenant • Sailing Master • Master’s Mate • Boatswain • Midshipman 	55

Chapter 3 / Section 2: NS2-M1C3S2 – Toward War with England

The Final Year of the War	Explain that Prevost delayed his invasion in order to wait until the British gained control of the lake. Otherwise American naval guns would be able to dominate the lakeside road that Prevost had to use, and the American squadron could prevent use of the lake as a sea line of communication along which to resupply his invasion force. The British quickly built a naval flotilla made up of the frigate <i>Confiance</i> , thirty-seven guns, three smaller warships, and twelve gunboats to challenge Macdonough for control of the lake. Completely outgunned, Macdonough hastily built the twenty-six-gun corvette <i>Saratoga</i> , the twenty-gun brig <i>Eagle</i> , two sailing vessels, and ten gunboats, all in a little more than a month.	56
Video 2 on the Final Year of War	Show video 2 on the final year of war.	57
The Final Year of the War	Over two hours of close fighting had cost both sides hundreds of casualties. For the second time in the war, and only the second time in history, an entire British fleet had been defeated. Prevost beat a hasty retreat back to Canada the next morning.	58
The Final Year of the War	Explain that Macdonough's victory had a profound effect on peace negotiations, which had been taking place in Ghent for some time. The Duke of Wellington offered his opinion that the cost of any new offensive would vastly outweigh any probable gains, and that peace should be made at once, without demands for territory. The British government dropped their demand for territorial concessions and so notified the delegates at Ghent, thereby paving the way for conclusion of a peace treaty by year's end. On Christmas Eve 1814, the Treaty of Ghent was signed. It made no mention of impressments, or of neutral shipping rights at sea, the main reasons given by Madison for declaring war. These issues were no longer important, since the British had repealed the Orders in Council and the war in Europe was over.	59
Conclusion of War - Battle of New Orleans	Explain that news traveled slowly in the early nineteenth century. Thus, even though the peace treaty ending the war had been signed in Europe, fighting continued in America. The British expedition to Louisiana had finally arrived off the mouth of the Mississippi River on 8 December 1814, after having been delayed several weeks by privateer actions in the Azores. Soon the British had swept through a flotilla of gunboats and sailing vessels arrayed against them, and on 23 December, they landed 8 miles below New Orleans and began skirmishing with U.S. General Andrew Jackson and his defenders. By the end of the first week in January, more than 8,000 British veterans under Major General Sir Edward Pakenham were ashore and ready to attack. Upstream, Jackson's force had grown to 4,000 men, including a contingent of ex-pirate Jean Lafitte's men and a naval battery manned by gunners from the disabled schooner <i>Louisiana</i> .	60-61
Conclusion of War - Battle of New Orleans	Explain that on 8 January 1815 Pakenham foolishly marched his men in a frontal assault against Jackson's strong position between the Mississippi and a swamp where he had dug in to prevent encirclement. Jackson's riflemen firing from behind cotton bales and earthworks mowed the British down. When the smoke cleared, Pakenham and over 2,000 of his troops were dead or wounded, and the rest were in flight.	62
Conclusion of War - Battle of New Orleans	Explain that the peace treaty finally arrived in the United States on 11 February, and Congress ratified it six days later. By and large, the treaty was welcome in both countries, since they had much more to gain from trade with each other than from war. The U.S. Navy had won new respect throughout the world. American diplomats were again treated with respect. The victories of the navy both at sea and on the Great Lakes united the nation and started a great naval tradition. The United States at last stood as an equal among the powers of the world, respected as never before.	63

Chapter 3 / Section 2: NS2-M1C3S2 – Toward War with England

Video on Battle of New Orleans	Show video on Battle of New Orleans	64
Review Question	The Review Question is “List 2-3 benefits that the U.S. gained around the world from the War of 1812.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	65
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	66
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	67

III. Supplemental Activities -

A. In class Activity:

Supplies required: Handout for Take home activity

When: This is a good activity to do as an opening for this lesson.

- With the class: We hear in the news of countries invading other countries. How often has the United States been invaded? (2 times) When was the last time the contiguous United States was invaded? (War of 1812 by the British, the first during the revolution).
- Divide the class into groups of 4. Each of those groups will be made of two person teams who will be working together. Each group of four will develop a compare and contrast chart identifying factors of why many countries are repeatedly invaded, while others are not. One team from each group should develop a list of reasons for the countries that are invaded and the other team a list why countries are not (to include the United States).
- After the teams have developed several reason for either being invaded or not, have the teams compare the two different list that they have developed. What is the same or different in each list? So what factors do the groups think are the factors that affect invasion? Do the factors the groups selected apply to the United States? Do these factors support why the United States has only been invaded twice?
- Select one group to present to the class their findings. Did any other groups come up with a different reason?

Chapter 3 / Section 2: NS2-M1C3S2 – Toward War with England

B. Take Home Activity: What was Jefferson's gunboat Navy? How did Jefferson's and Congress' decisions about the Navy affect the war of 1812? Today's Navy is remaking itself. Is this the new gunboat Navy or modernization? Using the Handout, "Gunboat Navy", have the cadets write a 5 minute presentation about their position. X number (your choice) of students will be selected at random by CPS to make their presentation to the class. All students will turn in their presentation for review.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 3 / Section 2: NS2-M1C3S2 – Toward War with England

Activity 1: Take Home Activity- Gunboat Navy

Name: _____ Date: _____ Class: _____

Directions: What was Jefferson's gunboat Navy? How did Jefferson's and Congress' decisions about the Navy affect the war of 1812? Today's Navy is remaking itself. Is this the new gunboat Navy or modernization? Write a 5 minute presentation about your position.

Chapter 3 / Section 3: NS2-M1C3S3 – Advancing with Sea Power

(Section 3 of 4)

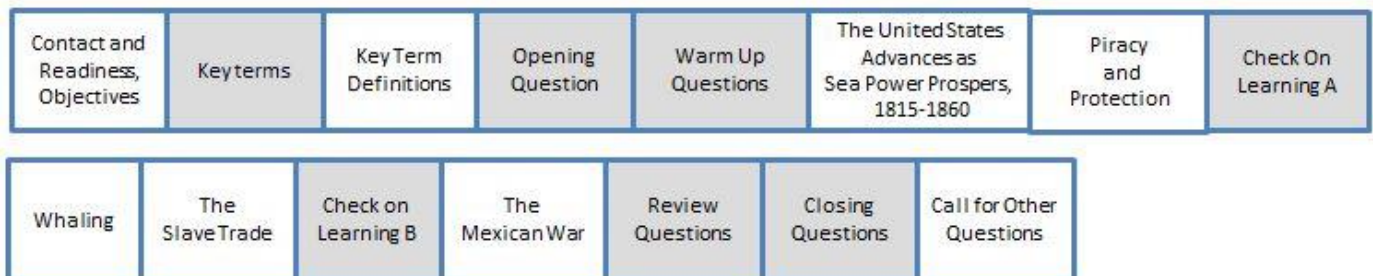
What Students Will Learn to Do:

Demonstrate an understanding of the Growth of American Sea Power from 1783 – 1860

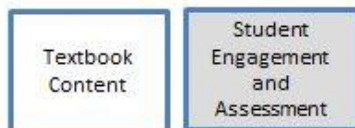
Skills and Knowledge to be Gained:

1. Explain how sea power influenced the spread of Western Civilization and the formative years of the new American republic
2. Explain the contribution the U.S. Navy made to the progress of world trade between 1815 and 1860
3. Describe the rapid growth and subsequent decline of the American whaling industry
4. Explain America's role in the slave trade
5. Explain the events that led to the beginning of the Mexican War and the significance of the Treaty of Guadalupe Hidalgo

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 3. Place a checkmark beside the NS2-M1C3S3 PowerPoint presentation, and these two CPS question deck files: NS2-M1C3S3 - Key Terms and NS2-M1C3S3 - Lesson Questions.

Chapter 3 / Section 3: NS2-M1C3S3 – Advancing with Sea Power

- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson you will learn about the “romantic” days of pirates and clipper ships, the era of American whaling, and shipbuilding and the American fishing industry. In 1816, a group of merchants formed a company called the Black Ball Line to transport passengers, mail, and freight between Liverpool, England, and New York on “packet” ships. We will look at how this affected our country’s development. Slave trade persisted until the mid-nineteenth century, despite laws to the contrary.</p> <p>We will study the slave trade, how it grew, America’s involvement, and the measures, which were taken to end the slave trade. Americans began moving into Texas in the 1820s while that territory was still a part of Mexico.</p> <p>We will look at that migration, the resultant Mexican War, and how it contributed to the American dream of a country stretching from coast to coast.</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is “List 2-3 reasons you think some Americans in the 1800’s supported slavery.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on advancing with sea power.	7
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	8
The United States Advances as Sea Power Prospers, 1815-1860	Explain that the nation and the Navy emerged from the War of 1812 stronger and more confident than ever. Within a few months of the Battle of New Orleans, hundreds of U.S. merchantmen plied the world trade routes.	9

Chapter 3 / Section 3: NS2-M1C3S3 – Advancing with Sea Power

The United States Advances as Sea Power Prospers, 1815-1860	Explain that many changes were to come in the business of seafaring. The Navy now enjoyed prestige and popularity because of its successes in the war. For the first time, the Navy was able to build up after the end of a war, with public support. Piracy demanded the attention of the Navy, especially in the Caribbean and Mediterranean. The desire to stop the international slave trade added other patrol duties. Commercial trade grew rapidly. Whaling became a major industry in New England ports. And some of the most “romantic” days in the history of sailing were about to unfold. American clipper ships would soon become the queens of the sea.	10-11
The United States Advances as Sea Power Prospers, 1815-1860	Explain that the age of technology began to have an effect on life at sea. The science of oceanography came into being. Better instruments, mapping, and clocks improved navigation and helped American firms compete for world trade. Steam propulsion came into the world of sea power. With it came the screw propeller, iron hull, armor, and heavy ordnance with the first rifled barrels. No major wars, and consequently no major sea battles, were fought between 1815 and 1860. For the first time, wars in Europe did not directly affect American progress. Americans went their way, across the seas and across the continent.	12-14
The United States Advances as Sea Power Prospers, 1815-1860	Explain that a large naval squadron sailed to the Mediterranean in the war with Algiers to wind up the unfinished business with the Barbary states. After so doing, the United States kept up its presence in the Mediterranean regularly until the Civil War	15
The United States Advances as Sea Power Prospers, 1815-1860	Explain that the U.S. Naval Academy was established at Annapolis, Maryland in 1845. This was in response to the growing demand for more capable officers and enlisted men. Explain that there was also a mutinous incident involving a midshipman on the USS Somers in 1842, which underscored the need for better training for the Navy.	16
Piracy and Protection	Explain that when revolts against Spain began in South and Central America in the early nineteenth century, piracy increased in the West Indies. Some of the new South American countries issued letters of marque (official documents commissioning vessels as privateers) to their ships. However, many of these ships began piracy against all shipping. This affected American shipping, for at this time New Orleans was developing into the second-largest port of the nation. This was a result of the westward migration and agricultural expansion in the Mississippi Valley.	17-18
Piracy and Protection	Explain that Jean Lafitte was the most notorious American pirate. He established his base on an island at the mouth of the Mississippi River. He and his men had been given pardons because of their assistance to General Jackson at New Orleans in 1815, but they returned to piracy after the war. The Navy was given the job of wiping out the pirates. At the same time, it had to deal with the Latin American governments and colonies from which many of the pirates came.	19
Piracy and Protection	Explain that between 1815 and 1822 nearly 3,000 merchant ships were attacked by pirates in the West Indies. Merchants, ship owners, and insurance companies demanded an end to these attacks. In 1819, Congress authorized President James Monroe to launch a campaign against the pirates. He sent Oliver Hazard Perry to Venezuela to talk with President Simon Bolivar about stopping the letters of marque. Bolivar agreed, but the piracy did not stop. The new governments had no power to stop the marauders already on the seas. Perry contracted yellow fever during his mission, and died the same year at the age of thirty-four.	20-22

Chapter 3 / Section 3: NS2-M1C3S3 – Advancing with Sea Power

Piracy and Protection	Explain that piracy continued to flourish. By 1822 the damage to American trade in the Caribbean became so great that the United States decided to put an end to the pirates once and for all. A West Indies Naval Squadron, under the command of Commodore James Biddle, was sent to the area. Biddle captured or destroyed thirty pirate vessels in less than a year, but his large ships could not pursue the smaller pirate vessels into the coves close to shore where many lurked. Spanish officials in Cuba and Puerto Rico refused Biddle permission to pursue pirates who beached their vessels and escaped ashore. Yellow fever and malaria caused many deaths in the American crews.	23-24
Piracy and Protection	Explain that in 1822 David Porter took command of the West Indies Squadron. Porter learned from Biddle's operations. He gathered a squadron of smaller vessels, gunboats, and the first steam-powered paddle wheeler to be used in naval operations. He then followed the pirates into the coves and inlets for the next two years. His larger ships escorted merchantmen at sea. By mid-1826 a new Commodore, Lewis Warrington, had succeeded in driving Lafitte and other pirates out of the Caribbean. For the first time in three centuries, the ships of all nations could sail those waters without fear of being plundered.	25-26
Check on Learning Questions A(Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	27
Whaling	Explain that Colonial Americans had begun whaling in the early 1700s. Sailing out of New Bedford, Nantucket, and other New England seaports, whalers flourished until the Civil War. After the War of 1812, the whaling industry grew rapidly. Between 1830 and 1860, many fortunes were made by the owners of whaling vessels. By 1846 the Americans had over 700 whaling ships, about three-quarters of the total world's whaling fleet.	28-29
Whaling	Explain that life aboard the whaling ships was primitive and dirty. Many crewmen died from disease and injuries, but the lure of profits from a share of a successful voyage pushed men on. Many sea stories of the era have been passed down from writers of the day and have become a part of American history and adventure. Probably the most famous of these stories is Moby Dick, by Herman Melville.	30
Whaling	Explain that the era of American whaling ended with a series of important developments. The principal products made from whales were whale oil for lighting, whalebone, spermaceti for candles, and ambergris for perfume. In 1859 oil was discovered in Pennsylvania, giving momentum to the fledgling petroleum industry. Petroleum could be distilled into kerosene and used for lighting and heating. Later, lighting by natural gas dealt the final blow to whalers. The flexible whalebone used for hoopskirts, corset stays, buggy whips, and umbrella ribs was replaced by other materials as dress styles and needs changed. During the Civil War, Confederate raiders attacked and destroyed many Northern whaling fleets, and the trade never revived. Weather and the Arctic ice claimed most of the surviving American whaling fleet in the 1870s.	31-32
The Slave Trade	Explain that unfortunately, another much less praiseworthy and more infamous triangular trade developed during the 1700s: the slave trade. This persisted until the mid-nineteenth century, despite laws in both the United States and Britain to the contrary. Much of the wealth and prosperity of New England in the eighteenth and early nineteenth centuries was founded on the slave trade. The rich businessmen and ship owners and their families never saw the loads of human misery for which they were responsible. Even though it was contrary to the law, the slave trade persisted until the mid-19th century.	33-35

Chapter 3 / Section 3: NS2-M1C3S3 – Advancing with Sea Power

The Slave Trade	Explain that in North America this triangular slave trade most often originated in the New England colonies, from which the slave ships sailed, loaded with rum made in New England's distilleries from West Indies molasses. The ships sailed to West Africa, where the rum was exchanged for slaves, and the slaves were taken to the West Indies and sold. Then another cargo of sugar and molasses would be carried back to New England. The equatorial route across the Atlantic Ocean from Africa was called the Middle Passage. Many slaves died during this voyage due to the terrible conditions on board the slave ships. Over 15 million black Africans were transported to slavery in the Americas over this route.	36-40
The Slave Trade	Explain that following the War of 1812, the British made treaties with most European nations that allowed Royal Navy ships to search and capture any of their vessels involved in the slave trade. The United States refused to sign such a treaty, partly because of their recent sad experience with British impressment of sailors. But it was also a result of political pressures in Congress by southern planters and New England slavers, who were becoming wealthy through the illegal trade. The result was that other nations' slavers would often hoist the U.S. flag when the Royal Navy was in the area on antislavery patrol.	41
The Slave Trade	Explain that in 1819 the U.S. Navy was authorized to conduct antislavery patrols off the African coast in the Gulf of Guinea. It was here that the slave-trading posts were set up in what now are the countries of Liberia, Ivory Coast, Ghana, and Togo. In 1820 a federal law was passed that defined the carrying of slaves as an act of piracy, making it punishable by death. At the same time, the Navy was assigned the task of helping resettle freed blacks in a new country they named Liberia, in recognition of the liberty of the freed slaves. These people named their capital Monrovia after President James Monroe, who helped them start their new country.	42-44
The Slave Trade	Explain that the antislavery patrols were not very successful. Involvement in the Liberian venture and the unpopularity of the patrol in Congress were the main reasons. The campaign against piracy in the Caribbean, which was going on at the same time, was given more support than antislavery operations. In 1824 the United States withdrew its patrol because of a dispute with the British over rights of visit and search at sea. As soon as the patrol had gone, the slavers again took cover under the American flag, much to the frustration of the Royal Navy.	45
The Slave Trade	Explain that not until the Webster-Ashburton Treaty with Britain in 1842 did the United States send a formal African squadron to cooperate with the British in stopping the slave trade. This effort too was only half-hearted. American naval officers considered the slave trade a terrible business and wanted to stamp it out. But they were handicapped by lack of support in Congress, which was heavily influenced by the southern proslavery politicians. Also, American juries often failed to convict captured slavers, making the Navy's task even more difficult.	46-47
The Slave Trade	Explain that between 1845 and 1850 the U.S. Navy captured only 10 slavers, carrying about 1,000 captives. The Royal Navy took more than 400 prizes with 27,000 African captives in the same period. Clearly, the American naval squadron made only a small dent in the slave traffic. Both Americans and British returned the captives to Africa, where they were freed. American ships and capital, as well as foreign ships illegally flying the Stars and Stripes, continued the slave trade until the start of the Civil War in 1861.	48
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	49

Chapter 3 / Section 3: NS2-M1C3S3 – Advancing with Sea Power

The Mexican War	Explain that Americans began moving into Texas in the 1820s, when that territory was still a part of Mexico. By 1835 nearly 30,000 Americans had moved into the area, and many problems had started with the Mexican government. After a year of skirmishing, Texans declared their independence and organized the Republic of Texas with its “Lone Star” flag. In February 1836 Mexican forces under General Santa Anna entered Texas and overran a small Texan garrison at the Alamo near San Antonio, killing all the defenders. Rallying under the cry “Remember the Alamo!” Sam Houston and 800 Texans routed the Mexican army and captured Santa Anna at the Battle of San Jacinto about six weeks later. In April 1836 Santa Anna recognized Texan independence.	50-53
The Mexican War	Explain that Texas remained a “hot spot” during the next ten years, however. American settlers poured into Texas, and the new government claimed the Rio Grande as its southern border. In 1845 Texas was admitted to the Union, and U.S. troops under General Zachary Taylor moved to garrison the Rio Grande boundary. In April 1846 a Mexican force crossed the river and attacked elements of Taylor’s command, inflicting a dozen casualties and capturing some soldiers. Taylor responded by invading Mexico and capturing the border town of Matamoros. A few days later, President James K. Polk called on Congress to declare war on Mexico. Both houses of Congress voted by a large majority for war on 13 May 1846.	54
The Mexican War	Explain that a four-ship naval squadron in the Pacific, under command of Commodore John Sloat, was operating off the coast of California when war was declared. Sloat’s forces went ashore at Monterey, the capital of Mexican California, occupied the city without a fight, and raised the American flag. A day later, on 8 July 1847, another naval force, under the command of Commander John Montgomery, took possession of Yerba Buena (later San Francisco).	55
The Mexican War	Explain that the naval forces then joined land forces that had fought their way across the New Mexico–Arizona territory into California, defeating poorly organized Mexican forces on the way. The small American force proceeded to capture Los Angeles, San Diego, Santa Barbara, and other California settlements. The Mexican defense force signed the Treaty of Cahuenga in early 1847, giving California to the United States.	56
The Mexican War	<p>Explain that the United States had now brought the entire Southwest under the protection of the American flag, and for all practical purposes had won the war. The Mexican government, however, did not recognize the American victories, so President Polk planned to carry the war into the heart of Mexico. Zachary Taylor’s army, though greatly outnumbered, spent the next few months defeating Mexican forces in a number of battles in northeastern Mexico. This was not enough to conclude the war, so Polk ordered General Winfield Scott to assemble an army of 14,000 men to take the capital, Mexico City.</p> <p>Explain that since Mexico had no navy, there were no sea battles. Nevertheless, sea forces had to carry out the operations leading to a successful end to the war. Scott’s army was loaded in army transports and sailed to join with the Navy’s Home Squadron, which was blockading Mexico’s east coast. The transports and the Home Squadron met at Veracruz in March.</p>	57
The Mexican War	Explain that in the largest U.S. amphibious operation carried out before World War II, over 100 ships landed the American force without losing a man. Included in the landing were 1,200 sailors and Marines. As the ground forces surrounded Veracruz, the Navy took up bombardment positions off the major Mexican fort. A naval battery was sent ashore to aid the army in its bombardment of the city. The fort and the city were pounded into submission in less than two weeks.	58-59

Chapter 3 / Section 3: NS2-M1C3S3 – Advancing with Sea Power

The Mexican War	Explain that with the port in American hands and supply lines clear, Scott and his army swept into Mexico. A series of tough engagements were fought before the Army and Marines captured Mexico City on 14 September 1847. It is this military operation that is remembered in the beginning line of the Marine Hymn, “From the Halls of Montezuma.” The red stripe on the Marine trousers (non-commissioned officers and above) commemorates the blood shed by the Marines in the Battle of Chapultepec in 1846.	60
The Mexican War	Explain that the Treaty of Guadalupe-Hidalgo ended the Mexican War in February 1848. By its terms, Mexico recognized the U.S. annexation of the New Mexico–Arizona Territory and California, and set the Rio Grande as the U.S.–Mexican border. The United States had now reached its second seacoast.	61
The Mexican War	Explain that this realized the American “Manifest Destiny,” the dream of a country stretching from coast to coast, and was the most important result of the Mexican War. As always, such a great victory meant both immense benefits and increased responsibilities for the American people. A navy would now have to be maintained in the Pacific to defend the nation’s new shores and to protect the many merchant ships that were soon to ply the trade routes to Asia.	62
Review Question	The Review Question is “List 2-3 reasons that piracy flourished in the mid 1800’s.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	63
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	64
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	65

III. Supplemental Activities -

A. In class Activity:

Supplies required: Take Home Handout – Pirates of the Caribbean

When: This is a good activity to do the start of class or before the triangular trade route discussion.

- With the class: During this period US trade rapidly grew and the United States prospered. During this lesson we will be discussing the triangular trade route, and slavery becomes an issue. Divide the class into three groups representing: The US government, US population, and the US Navy.

Chapter 3 / Section 3: NS2-M1C3S3 – Advancing with Sea Power

The US government did not sign any treaties allowing other countries to search US ships. Other countries are illegally flying the US flag so that they cannot be searched and can carry slaves.

The northern shipping companies are making their money trading rum to West Africa, slaves for molasses in the West Indies and back to the US with the molasses.

The US Navy has conducted anti-slavery patrols off of West Africa, but has been directed to focus the Navy assets in the Caribbean to fight piracy.

Class question: When was the slave trade outlawed by the United States? March 2, 1807, which is more than 50 years before the civil war. Remind the class that this was not the Thirteenth Amendment which was passed by the Senate on April 8, 1864, by the House on January 31, 1865, and adopted on December 6, 1865. It was not illegal to own a slave or buy and sell slaves within the United States, however it was illegal to bring slaves to the United States or to bring slaves from West Africa.

Now each group needs to determine what one or two items it wants the other two groups to do that will benefit their group. (Example: The northern shipping companies might want the government's anti-piracy patrols to protect its trade routes and not want the US Navy to search, or allow any other country's navies to search, their ships.) Each group will have 5 minutes to discuss their position and select one person to present their position. Remind the groups they are representing the group based on the group's well-being and early 1800 beliefs.

For the entire class: If you are only dealing with molasses and rum does the slavery matter? Did you know that the ships were owned by Northern shipping companies, does slavery matter now?

B. Take Home Activity: Pirates of the Caribbean - Today we talked about pirates and how the United States Navy was able to virtually eliminate the threat of piracy in the Caribbean. On a map of the world, highlight the areas where piracy is taking place. Each area should be labeled with who or where the pirates operating in that region tend to be from. Additionally, several of these areas have deployed naval forces protecting shipping. List the countries that have naval assets in those areas conducting anti-piracy operations. Is piracy against international law?

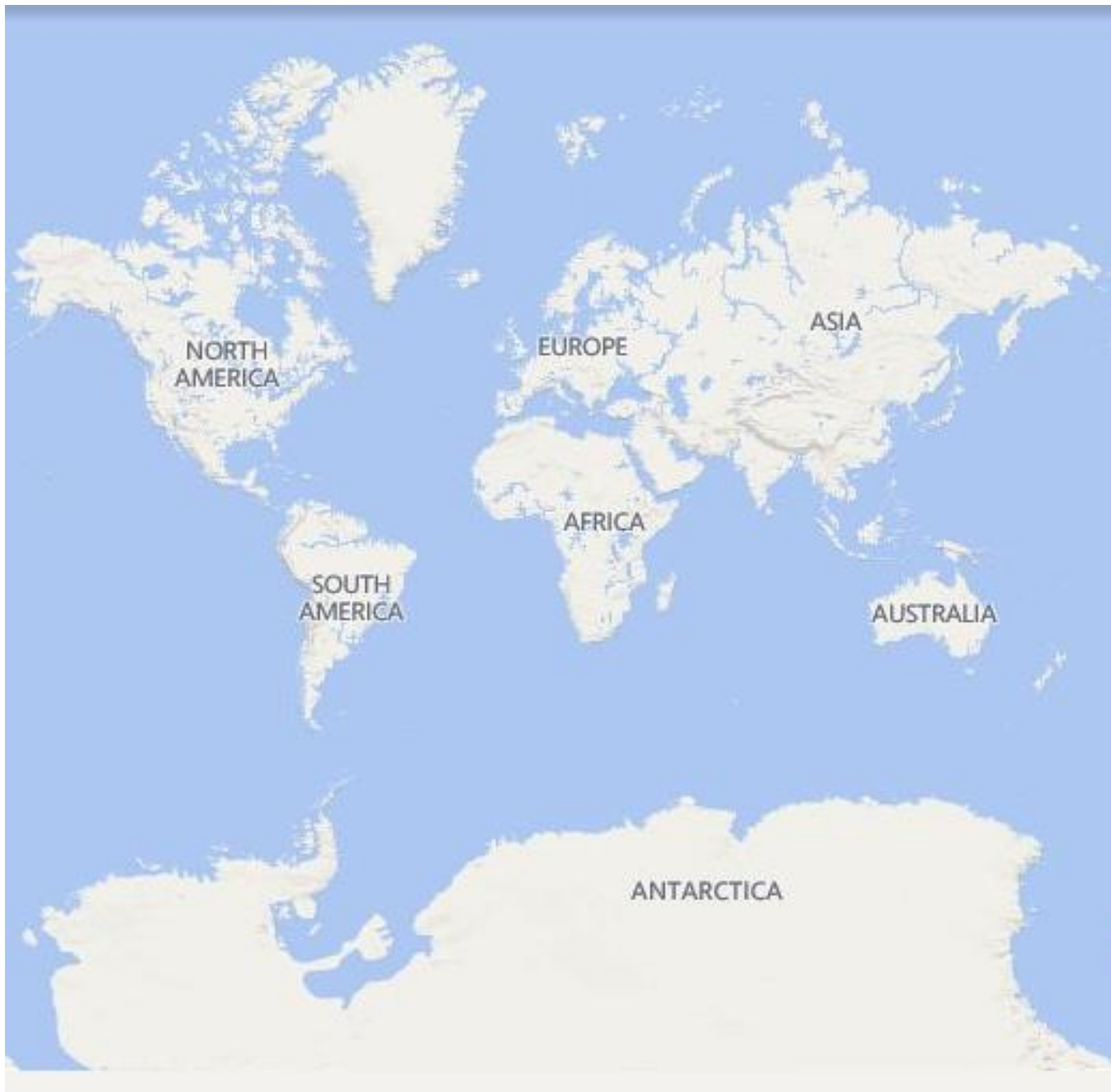
IV. Evaluation - see CPS database for chapter test questions.

Chapter 3 / Section 3: NS2-M1C3S3 – Advancing with Sea Power

Activity 1: Take Home Activity – Pirates of the Caribbean

Name: _____ Date: _____ Class: _____

Today, we talked about pirates and how the United States Navy was able to virtually eliminate the threat of piracy in the Caribbean. On a map of the world, highlight the areas where piracy is taking place. Each area should be labeled with where the pirates operating in that region tend to be from. Additionally, several of these areas have deployed Naval forces protecting shipping. List the countries that have naval assets in those areas conducting anti-piracy operations. Is piracy against international law?



Chapter 3 / Section 4: NS2-M1C3S4 – Clipper Ships and Japan

(Section 4 of 4)

What Students Will Learn to Do:

Demonstrate an understanding of the Growth of American Sea Power from 1783 – 1860

Skills and Knowledge to be Gained:

1. Describe the effects the clipper ships had on trade with China
2. Explain the purpose of Commodore Perry's mission to Japan

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	The Clipper Ships	Check On Learning A	Opening the Door to Japan (A)
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Check on Learning B	Opening the Door to Japan (B)	In Summary	Review Questions	Closing Questions	Call for Other Questions
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Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 3. Place a checkmark beside the NS2-M1C3S4 PowerPoint presentation, and these two CPS question deck files: NS2-M1C3S4 - Key Terms and NS2-M1C3S4 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 3 / Section 4: NS2-M1C3S4 – Clipper Ships and Japan

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, you will learn that just as the Mexican War was about to start in 1845, America entered the colorful and dramatic era of the clipper ships. Clipper ships were the most beautiful ships ever to sail the seven seas, and in their time, they were also the fastest. We will look at how the clipper ship improved trade with China. With the Chinese trade established, the next objective of American sailors was Japan. Japan had a history of isolationism; they did not want “foreigners” on Japanese soil. Commodore Matthew Calbraith Perry headed a Naval squadron to Japan that opened Japanese ports to American shipping.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5
Opening Question(Random Pick a Student – “RPS”)	<p>This Opening Question is, “How do you think that Clipper ships were different from earlier ships?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on clipper ships and Japan.</p>	6
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	7
The Clipper Ships	Explain that just as the Mexican War was about to start in 1845, the most colorful and dramatic era of sailing ships began. The square-rigged clipper ship Rainbow slid down the ways in New York that year. The era of the clipper ships was beginning.	8
The Clipper Ships	<p>Explain that as early as 1784, American ships had been taking part in the China trade. By 1825, American trade with China was second only to that of England. The U.S. Navy established the East Indian Squadron to protect American ships and interests in the Pacific. In 1840 this rich commerce stopped during the Opium War between China and Britain. Trade was reopened in 1842, when Commodore Lawrence Kearny sailed into Canton, China, with the <i>USS Constellation</i> and <i>USS Boston</i> of the East India Squadron. Kearny used a combination of courtesy, firmness, fairness, and show of force to lay the foundation for a successful trading treaty that was signed by China and the United States a year later.</p>	9-10

Chapter 3 / Section 4: NS2-M1C3S4 – Clipper Ships and Japan

The Clipper Ships	Explain that the trade with China always involved a race against time. In the early days, it took as much as a year and a half for a round trip between New England and China. The Chinese trade offered tea, silk, porcelain, ivory, and other luxuries. Profit was so great that one successful trip would pay for a ship.	11
The Clipper Ships	Explain that time was important, especially for tea, which could spoil on a long trip. Therefore, Yankee shipbuilders sought to build a ship that would cut the sailing time to China. The clipper ship was their answer. The clippers were the most beautiful ships ever to sail the seven seas. In their time, they were also the fastest. By the 1850s, American “China clippers” were sailing from New York to Hong Kong in about ninety days. In 1845, the <i>Rainbow</i> , mentioned earlier, was the fastest ship in the world, having made the trip home to New York from Canton in eighty-eight days.	12
The Clipper Ships	Explain that at the same time the China trade began to make great fortunes in New England, the Mexican War ended and opened the Pacific Coast to American shipping. Later that year, gold was discovered in California. Now the clipper-ship builders had another great demand: to bring supplies and passengers to San Francisco. The beautiful ships were used to haul thousands of gold seekers between East Coast ports and California.	13
The Clipper Ships	Explain that the clippers had their greatest year in 1853, when 145 of them sailed for San Francisco. In all, 161 clippers were launched between 1850 and 1855. Then the shipbuilding boom collapsed. Clippers were expensive to build and maintain. Their rapid decline was caused partly by the completion of a railroad across the Isthmus of Panama in 1855. This made the long, dangerous trip around South America unnecessary. Over the much shorter distance, larger and slower ships could haul bulk cargoes and more passengers much more cheaply. With profits down, the fast clippers could not carry enough cargo to make further construction of this type of ship worthwhile.	14-15
The Clipper Ships	Explain that other things happening in America and in the world at this same time also affected merchant shipping. Steamships began to overtake sail as the preferred means of sea transport. Then, in 1858, the first transcontinental stagecoach made the trip from St. Louis to San Francisco. This brought a complete change of attitude in America.	16-17
The Clipper Ships	Explain that in the early years of the nation’s independence, young, energetic Americans and businessmen had turned toward the sea for adventure and fortune. Now, the great expanse of the American West beckoned. Farms, cattle, mining, lumbering, land speculation, and railroads captured America’s imagination. Further, in the late 1850s, the turmoil of the Civil War was about to break loose, turning the people’s attention to internal affairs. As the clipper ships moved off the American historical stage, all other aspects of American life began to change.	18
Check on Learning Questions A(Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	19
Opening the Door to Japan	Explain that with the reopening of the China trade in 1842, the next objective of American Sailors was Japan. After a brief relationship with Portuguese traders Japan had driven all foreigners out of the country. Except for Chinese traders and a few Dutch envoys, no foreigners were allowed in Japan during the 215 years after 1637. Explain that in fact, a Japanese law in 1825 decreed that any foreign ship that attempted to anchor in a Japanese harbor was to be destroyed. Any seamen coming ashore were to be arrested or killed. Any Japanese who left to visit a foreign country	20-21

Chapter 3 / Section 4: NS2-M1C3S4 – Clipper Ships and Japan

	was to be killed upon his return. Such isolation, of course, kept Japan in a feudal state, with few technological, scientific, or social advances.	
Opening the Door to Japan	Explain that cultural misunderstandings impeded U.S.–Japanese relations as well. When the U.S. East India Squadron tried to open the trade door in 1846, Commodore James Biddle was treated in an insulting manner. When pushed by a Japanese guard, he chose not to make an issue of the matter. He was not aware that this caused him to “lose face”—a major shortcoming in Asian culture. Afterward, the Japanese would not even consider talking with such a “weak” individual, so Biddle’s trade proposals were rejected and his ships were towed out to sea.	22
Opening the Door to Japan	Explain that two years later, when the Navy sloop <i>Preble</i> called at Nagasaki to pick up fifteen shipwrecked American whalers, the commanding officer found the Japanese still bragging about their “victory” over Biddle. Commander James Glynn decided quick action was the only answer to such behavior. He threatened to bombard Nagasaki if the whalers were not released within two days. The whalers were safely turned over, and the <i>Preble</i> sailed away without further problems.	23
Opening the Door to Japan	Explain that the lure of the Japanese market, the need for a coaling station for ships crossing the Pacific to China, and demands for protection of shipwrecked sailors caused America to want an open door to Japan.	24
Opening the Door to Japan	<p>President Millard Fillmore chose Commodore Matthew Calbraith Perry to head a Naval squadron to Japan. Perry, the younger brother of Oliver Hazard Perry, the hero of Lake Erie, was the perfect man for the job. He had more diplomatic experience than any other Naval Officer. He had forty-four years of Naval service and had taken part in most important Naval actions since 1808. Perry’s mission was to carry a letter from the president to the emperor of Japan and to conclude a treaty that would satisfy all three main American interests</p> <p>Explain that Perry’s seven ships sailed in November, 1852 from the United States and met in Hong Kong the following spring. Leaving three ships in Okinawa, he entered Japanese waters with his steam frigates and anchored at the entrance to Tokyo Bay on 8 July, 1853. The Japanese had never seen steamships, and they could not fail to be impressed with the fact that Perry had all guns loaded and readied for action.</p>	25
Opening the Door to Japan	<p>Explain that having arrived, Perry put into practice all the things he had learned from previous attempts to trade and negotiate with the Japanese. He ordered away the Japanese guard boats and refused to deal with anyone whose rank was lower than his own. He made it clear that he would entrust President Fillmore’s letter only to a member of the Imperial family. For a week, the Commodore refused to allow himself to be seen, while the Japanese fretted and debated about what was to be done.</p> <p>Explain that finally, on 14 July, the Japanese sent the Prince of Izu, one of the Imperial Counselors, to act on the Emperor’s behalf. They set up a fine pavilion on the shore to receive Perry. Perry moved his squadron closer to shore, where the Japanese could easily see that this mission of peace was well supported by the equipment for war. Perry realized the importance of ceremony and “face” in conducting affairs with the Japanese.</p>	26
Check on Learning Questions B (Lesson questions 5-6)	Check in on students’ understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	27

Chapter 3 / Section 4: NS2-M1C3S4 – Clipper Ships and Japan

Opening the Door to Japan	Explain that a thirteen-gun salute echoed over the anchorage as Perry stepped into his barge. One hundred Marines in well-starched dress uniforms, a company of seamen, and two Navy bands preceded the barge in fifteen gunboats, serving as a guard of honor. Perry was flanked by two huge African American seamen who served as bodyguards, the first black persons the Japanese had ever seen. In front of them marched two young midshipmen carrying the President’s letter in a beautiful rosewood box.	28-29
Opening the Door to Japan	Explain that after the letter was delivered to the Prince, Perry announced that the squadron would depart for China in a few days but would return in the spring with more ships for a reply to the president’s letter. Explain that he returned in February with a much larger squadron. The Japanese had been convinced by the first visit that America was a nation worthy of trade.	30
Opening the Door to Japan	Explain that after more than a month of detailed talks, the Japanese and Americans signed the Treaty of Kanagawa in March, 1854. It provided for the opening of the ports of Shimoda and Hakodate to American shipping, the protection of shipwrecked American seamen, start-up of an American consulate at Shimoda, and granting of most-favored-nation status (reduction or elimination of trade barriers such as tariffs, and other favorable trade provisions) to the United States. This latter provision enabled a trade agreement to be signed two years later. That completed the opening of Japan to commerce with foreign nations.	31
Opening the Door to Japan	Explain that the Perry mission was regarded as the most important “peacetime battle” of the nineteenth century for the U.S. Navy. Perry was showered with honors upon his return to America. The great American author Washington Irving wrote of his exploit, “You have gained yourself a lasting name, and have won it without shedding a drop of blood or inflicting misery on a human being.” Truly a new era was about to dawn for America as a trading nation in the Pacific, and the U.S. Navy had helped make it possible.	32-34
In Summary	<div>Chronology</div> <div><div>1783</div><div>Treaty of Paris</div></div> <div><div>1789</div><div>U.S. Constitution adopted</div></div> <div><div>1794</div><div>Navy Act passed</div></div> <div><div>1798-1800</div><div>Quasi-War with France</div></div> <div><div>1801-5</div><div>War with Tripoli</div></div> <div><div>1807</div><div>Chesapeake affair</div></div> <div><div>1812</div><div>War of 1812 begins</div></div> <div><div>19 Aug. 1812</div><div>Constitution vs. Gurrière</div></div> <div><div>10 Sept. 1813</div><div>Battle of Lake Erie</div></div> <div><div>24-25 Aug. 1814</div><div>Washington burned</div></div> <div><div>11 Sept. 1814</div><div>Battle of Lake Champlain</div></div> <div><div>13 Sept. 1814</div><div>Baltimore attacked</div></div> <div><div>24 Dec. 1814</div><div>Treaty of Ghent</div></div> <div><div>8 Jan. 1815</div><div>Battle of New Orleans</div></div> <div><div>1830-60</div><div>American whaling flourishes</div></div> <div><div>1846-48</div><div>War with Mexico</div></div> <div><div>1845-55</div><div>Era of the clipper ships</div></div> <div><div>1854</div><div>Treaty of Kanagawa with Japan</div></div> <div></div> <td>35-37</td>	35-37

Chapter 3 / Section 4: NS2-M1C3S4 – Clipper Ships and Japan

Review Question	The Review Question is, “List 2-3 reasons why it was important for Perry to understand the culture of the Japanese people during negotiations.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS (Random Pick a Student) mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	38
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	39
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	40

III. Supplemental Activities -

A. In Class Activity:

Supplies required: None

When: This is a good activity to do at the start of class.

- With the class: Divide the class into 3 groups. Have the 1st group exit the class room and explain to them that they need to come back into the room in 1 minute. While that group is waiting outside explain to the other two groups that there is no requirement to return as a group or individually. When each of the students enters the room from the 1st group, the members of group 2 and 3 should write down what impression the members of group 1 made when they entered. When the first group starts to re-enter the room, randomly select a student and have them go back outside and return again.
- Now tell the returning students that they were evaluated on their entrance by the rest of the class. Now repeat the process for groups 2 then 3.
- Class question: What general impression did you have of the first group that entered the room? Did the second and third group change the way that they entered? Did any of the groups decide to make a 'grand' entrance for one of their members or individually? Do 1st impressions matter?

B. At Home Activity: Today, you learned how the US Navy paved the way for opening trade routes, specifically with Japan. The US Navy still carries on this proud tradition of good will and being a tool for diplomacy. What does the US Navy do today to increase good will with other nations? How else is the US Navy used in a positive diplomatic manner? You should be able to compare what you have learned today in class with what the US Navy is doing in the world today.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 3 / Section 4: NS2-M1C3S4 – Clipper Ships and Japan

Take Home Activity- The Navy Today

Name: _____ Date: _____ Class: _____

Directions: Today, you learned how the US Navy paved the way for opening trade routes, specifically with Japan. The US Navy still carries on this proud tradition of good will and being a tool for diplomacy. You should be able to compare what you have learned today in class with what the US Navy is doing in the world today

In a short paragraph, answer the questions below:

1. What does the US Navy do today to increase good will with other nations?
2. How else is the US Navy used in a positive diplomatic manner?

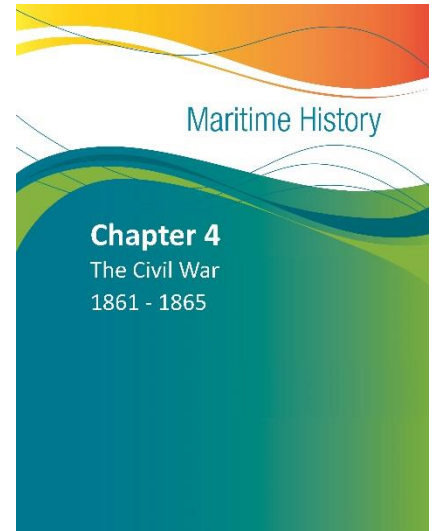
Module 1 Chapter 4: NS2M1C4 – The Civil War 1861 - 1865

What Students Will Learn to Do:

Demonstrate knowledge of the Civil War, 1861 – 1865

Skills and Knowledge to be Gained:

1. Describe how the issue of slavery divided the North and South and led to the outbreak of the Civil War in 1861
2. Describe the major events that occurred during 1860-61 in America
3. Describe the resources of both the North and the South and the preparations required to fight the Civil War
4. Describe the role of the Union Navy during the Civil War
5. Describe the acts of defeat and diplomacy used during the Civil War
6. Explain the importance of the river campaigns of the Civil War
7. Explain the significant events that took place during the Battle of New Orleans
8. Describe the CSS Virginia (formerly USS Merrimack) and the USS Monitor
9. Describe the major events that occurred during the Battle of Hampton Roads
10. Describe how General Robert E. Lee was able to prolong the life of the Confederacy after the Battle of Hampton Roads
11. Describe the Emancipation Proclamation as a significant psychological move for the North in the Civil War
12. Describe the major events that occurred during the Battle of Vicksburg
13. Describe the Battle of Gettysburg as the turning point in the Civil War
14. Explain the role that Charleston played in the Civil War
15. Explain the purpose of the David and the Hunley
16. Explain the purpose of the Confederate privateers during the Civil War
17. Explain the role that Captain Semmes and the CSS Alabama played in the Civil War
18. Describe three major events that occurred during the Battle of Mobile Bay
19. Describe the naval amphibious assaults on Fort Fisher in Wilmington NC during the Civil War
20. Explain the primary reason General Robert E. Lee was forced to surrender
21. Explain the changes to American life that occurred during or as a result of the Civil War



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Writing

- W.9-10.1. Write arguments to support claims in an analysis of substantive topics or texts...

Module 1 Chapter 4: NS2M1C4 – The Civil War 1861 - 1865

- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.2. Integrate multiple sources of information presented in diverse media or formats...
- SL.9-10.3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric...

Language

- L.9-10.3. Apply knowledge of language to understand how language functions in different contexts...
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Civic and Political Institutions

- D2.Civ.9.9-12. Use appropriate deliberative processes in multiple settings.
- D2.Civ.13.9-12. Evaluate public policies in terms of intended and unintended outcomes, and related consequences.
- D2.Civ.14.9-12. Analyze historical, contemporary, and emerging means of changing societies, promoting the common good, and protecting rights.

Dimension 2. Geography

- D2.Geo.2.9-12. Use maps, satellite images, photographs, and other representations...
- D2.Geo.5.9-12. Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...
- D2.His.2.9-12. Analyze change and continuity in historical eras.
- D2.His.14.9-12. Analyze multiple and complex causes and effects of events in the past.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 4 / Section 1: NS2-M1C4S1 – Introduction to the Civil War

(Section 1 of 3)

What Students Will Learn to Do:

Demonstrate knowledge of the Civil War, 1861 – 1865

Skills and Knowledge to be Gained:

1. Describe how the issue of slavery divided the North and South and led to the 1861 outbreak of the Civil War
2. Describe the major events that occurred in America during 1860-61
3. Describe the resources of both the North and the South and the preparations required to fight the Civil War
4. Describe the role of the Union Navy during the Civil War
5. Describe the acts of defeat and diplomacy used during the Civil War
6. Explain the importance of the river campaigns of the Civil War

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	The Issue of Slavery	The Events of 1860-61 (A)
Video The Events of 1860-61	Check On Learning A	The Events of 1860-61 (B)	Resources and Preparations (A)	Video Resources and Preparations	Resources and Preparations (B)	Check on Learning B	Navy Role: Blockade
River Campaigns (A)	Video1 River Campaigns	River Campaigns (B)	Video2 River Campaigns	River Campaigns (C)	Review Questions	Closing Questions	Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 4 / Section 1: NS2-M1C4S1 – Introduction to the Civil War

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 4. Place a checkmark beside the NS2-M1C4S1 PowerPoint presentation, and these two CPS question deck files: NS2-M1C4S1 - Key Terms and NS2-M1C4S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will discuss the factors that led to the Civil War and the resources available to each side. We will cover key battles, naval conflicts, and new naval construction that changed the face of naval warfare forever. By the 1840s, the United States had crossed the North American continent, the Canadian boundaries had been established, and foreign threats to the United States had been virtually eliminated. America concerned itself with overseas trading. For years, slavery had been declared illegal. Periodically, attempts were made to help the British stop the slave trade. Still, slavery haunted American life and commerce. Slavery had become a major political issue as new states joined the Union from western territories. There were repeated debates and compromises in Congress on the issue of slavery. The issue of slavery was both commercial and moral. Slavery had become the mainstay of the South's agricultural economy, while the North had developed a mechanized, industrial economy. These conflicting interests between the free northern states and the southern states could not be reconciled. The result: CIVIL WAR!</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "List 2-3 reasons why you think people from the North and South had such different opinions on slavery." Since this is a discussion question, it can be engaged using the RPS function. The CPS will display one student's name or clicker number, chosen randomly. The student selected will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on the Civil War	7

Chapter 4 / Section 1: NS2-M1C4S1 – Introduction to the Civil War

Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question with follow-up discussion based on responses as appropriate.</p>	8
Introduction	<p>Explain that by the late 1840s, the United States had crossed the North American continent. This was a result of both the Mexican War and the lure of gold and fertile farmlands in the western territories. The Canadian boundaries had been established in Oregon Territory. The U.S. Navy had beaten the Barbary states in the Mediterranean and the pirates in the Caribbean. The threat of a foreign attack on U.S. territory had been eliminated, so American maritime interests concerned themselves with overseas trade. Clippers, whalers, and packet ships loaded with immigrants captured the imagination of Americans. But one other thing haunted American life during the first half of the nineteenth century: slavery.</p>	9-10
The Issue of Slavery	<p>Explain that the issue of slavery was not of prime importance to the average American of the early 1800s: The majority of Southerners were small farmers who could not afford slaves. Most Northerners were small farmers or tradesmen who had never come into contact with slaves. Many influential plantation owners and politicians in the South had a vested interest in the issue. The cultivation and harvesting of tobacco, rice, indigo, and most importantly, cotton, on which most of the Southern economy depended, would not be profitable without slavery. In contrast, the Northern economy was based on commerce and industry far more than on agriculture. Consequently, many influential politicians and abolitionists in the North regarded slavery as a moral evil. As time progressed, these regional views spread throughout the respective populations of the North and South.</p>	11-12
The Issue of Slavery	<p>Explain that in 1800, the population of the country was about evenly split between North and South. Over the next fifty years, immigrants from Europe steadily added to the population of the North, while Southern population growth stagnated. By 1850, only about a third of the national population would live in the South. Southern politicians soon became alarmed at the loss of political power in the House of Representatives caused by this trend, especially in light of the prospective addition of new states formed from the territories of the Louisiana Purchase of 1803. They were concerned that if parity in the Senate were not maintained, their political power would wane and their entire way of life in the South would be threatened. Thus, they pressed for the admission of the new states as slave states so their political power base would remain strong.</p>	13
The Issue of Slavery	<p>Explain that conversely, Northern politicians wanted to limit the spread of slavery into new territories and states both to restrain Southern political power and to support the moral issue. This led to the passage of the Missouri Compromise of 1820, which stipulated that, as new states entered the Union, a balance between slave and free states had to be maintained. This state of affairs lasted until the passage of the Kansas-Nebraska Act of 1854. This Act eliminated the Missouri Compromise and made it possible for slavery to be introduced into any new territory based on the decision of the residing population.</p>	14-15
The Issue of Slavery	<p>Explain that the Kansas-Nebraska Act was of great concern in the North. It represented the danger of the potential spread of slavery. Moderate politicians such as Abraham Lincoln and abolitionists throughout the North began actively working to oppose the act and any further spread of slavery. In the South, politicians convinced their constituents that the North was threatening their culture and way of life. This threat</p>	16-17

Chapter 4 / Section 1: NS2-M1C4S1 – Introduction to the Civil War

	was greatly intensified in 1859 when the militant Northern abolitionist John Brown raided the Federal arsenal at Harper's Ferry, Virginia (now West Virginia), and called for a general insurrection of Southern slaves.	
The Events of 1860-61	Explain that extremists on both sides became willing to go to war to ensure that their views prevailed. This situation was exacerbated by a nationalist premise on the part of many in the South that if the Federal government failed to protect their interests, Southern states had the right to secede from (leave) the Union. The Unionist response was based on the Preamble to the Constitution which stated that the Union derived its power from the people as a whole, no state could elect to secede without due process of Congress.	18
The Events of 1860-61	Explain that the Democrats had two candidates in the election, one candidate from the North and the other from the South. The remnants of the Whig party nominated a third candidate. As a result, Lincoln won the election with just 40 percent of the popular vote, even though he got only a smattering of votes from the South and no Southern electoral votes.	19
The Events of 1860-61	Explain that on 20 December, South Carolina carried out its threat to secede from the Union. Based on the idea that the election results did not represent the will of the Southern people, South Carolina elected to secede from the Union.	20
Video on the Events of 1860-61	Show video on the events of 1860-61	21
Check on Learning Questions A(Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	22
The Events of 1860-61	Explain that in early January 1861, the Union steamer <i>Star of the West</i> attempted to enter the harbor of Charleston, South Carolina, to resupply Union troops at Fort Sumter. The ship was fired on, and she retreated out of range.	23
The Events of 1860-61	Explain that six other Southern states soon followed South Carolina's lead. In February, the Confederate States of America was formed, with Jefferson Davis as its first president. The Confederacy at this point, consisted of South Carolina, Mississippi, Florida, Alabama, Georgia, Louisiana, and Texas.	24
The Events of 1860-61	Explain that a great shuffling of personal loyalties now began within the officer corps of the U.S. Army and Navy. They had to choose between the flag they were sworn to protect and their home ties to the Southern states. For many, the home ties proved to be strongest. They resigned their commission and headed south to serve the Confederacy. Among these were Robert E. Lee, who had been recognized as the Army's most promising officer, and Matthew Fontaine Maury, the Navy's first oceanographer. Union feeling was much stronger in the Navy enlisted rates, however. Most of the experienced career petty officers, boatswain's mates, gunners, quartermasters, and leading seamen stayed with the Union.	25-26
The Events of 1860-61	Explain that southern militias quickly took over many federal forts and bases throughout the South, leaving only four remaining in Union hands: Fort Pickens at Pensacola, Fort Taylor at Key West, Fort Jefferson on the Tortugas, and the forts in Charleston Harbor. Due to their remote positions and strength, the first three were beyond immediate danger.	27

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The Events of 1860-61	Explain that the Civil War was to start, however, at Fort Sumter in Charleston. The South Carolinians set up batteries facing the Fort and on 1 April, notified Confederate President Davis that all was in readiness. On the eleventh, General Pierre Gustave Beauregard demanded that Fort Sumter surrender. Major Robert Anderson, USA Garrison Commander, refused. At dawn on 12 April, Beauregard fired the first shot of the American Civil War. Fort Sumter returned the fire.	28-29
The Events of 1860-61	Explain that on 15 April, President Lincoln called for 75,000 volunteers for three months to suppress the rebellion. News of this, plus the fall of Fort Sumter, brought Arkansas, Tennessee, North Carolina, and Virginia into the Confederacy, but the western counties of Virginia left the state and came back into the Union as West Virginia.	30
Resources and Preparations	Explain that the United States Army had only about 16,000 regulars in uniform when the Civil War began. It was composed mostly of volunteer state militiamen. Of the 31 million Americans, however, 22 million lived in the North, while only 9 million, including 3.5 million slaves, lived in the South. The North's greater population would prove decisive. Before the war ended, the North had over 2.5 million men in uniform, including some 200,000 African American soldiers. The Confederates put about 1 million men in uniform.	31-32
Video on Resources and Preparations	Show video on Resources and Preparations	33
Resources and Preparations	Explain that there were no major shipyards in the deep South, and few merchant seamen. Even though the Union Navy was not prepared for the war, it was able to build and grow. The Confederacy had no Navy at all when the war began. It tried to build naval ships and armored gunboats called ironclads for harbor defense. Although the Confederacy fought valiantly, it could never match Northern sea power.	34-35
Resources and Preparations	Explain that despite its agricultural economy, the South was not able to produce its own food supply. Much of the plantation land was used to grow cotton and tobacco, of value only if it could reach a market. Large areas of the South were dependent on the importation of foodstuffs from other areas, particularly Texas and Arkansas. When the Mississippi River fell under Union Navy control in 1863, food supplies from the West were cut off. This, along with the Union Naval blockade of Southern ports, had the Confederacy on the verge of starvation by the time the war ended.	36
Resources and Preparations	Explain that in the face of these odds, one could rightfully question why the South would ever want to fight a war. There were many answers to such a question, some of them based on emotions and wishful thinking. Unfortunately, they were persuasive enough to cause many Southerners to hope for a victory. In the first place, neither side expected a prolonged war. The South thought the North would quickly tire of casualties and war expenses. It also believed Northern politics to be so unstable that the Union would never be able to fight as one unit. The border states—Maryland, Delaware, Kentucky, and Missouri remained in the Union and were at least partially sympathetic to the Confederate cause. For example, they supported both sides with troops.	37-38
Resources and Preparations	Explain that the Southern leadership had no idea of the economic demands of modern war, so it was not able to foresee its battlefield needs. One very important belief in the South was that the Northern blockade would cut off “King Cotton” from British and French markets, forcing those countries to help the Southern cause for economic reasons. This proved to be a vain hope, though there was much sympathy in Europe for the South. When exports of cotton from the South dwindled, Europeans turned to alternative sources of supply in Egypt and India.	39

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Resources and Preparations	Explain that in spite of these handicaps, the South had some undeniable strengths. Key among these was the high quality of its Officer Corps. They were some the finest who had recently worn the blue uniform. Also, the South was a vast territory, not easily invaded or held by anything other than a large and expensive army. Finally, the majority of Southerners were very loyal to the Confederate cause, a fact that gave the Southern leaders much comfort and enabled them to fight on against great odds. For a comparison of the assets of the North and South, and the advantage the North had over the South at the start of the Civil War, see the table in the textbook.	40-42
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	43
Navy Role: Blockade	<p>Explain that when the war began, Jefferson Davis knew that the South must get help from abroad. In order to force the economic issues, he authorized privateering on 17 April, granting letters of marque to ships of any nation that would prey on Northern shipping. He also declared an embargo on cotton, keeping it in the South in the hope that prices would rise for later sale to blockade runners.</p> <p>Explain that Lincoln's immediate response was to begin a naval blockade of all Southern ports from the Virginia Capes to Texas. Davis figured that Lincoln's action would so anger the British and French merchants and textile businesses that foreign privateers would be attracted to the Southern cause, tempted by the great profits that could be made. Second, he believed that this would eventually force the British and French to at least recognize and assist the South, if not openly join it, as allies.</p>	44
Navy Role: Blockade	<p>Explain that Davis was wrong on both counts. Both British and French shipyards built fast schooners and cruisers for the South to use as blockade runners, but they observed the Union blockade themselves. Trade with the North was far more important to them than trade with the South. In addition to new sources of cotton in Egypt and India, the Europeans already had huge inventories of raw cotton from the 1860 crop. Davis undoubtedly would have helped the Confederate cause much more if he had tried to ship out all the cotton he could before the Union blockade could become effective. This might have built up some cash reserves for purchasing war materials that could have been smuggled in by blockade runners.</p> <p>Explain that Gideon Welles, Lincoln's Secretary of the Navy, began a shipbuilding program and bought and adapted many vessels of the American Merchant Marine. By December 1861, Welles had 264 vessels in commission and had established an adequate blockade off all the major cotton ports including Wilmington, North Carolina; Charleston; Savannah; Pensacola; Mobile; Galveston; and the entrances to the Mississippi River.</p>	45
Navy Role: Blockade	Explain that every kind of ship, tugboat, and even paddle-wheel ferryboat was commissioned, equipped with one or two guns, and staked out along the Southern coast. They quickly stopped Confederate coastal shipping and made privateering and blockade running a hazardous business. Crews were recruited from every walk of life and often put to sea without any training. However, in most ships, career men or merchant mariners served as a nucleus of trained men and they quickly whipped the new men into shape. Men learned fast when they were under shore-battery fire, and they were kept busy trying to stop enemy blockade runners throughout most of the war.	46

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Navy Role: Blockade	<p>Explain that the expansion of the blockade presented one problem. The farther from Union territory the ships were, the more dependent on coal and other supplies they became. Consequently, a plan was developed to establish a series of bases at strong points along the Confederate coast. These would be captured by amphibious assault, garrisoned strongly, and then used to support the blockade. By the end of 1862, amphibious actions had secured Port Royal, South Carolina; Hatteras Inlet, North Carolina; and Jacksonville, St. Augustine, and Pensacola, Florida. Once these bases were established and the blockade was tightened around Florida. Florida was practically put out of the war because its inland transportation was so poor.</p>	47
Navy Role: Blockade	<p>Explain that The loss of Florida deprived the South of its salt mills, which were essential for the preservation of ham and bacon for Southern troops. The Confederates were never able to get rid of these naval bases deep in their territory. These coastal actions, though not as well-known as several of the major land battles, were ultimately significant factors in the Union victory.</p> <p>Explain that one of the key lessons learned by the Navy in its successful amphibious actions was that even the finest forts ashore were vulnerable to accurate naval gunfire. The man largely responsible for the improvement of naval ordnance at this time was Commander John Dahlgren. He developed larger smoothbore guns that fired round shot with heavy charges. These shells were excellent for destroying gun emplacements and fortified sites along the shore.</p>	48
Defeats and Diplomacy	<p>Explain that the First Battle of Bull Run in July, 1861 had ended in a Northern defeat just a few miles from Washington, D.C. The battle put an end to any ideas of a quick victory over the Confederacy. Lincoln extended enlistments from the original three months to three years. The battered Northern Army of the Potomac dug in around the capital, expecting a Confederate attack that never came.</p>	49
Defeats and Diplomacy	<p>Explain that by October, the South was anxiously hoping that British and French ships would run the blockade in order to pick up the cotton crop that had just been harvested. In order for this to happen, the South needed the Confederacy to be recognized as an independent nation. To try to accomplish this, Davis sent two ambassadors to Europe on the <i>Trent</i>, a British steamship sailing from the West Indies. James Mason was en route to England, John Slidell to France. They were intercepted on 8 November by Captain Charles Wilkes and his Union sloop <i>San Jacinto</i>. Wilkes overhauled the British ship, stopped her on the high seas with shots across the bow, and removed Mason and Slidell by force. This action was in direct violation of international law.</p> <p>Explain that as a result of this affair there were immediate cries in England for war and the English fleet was mobilized. However, the matter was settled through diplomatic means by having the prisoners released to British custody. France, which was planning to take advantage of the Civil War by sending an expeditionary force to Mexico, also came near to recognizing the Confederacy. Naval events, however, caused both nations to hold off.</p>	50-51
River Campaigns	<p>Explain that Bull Run had temporarily stopped military activity in the east, but not in the upper Tennessee and Mississippi River Valleys. Events were about to take place that would foretell the defeat of the Confederacy.</p>	52
Video 1 of River Campaigns	<p>Show video 1 of river campaigns</p>	53
River Campaigns	<p>Explain that in February 1862, a joint force of Navy gunboats and Union Army volunteers under the command of a little-known brigadier general, Ulysses S. Grant, captured Fort Henry in north-central Tennessee. The river Navy was a development of</p>	54-55

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	the times, adjusting to the circumstances of the war. The Union river gunboats became the first ironclads in the United States. Grant conceived of them as mobile artillery. Under Commodore Andrew Foote, the Navy's river squadron demolished Fort Henry and had already accepted its surrender when Grant's army arrived. Grant then turned his army towards Fort Donelson, 12 miles away on the Cumberland River, capturing it after a short siege. The loss of these two forts closed the Tennessee and Cumberland Rivers to the use of the Confederacy and severely hampered the movement of troops and supplies from the central portion of the south.	
River Campaigns	Explain that Grant next moved up the Tennessee River to Pittsburg Landing and was attacked at Shiloh in April. But for the covering gunfire from two gunboats, Grant's left flank would have been destroyed and the battle lost. The gunboats fired into the Confederate positions throughout the night, one shell per minute. When Grant attacked the next morning, it was this section of the Confederate line that broke and give Grant his costly victory.	56
River Campaigns	Explain that since all river transport to the place had been stopped, the Confederates now had to abandon their large fortress at Columbus, Kentucky. While Grant rested from Shiloh, the Union General, John Pope kept up the pressure and moved on down the Mississippi River to Island No. 10, where the river formed an S-curve at the Kentucky-Tennessee line. There was a major Confederate fortress guarding the route south on the river.	57
Video 2 of River Campaigns	Show video 2 on River Campaigns	58
River Campaigns	Explain that on 4 April, the Union gunboat <i>Carondelet</i> succeeded in running the Confederate batteries and placed herself in position to destroy the enemy guns on the Tennessee side. Pope's men could now cross behind her. Island No. 10 surrendered on 7 April with 7,000 prisoners. Western Kentucky and much of western Tennessee were now under federal control. The Union forces consolidated and made preparations to move on Memphis.	59
Review Question	The Review Question is "List 2-3 reasons why the Civil War may have been inevitable." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	60
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	61
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	62

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III. Supplemental Activities -

A. In Class Activity:

Supplies required: White board or MOBI

When: This is a good activity to do at the beginning of the lesson.

- Have a discussion with the class and list their answers to the following questions on the white board. What do you think were the reasons for the start of the civil war? What was the civil war really about?

B. Take Home Activity: In today's lesson we discussed how a nation can be divided by a single issue. Find a current event that you think has significantly divided the nation today. Develop a presentation to give to the class on the topic giving the pros and cons of both sides of the issue.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 4 / Section 2: NS2-M1C4S2 – The Battle for Control of the Mississippi

(Section 2 of 3)

What Students Will Learn to Do:

Demonstrate knowledge of the Civil War, 1861 – 1865

Skills and Knowledge to be Gained:

1. Explain the significant events that took place during the Battle of New Orleans
2. Describe the CSS *Virginia* (formerly USS *Merrimack*) and the USS *Monitor*
3. Describe the major events that occurred during the Battle of Hampton Roads
4. Describe how General Robert E. Lee was able to prolong the life of the Confederacy after the Battle of Hampton Roads
5. Describe the Emancipation Proclamation as a significant psychological move for the North in the Civil War
6. Describe the major events that occurred during the Battle of Vicksburg
7. Describe the Battle of Gettysburg as the turning point in the Civil War

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	KeyTerm Definitions	Opening Question	Warm Up Questions	The Battle for New Orleans (A)	Video The Battle for New Orleans	The Battle for New Orleans (B)
The Monitor and the Merrimack (A)	Video1 The Monitor and the Merrimack	The Monitor and the Merrimack (B)	Video The Monitor and the Merrimack	Check On Learning A	The Battle of Hampton Roads	Lee Gains Time	Video Lee Gains Time
Check on Learning B	The Emancipation Proclamation	Video Vicksburg	Vicksburg	Video1 The Turning Point	Turning Point (A)	Video2 The Turning Point	Turning Point (B)
Review Questions	Closing Questions	Call for Other Questions					

Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

Chapter 4 / Section 2: NS2-M1C4S2 – The Battle for Control of the Mississippi

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 4. Place a checkmark beside the NS2-M1C4S2 PowerPoint presentation, and these two CPS question deck files: NS2-M1C4S2 - Key Terms and NS2-M1C4S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons. In this lesson, we will discuss the factors that led to the Civil War and the resources available to each side. We will cover key battles, naval conflicts, and new naval construction that changed the face of naval warfare forever. By the 1840s, the United States had crossed the North American continent, the Canadian boundaries had been established, and foreign threats to the United States had been virtually eliminated. America concerned itself with overseas trading. For years slavery had been declared illegal; and periodically, attempts were made to help the British to stop the slave trade. Still, slavery haunted American life and commerce. Slavery had become a major political issue as new states joined the Union from western territories. There were repeated debates and compromises on the issue of slavery in Congress. The issue of slavery was both commercial and moral. Slavery had become the mainstay of the South's agricultural economy, while the North had developed a mechanized, industrial economy. These conflicting interests between the free northern states and the southern states could not be reconciled. War was the result.	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-8
Opening Question(Random Pick a Student – "RPS")	This Opening Question is "List 2-3 reasons why ships that could submerge under water were desirable in warfare." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on the battle for New Orleans.	9
Warm-Up Questions(Lesson questions 1-2)	Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions. Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.	10

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The Battle for New Orleans	Explain that New Orleans was the South's largest and most important port city. While Grant was making a military name for himself by winning the strategically important central Mississippi Valley, another of the great Union heroes of the war began his move on this key city. Flag Officer David Glasgow Farragut assembled his fleet in mid-April: one frigate, four sloops, a paddle-wheeler, twelve gunboats, and twenty schooners. Farragut had been in the Navy for fifty years, having served continuously since the War of 1812. This was to be his biggest battle yet.	11-12
Video of the Battle for New Orleans	Show video of the battle for New Orleans	13
The Battle for New Orleans	Explain that he navigated the fleet through the delta to a Confederate log barrier several miles upriver. Here there were two forts, Fort Jackson on the left bank and Fort St. Philip on the right. On the sixteenth of April, he started a steady fire on the forts, which was to last for five days. Then he sent a raiding party to destroy the barrier. They were successful in making a small gap so ships could get through in single file. On the twenty-fourth, just after midnight, the fleet started the dangerous trip.	14
The Battle for New Orleans	Explain that Farragut organized the assault force in three divisions, plus one division of mortar boats under the command of Commander David Porter, which was to remain at the barrier and protect the rear. At 0340 the assaulting divisions arrived at the barrier and started to take heavy fire from the forts. The Union warships received numerous hits but plowed through the hail of fire into the midst of the Confederate defensive fleet. Once through the barrier, the superior Union fleet blasted the defenders out of the water, sinking a dozen vessels. Farragut proceeded up the river to New Orleans and anchored his fleet off the quays of the port. The next day, the city surrendered, and the bypassed forts quickly gave up.	15
The Battle for New Orleans	Explain that the South's leading port was now in the hands of the Union. It was a disaster for the Confederacy. The British and French, who had been thinking about recognizing the South, now thought differently. After all, if a major port could not be held, there did not seem to be much chance that the Confederacy could survive. Thereafter, they no longer seriously considered recognizing the South, though shipyards in both nations continued to build blockade runners and cruisers for the Confederacy.	16
The Battle for New Orleans	Explain that Union naval forces and supporting armies now converged from both the north and south on Vicksburg, Mississippi, the major remaining Confederate fortress on the river. A major naval battle—the only real fleet action of the war—was fought in the Mississippi at Memphis, Tennessee. The entire Confederate River Navy was destroyed, except for the unfinished ironclad ram <i>Arkansas</i> , which had been towed south into the Yazoo River. By late 1862 Grant had arrived to surround Vicksburg, and Farragut had brought his blue-ocean fleet to support the siege of Vicksburg. The high bluffs prevented serious naval bombardment of the city, so the Navy patrolled, transported Union troops, protected the Army's flanks, and prevented Confederate relief of the city. The city's defenses were strong, however, and Vicksburg did not surrender until 1863.	17-19
The Monitor and the Merrimack	Explain that as the Union was sealing off the Confederacy with the blockade, the Confederates made plans to break out. They had captured the USS <i>Merrimack</i> , a new steam frigate burned and scuttled by Union forces when they withdrew from the Norfolk Navy Yard. Explain that the Confederates raised the vessel, placed her in dry dock, and set about converting her into the first Confederate ironclad.	20

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Video 1 on the Monitor and the Merrimack	Show video 1 on the <i>Monitor</i> and the <i>Merrimack</i>	21
The Monitor and the Merrimack	Explain that Stephen Mallory, the Confederate Secretary of the Navy, directed the plan. Mallory believed the vessel to be the best means of driving the Union blockaders from the mouth of the Chesapeake and reopening Norfolk as a cotton port.	22
The Monitor and the Merrimack	Explain that the ship could make only 4 knots and drew too much water for safe navigation in the rivers, but she was something entirely new and a real danger to any wooden vessel. Her main deck was overlaid with a casemate framed with twenty-inch pine beams, four-inch oak planks, and two layers of iron plates. The sloping sides of the casemate were to be smeared with tallow so solid shot would bounce off harmlessly. Re-commissioned as the CSS <i>Virginia</i> , she mounted three 9-inch Dahlgren guns, two 6-inch rifles in broadside, and two 7-inch rifled pivot guns. A heavy iron ram was fitted on her bow.	23
The Monitor and the Merrimack	Explain that when the work was nearly completed, Commander Franklin Buchanan, a former U.S. naval officer who had been the first Superintendent of the U.S. Naval Academy, was named Commanding Officer of the <i>Virginia</i> . He mustered a crew of about 350 men. If the ship could get under way in time, the five wooden Union Navy ships blockading Norfolk and the lower Chesapeake could be smashed to matchwood, and the Union troops in Newport News and Fortress Monroe in Hampton Roads would have to evacuate.	24
The Monitor and the Merrimack	Explain that work continued from May 1861 to the end of February 1862, the project slowed by the lack of iron plate and other metal parts. In early March, the <i>Virginia</i> was finally ready to fight.	25
The Monitor and the Merrimack	Explain that in August 1861 spies brought word to Lincoln that the Confederates had raised the <i>Merrimack</i> and were working to build an ironclad ram. Navy Secretary Welles appointed an Ironclad Board, and Congress was persuaded to appropriate \$1.5 million for construction of ironclad steamships. The Navy itself was slow to accept the idea, however, because most of its older officers held the highest positions. Nevertheless, Welles pushed the project through. John Ericsson, a Swedish-born builder in Brooklyn, New York, was awarded the contract to build the vessel after President Lincoln commented favorably on his sketches.	26
The Monitor and the Merrimack	Explain that Ericsson worked feverishly on his design, incorporating in it as many as forty new patents. The craft had only a foot or so of freeboard, so as to present a very small target. Her battery was two Dahlgren 11-inch guns in a heavily armored turret. The deck was armor plated also, and an overhang protected the screw and rudder. Through steam power, the fourteen-ton turret could be rotated 360 degrees. The Monitor was commissioned on 25 February 1862, with Lieutenant John L. Worden, USN, as commanding officer. After a brief testing, the ship was ordered to Hampton Roads, near the entrance to Norfolk Harbor.	27-28
Video 2 on the Monitor and the Merrimack	Show video 2 on the Monitor and the Merrimack	29
Check on Learning Questions A(Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	30
The Battle of Hampton Roads	Explain that in early March, the North and South appeared to be in an unstable balance in the east, though things had begun to go badly for the Confederacy in the	31

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	west. President Lincoln finally persuaded General George McClellan to plan a move on Richmond from the south, landing his forces at Fortress Monroe and moving up the peninsula to the Confederate capital. Only the threat of the CSS <i>Virginia</i> hung over the optimistic expectations of the Union commander. If the <i>Virginia</i> got loose in Hampton Roads, it would not only doom the wooden blockade vessels but also destroy his whole plan to move on Richmond.	
The Battle of Hampton Roads	Explain that on 8 March the <i>Virginia</i> steamed out from the Norfolk Navy Yard and headed down the Elizabeth River toward the anchored Union blockade ships, the USS <i>Cumberland</i> and the USS <i>Congress</i> . As the <i>Virginia</i> moved toward the two ships, the <i>Cumberland</i> began firing, but the shots merely bounced off the sloping iron sides. Buchanan fired a few shots, but his intent was to ram. The <i>Virginia</i> plowed into the side of the <i>Cumberland</i> , then backed off. The Union sloop sank quickly, taking with her more than a third of the crew. The ship's crew fought gallantly right to the end. The <i>Virginia</i> suffered only two casualties but lost her ram when backing off the sinking ship.	32
The Battle of Hampton Roads	Explain that in this operation, however, some Confederate sailors were killed by Union troops on shore. In retaliation Buchanan ordered the <i>Congress</i> bombarded with red-hot shot. While topside to observe this, Buchanan was hit in the leg by a Union Minié ball and had to be relieved in command by Lieutenant Catesby Jones.	33
The Battle of Hampton Roads	Explain that Jones now turned his attention to the USS <i>Minnesota</i> , another blockader run aground. But this ship was too far into the shoal waters to be accurately fired upon. The <i>Minnesota</i> was hit several times by the <i>Virginia</i> and some small Confederate ships from the James River squadron that had joined the fight since they were no longer blockaded. After three hours of trying to get closer, the <i>Virginia</i> broke off and retired to an anchorage under Sewell's Point in Norfolk. She had suffered only minor damage, and she was ready for action again the next day.	34
The Battle of Hampton Roads	Explain that during the evening of the 8th, the Monitor entered Hampton Roads illuminated by the flames of the burning Congress, and anchored near the Minnesota to protect her Explain that early in the morning of 9 March, Union sailors saw the exhaust of the <i>Virginia</i> as she came out of her anchorage. The Confederate ship took a different channel so she could get much closer to the <i>Minnesota</i> . Worden pulled up anchor and placed the <i>Monitor</i> between the <i>Virginia</i> and the helpless wooden vessel. Then began a ferocious four-hour gunnery duel at close range between the two ironclads. The <i>Monitor</i> kept so close that the <i>Virginia</i> had trouble bringing a gun to bear. The Union ship, much smaller and drawing only twelve feet of water, was much more maneuverable, but even with her larger guns, she could not penetrate the Confederate's armor. Finally, Jones broke off with the <i>Monitor</i> and concentrated on the <i>Minnesota</i> , quickly setting the ship on fire.	35-36
The Battle of Hampton Roads	Explain that now, however, the <i>Virginia</i> went aground. The <i>Monitor</i> closed in, believing she could finish the Confederate off. Jones, however, shifted his fire from the <i>Monitor</i> 's turret to the small pilothouse forward. A lucky shot exploded ahead of the viewing slits, temporarily blinding Worden and seriously wounding him in the face. Lieutenant Samuel Greene, the executive officer, was in the turret. It took him twenty minutes to get the word and proceed to where he could conn the ship. In the meantime, the helmsman kept steering Worden's last order, which was to "sheer off." As a result, the <i>Monitor</i> withdrew toward Fortress Monroe, during which time the <i>Virginia</i> freed herself from the bottom.	37
The Battle of Hampton Roads	Explain that the battle thus came to an indecisive end. But clearly, the age of ironclad vessels had arrived. With it, a whole new set of naval tactics had to be developed by the world's navies. The timely arrival of the <i>Monitor</i> , and numerous other Union	38-40

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	vessels, including other ironclads, enabled General McClellan to launch his peninsular campaign against Richmond. Norfolk was captured, and the <i>Virginia</i> was blown up by her own crew to prevent capture. The <i>Monitor</i> sank a year later in a gale off the Carolina Capes, taking down a part of her crew. She would be an important influence in naval ship design for more than forty years. (The wreck of the Monitor was located in 1973, and various parts, including her turret, anchor, propeller, and engine, have been recovered.)	
Lee Gains Time	Explain that the commander of the Confederate Army of Virginia was General Robert E. Lee.	41
Lee Gains Time	Explain that in a series of sharp engagements called the Seven Days' Battles, Lee pushed McClellan back from Richmond. By August, McClellan had to evacuate the peninsula and reorganize the defenses of Washington. In September, Lee crossed the Potomac into Maryland in the first invasion of the North. He hoped to detach Maryland from the Union and move into Pennsylvania. He wanted to impress the North with the horrors of war and gain diplomatic recognition and military aid from the European powers by this grand undertaking.	42
Lee Gains Time	Explain that on 17 September at Antietam Creek near Sharpsburg, Maryland, however, Lee met McClellan's reorganized and reequipped Army in the bloodiest one-day action of the entire war. Over 12,000 thousand Union and 13,000 Confederates fell in battle that day. Lee was forced to withdraw to Virginia. The immediate threat to Maryland, Washington, and the North was stopped, but Lee had gained some time and prolonged the life of the Confederacy.	43
Video of Lee Gains Time	Show video of Lee gains time	44
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	45
The Emancipation Proclamation	Explain that Antietam was an expensive victory for the North, but it served to hearten the Union. Lincoln took the opportunity to announce his preliminary Emancipation Proclamation on 22 September 1862. He promised freedom to all slaves within the territories still in rebellion on 1 January 1863. He was in no position to enforce such an edict, but it was a great psychological move. Although it did nothing to free slaves in the border states, or in Confederate areas controlled by the Union, the proclamation rallied many Northerners who were only lukewarm about continuing the war. It also made a significant difference in European attitudes. The war now became a cause for the liberation of the slaves, which Europe favored, not just a war to save the Union, toward which most Europeans were indifferent. It thus ended any chance that France or Britain would intervene in favor of the South in the war.	46
The Emancipation Proclamation	Explain that many liberated slaves joined the Union forces. Lincoln's proclamation could not enforce freedom for slaves in the Confederacy, of course. But the Emancipation Proclamation encouraged the passage by Congress of the Thirteenth Amendment to the Constitution in 1865, which finally ended slavery in the United States.	47-49
Video on Vicksburg	Show video on Vicksburg	50

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Vicksburg	Explain that Farragut had arrived off the Mississippi River fortress of Vicksburg in May 1862, after running north from New Orleans. He quickly discovered, however, that this “Gibraltar of the Mississippi” could not be taken by the Navy alone. He called for at least 12,000 troops to storm the city from the landward side before the Confederates could fully prepare for such an assault. An army never came, however, and the Confederate buildup continued. Finally, Farragut had to return to New Orleans because the depth of the water began to fall as summer progressed. A large stretch of the southern Mississippi returned to Confederate control by the end of the year because of this lack of coordination between the Army and Navy.	51
Vicksburg	Explain that after three failed attempts by the Union to take Vicksburg, Grant settled in for a siege of the city	52
Vicksburg	Explain that in October Rear Admiral David Dixon Porter was given command of the naval forces on the upper Mississippi. He called for many more ships and guns. Porter worked out a scheme with Grant and General William Tecumseh Sherman to put a pincers movement against Vicksburg. He figured the Confederates could not defend the city equally well from two directions. But the scheme failed when Grant’s supply line and stores were destroyed by Confederate cavalry. Without Grant’s forces, the Confederates were able to concentrate on Sherman, and the campaign failed.	53
Vicksburg	Explain that for forty days and nights, Porter’s mortar boats rained destruction on Vicksburg, while the Army tightened its noose. Vicksburg’s defenders took shelter in caves and lived on horse meat and rats. Finally, weakened by starvation, the 31,000 Confederates surrendered on 4 July 1863. Four days later the fort at Port Hudson surrendered, and the Mississippi River was clear of all Confederate forces from Illinois to the Gulf of Mexico. The Confederacy was split. Grant paroled the Vicksburg prisoners and sent them home under a pledge to take no further part in the war.	54-55
Video 1 The Turning Point	Show video 1 on the turning point.	56
Turning Point	Explain that despite the Union victories in the Mississippi Valley, General Lee and his Army of Northern Virginia were still very much in the war. In May 1863 Lee took on the Army of the Potomac at Chancellorsville, Virginia, and won a resounding victory over Northern General Joseph Hooker. Lee lost his most talented general officer at Chancellorsville, however. “Stonewall” Jackson was accidentally killed by his own men in the darkness as he returned from a reconnaissance mission.	57
Turning Point	Explain that the victory spurred Lee on to plan another invasion of the North. It was a desperate gamble to crush the Union’s will to carry on the war. Taking an army of 75,000 men, he marched up Virginia’s Shenandoah Valley and emerged near the town of Gettysburg, Pennsylvania, on 1 July. At Gettysburg he ran into a Union Army of 90,000 men under the command of General George Meade. There followed one of the bloodiest and most decisive battles of the war.	58
Turning Point	Explain that after initial Confederate successes on 1 July, the two Generals spent the next day probing for weaknesses in each other’s lines. Lee took control of the town, while Meade took control of strong defensive positions in the hills south of it. Desperate fighting took place as Lee tried to outflank the Union line on Cemetery Ridge and Culp’s Hill. The Confederates were thrown back after fierce hand-to-hand fighting.	59
Turning Point	Explain that on 3 July Lee ordered an all-out frontal assault against Cemetery Ridge after an intensive two-hour artillery barrage. At about 1400, a force of 15,000 men in gray, most under the command of Major General George Pickett, moved in front of	60-61

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	the ridge and began a charge across an open field into the very teeth of the Union lines. Artillery and small-arms fire cut down thousands. Some managed to reach the Union lines but were killed or thrown back. Pickett's failed charge decided the battle. Lee was forced to begin his retreat back to Virginia that night, leaving 20,000 casualties from the three-day battle on the field.	
Video 2 on the Turning Point	Show video 2 on the turning point.	62
Turning Point	Explain that the North had now achieved two great victories on successive days—Vicksburg and Gettysburg. The tide of the war had changed; there was no longer any hope of the South winning. Lee's task now was to try to keep his army intact by avoiding major battles, and to try to arrange a settlement that would keep the Confederacy alive.	63
Review Question	The Review Question is "List 2-3 issues in our society today that might be similarly controversial as slavery was in the 1860's." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	64
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	65
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	66

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Whiteboard or MOBI and map of New Orleans area; handout for take home activity.

When: This is a good activity to do before lesson.

- With the class divide them into two groups.
Class question: Why was the city of New Orleans so important to hold?
- Using the Map provided, have one group come up with a plan to protect the city and the other group a plan to take it. The groups should use resources that would be available during the Civil War and in amounts that represent the relative resources of the period. Have each group present their ideas to the class. Now give the lesson and discuss what actually was done and the outcome.

A. In Class Activity – (Alternate):

Give the Gettysburg Address omitting the first sentence (Below in Red):

Bliss Copy

Four score and seven years ago our fathers brought forth on this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal.

Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here

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gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

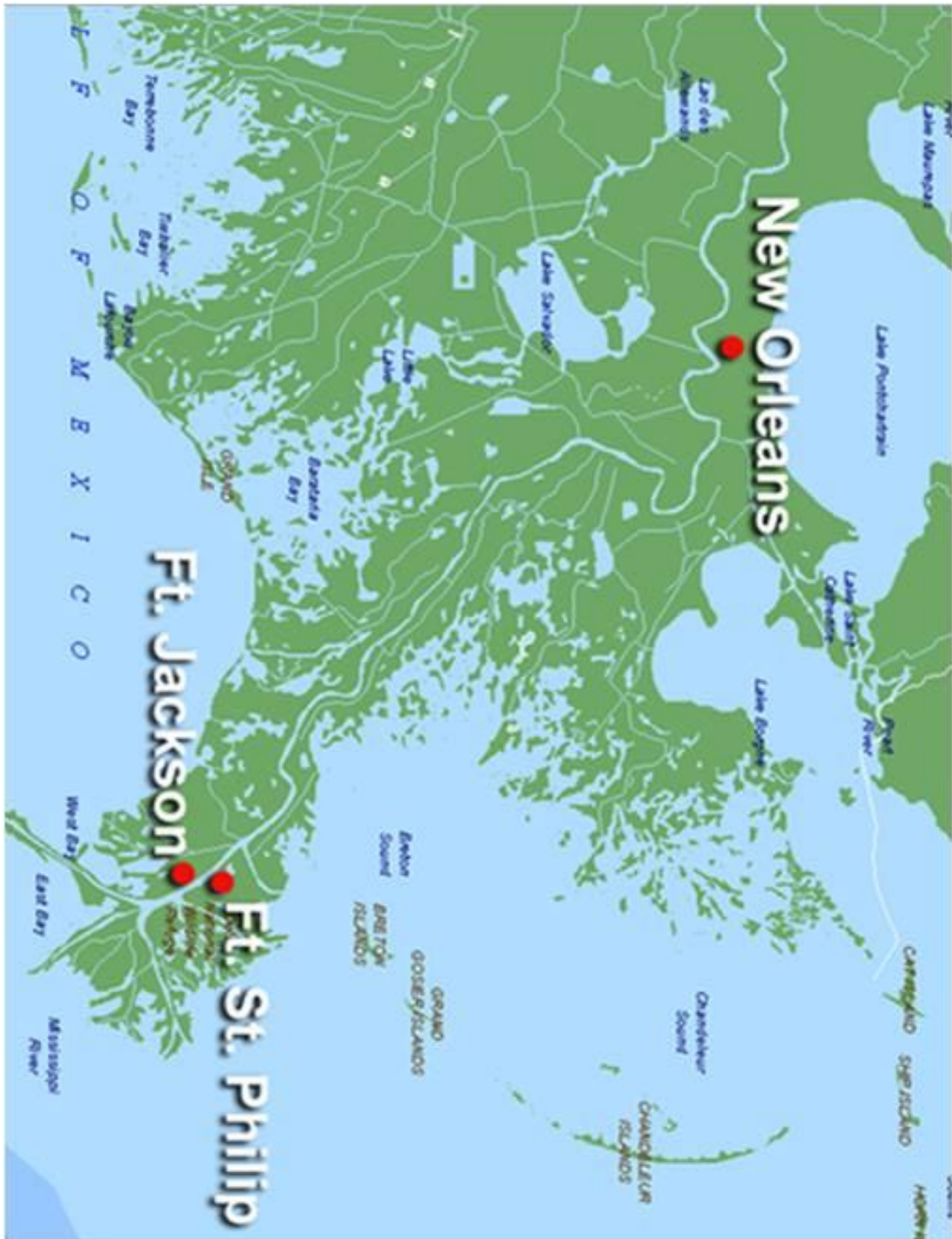
But, in a larger sense, we cannot dedicate -- we cannot consecrate -- we cannot hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us -- that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion -- that we here highly resolve that these dead shall not have died in vain -- that this nation, under God, shall have a new birth of freedom -- and that government of the people, by the people, for the people, shall not perish from the earth.

- Class question: Who said this? If no one knows or they answer partially (i.e. President Lincoln and not that it was also the Gettysburg address) give the first line of the speech and see if anyone now knows. Why was it given? How long is 4 score and 7 years? (87 years) What was the significance of the battle of Gettysburg?

B. Take Home Activity: Using the Handout “The Emancipation Proclamation” write a summary of what the emancipation proclamation did do and what it did not. What was the impact of the emancipation proclamation on the Civil War? Did it have any effect on states that had not joined the Confederation?

IV. Evaluation - see CPS database for chapter test questions.

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Take Home Activity- The Emancipation Proclamation

Name: _____ Date: _____ Class: _____

Directions: Write a summary of what the emancipation proclamation did do and what it did not. What was the impact of the emancipation proclamation on the Civil War? Did it have any effect on states that had not joined the Confederation?

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(Section 3 of 3)

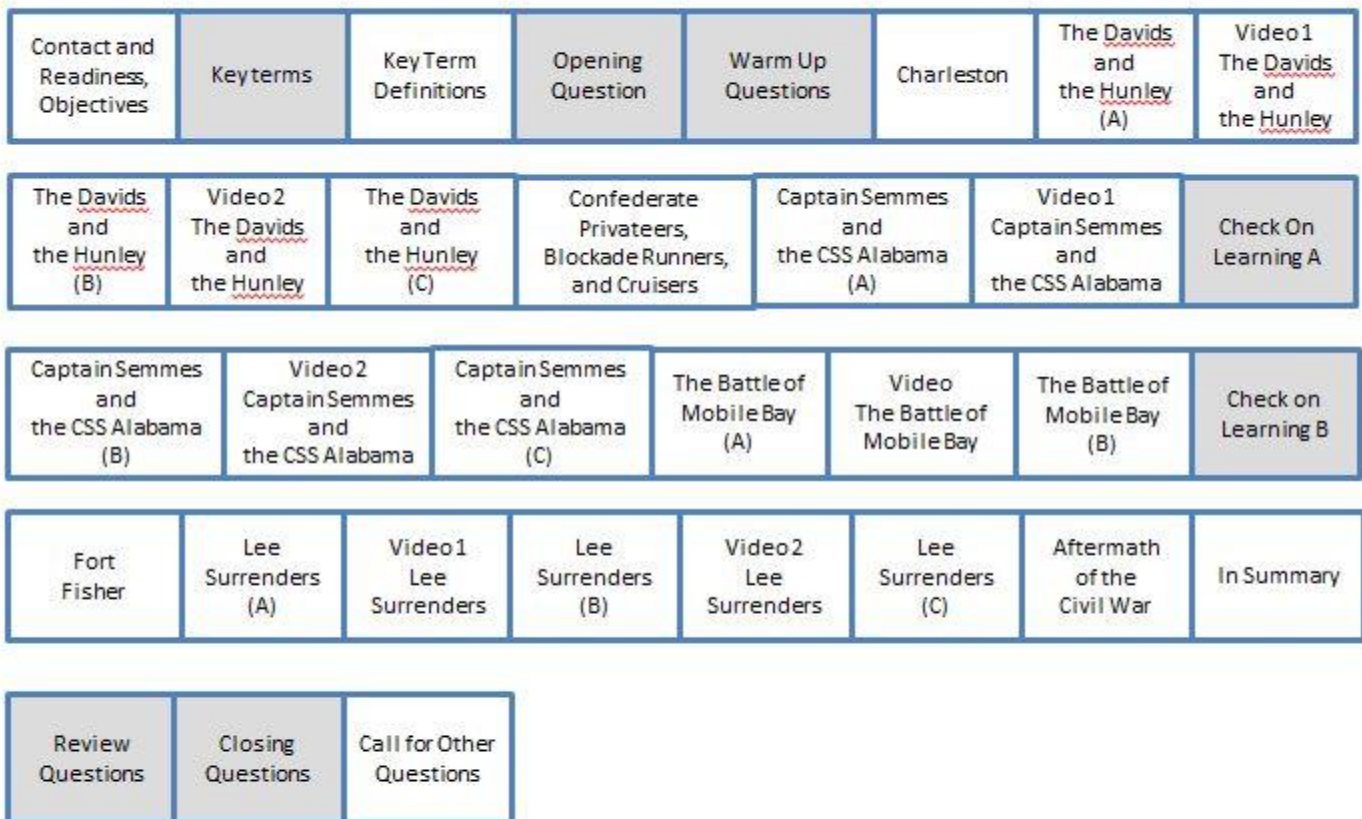
What Students Will Learn to Do:

Demonstrate knowledge of the Civil War, 1861 – 1865

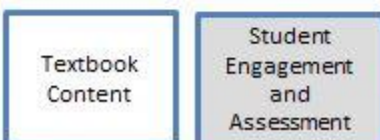
Skills and Knowledge to be Gained:

1. Explain the role that Charleston played in the Civil War.
2. Explain the purpose of the David and the Hunley.
3. Explain the purpose of the Confederate privateers during the Civil War.
4. Explain the role that Captain Semmes and the CSS *Alabama* played in the Civil War.
5. Describe three major events that occurred during the Battle of Mobile Bay.
6. Describe the naval amphibious assaults on Fort Fisher in Wilmington NC during the Civil War.
7. Explain the primary reason General Robert E. Lee was forced to surrender.
8. Explain the changes to American life that occurred during or as a result of the Civil War.

LESSON FLOW OUTLINE



Key:



Chapter 4 / Section 3: NS2-M1C4S3 – Charleston

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 4. Place a checkmark beside the NS2-M1C4S3 PowerPoint presentation, and these two CPS question deck files:
NS2-M1C4S3 - Key Terms and NS2-M1C4S3 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will discuss the factors that led to the Civil War and the resources available to each side. We will cover key battles, naval conflicts, and new naval construction that changed the face of naval warfare forever. By the 1840s, the United States had crossed the North American continent, the Canadian boundaries had been established, and foreign threats to the United States had been virtually eliminated. American concerned itself with overseas trading. For years slavery had been declared illegal and periodically, attempts were made to help the British to stop the slave trade. Still, slavery haunted American life and commerce. Slavery had become a major political issue as new states joined the Union from western territories. There were repeated debates and compromises on the issue of slavery in Congress. The issue of slavery was both commercial and moral. Slavery had become the mainstay of the South's agricultural economy, while the North had developed a mechanized, industrial economy. These conflicting interests between the free northern states and the southern states could not be reconciled. War was the result.</p>	1-5
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	6
Key terms - Definitions	Reinforce the correct definition for each key term.	6-9
Opening Question(Random Pick a Student – "RPS")	This Opening Question is "List 2-3 strengths of the navies of both sides of the Civil War." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on Charleston.	10

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Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	11
Charleston	<p>Explain that from the beginning of the war, Secretary Welles and the North looked upon Charleston as the hotbed of secession. Especially galling was Fort Sumter, where Union forces had been humbled in the first battle of the war. Charleston was not as important as New Orleans, Wilmington, or Mobile, but it was of high symbolic value to both sides. The Union Navy had blockaded Charleston since the start of the war. Charleston Harbor was defended by well-placed fortifications. It was impossible to approach the harbor entrance without coming under fire from these forts. Further, the main ship channel went directly past Fort Sumter. Confederate Generals Beauregard and Ripley were engineers who had laid out an extensive earthen and sandbagged defensive system that was far more efficient than masonry forts. They emplaced many heavy guns of the latest design with rifled barrels that fired shot of great penetrating power. Underwater they had placed obstacles such as heavy piles, a log and chain boom, rope barriers to foul propellers, and a field of torpedoes (mines).</p>	12-15
Charleston	<p>Explain that in addition to these defenses, inside the harbor the Confederates had built two ironclads, which periodically made destructive forays out into the Union’s wooden blockade fleet.</p>	16
Charleston	<p>Explain that picket fences helped protect the walls and also served to keep the enemy from scaling the walls. The high, thick walls of Fort Sumter were extremely difficult to climb or penetrate.</p>	17
Charleston	<p>With the experience of the <i>Monitor</i> and the <i>Virginia</i>, both sides had begun an ironclad building program. The North believed that its new ironclads could force their way into the harbor at Charleston. Union Admiral Samuel DuPont decided to launch a naval attack on 7, April 1863, with nine ironclads. The ships were slow in getting started and the lead ship became fouled in her own minesweeping apparatus. The column plodded up the channel, anchoring periodically to avoid running aground.</p> <p>Explain that on arrival at the first barrier, the entire column became a target for the most accurate and concentrated fire yet seen in the war. The Confederate Generals had pre-aimed their guns and could hardly miss their target. Hundreds of Southern shells hit the ironclads. The ironclad <i>Keokuk</i> was sunk after being struck more than ninety times. The other monitors escaped damaged, jarred and jammed, but with only one death.</p>	18
Charleston	<p>Explain that DuPont had served well on the blockade station for over two years, but he had attempted the impossible. The admiral reported to President Lincoln that Charleston was impregnable to naval attack alone, and that a major amphibious assault involving large army units was necessary. Both the president and the Navy Department reluctantly agreed. The political pressures were such that DuPont was relieved shortly thereafter. Admiral John Dahlgren arrived on the scene as DuPont’s relief. The Army sent General Gillmore of the Corps of Engineers.</p>	19

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Charleston	Explain that together, the two hoped to place Charleston under siege and force its surrender. Thereafter, a series of land and sea assaults took place. Several of the outer islands were taken by amphibious landings, but only after weeks of terrible casualties were the forts secured. The guns were then turned on Fort Sumter, which was reduced to rubble. The Confederates refused to surrender, however, and several naval and amphibious assaults on it failed during the next year.	20
The Davids and the Hunley	Explain that during the attacks on Charleston, the Confederates devised two new kinds of war vessels: the “ <i>David</i> ” and a submarine. <i>Davids</i> were old gunboats cut close to the water line, covered with iron plating, and armed with a charge of gunpowder attached to the end of a long spar protruding from the bow.	21
Video 1 of The Davids and the Hunley	Show video 1 of the <i>Davids</i> and the Hunley	22
The Davids and the Hunley	Explain that the vessel was supposed to ram a Union ship hard enough that the spar would stick like a spear, then back off while the explosive was detonated by yanking a long cord. A number of Union vessels were attacked in Charleston Harbor by the <i>Davids</i> . The powerful Union ironclad <i>New Ironsides</i> was badly damaged.	23
The Davids and the Hunley	Explain that since the <i>Davids</i> had some success, the Confederates began working on a more sinister vessel in Mobile, Alabama. This was the <i>Hunley</i> , the world’s first submarine warship. The <i>Hunley</i> was originally designed to pull a torpedo fastened at the end of a line into the side of an enemy ship after submerging and going underneath it. It was later fitted with a spar torpedo instead.	24
Video 2 of The Davids and the Hunley	Show video 2 of the <i>Davids</i> and the <i>Hunley</i> .	25
The Davids and the Hunley	Explain that the <i>Hunley</i> was built of a section of iron boiler about forty feet long, four feet wide, and four feet deep. The bow and stern each contained a ballast tank that could be flooded to make the vessel submerge and pumped out to make her rise. A set of leather bellows provided air circulation. A small conning tower on top had four tiny glass observation ports through which the captain had visual capabilities. The vessel was powered by eight or nine men turning a crankshaft attached to a propeller at the stern. During the first sea trials in Mobile, the <i>Hunley’s</i> crew drowned. The vessel was shipped by rail to Charleston, where three more crews drowned in trials. General Beauregard prohibited her from being submerged again, and tactics were changed to make the <i>Hunley</i> operate more like a <i>David</i> , attacking with a spar torpedo.	26-27
The Davids and the Hunley	<p>Explain that on the night of 17 February 1864, the <i>Hunley</i> crept out of the harbor and headed toward the Union blockade line. Approaching the Union sloop <i>Housatonic</i>, the <i>Hunley’s</i> commanding officer, Lieutenant George Dixon, rested the men and then had them flood the ballast tanks to the point the deck was awash. Then they cranked hard to plunge the spar torpedo into the ship’s side.</p> <p>Explain that something went wrong after the spar was set, and the charge exploded before the <i>Hunley</i> could get away. The <i>Housatonic</i> sank in less than five minutes, followed shortly thereafter by the <i>Hunley</i> and her fifth brave crew. This was the first undersea boat to sink an enemy ship in battle. No other attempts were made to build a submarine during the Civil War. (The <i>Hunley</i> was raised in August, 2000 and transported to Charleston. Remains of her crew were found aboard the ship, and were interred in Charleston’s Magnolia Cemetery in 2004.)</p>	28-29

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Confederate Privateers, Blockade Runners, and Cruisers	Explain that although the Confederates commissioned several privateers during the early days of the war, by mid-1862 most had been sunk or captured by Union naval forces. Their efforts were hampered somewhat by the Declaration of Paris of 1856. The declaration, signed by all major European countries except Spain, declared privateering illegal. Early on, however, the Southern privateers forced many Union ships to transfer to foreign registry to avoid them. Thus began a great decline in the American Merchant Marines that has lasted to this day.	30
Confederate Privateers, Blockade Runners, and Cruisers	Explain that another much more profitable Confederate maritime enterprise arose during the war called blockade running. By some estimates, as many as 1,500 blockade runners saw service during the Civil War. Because the Union did not have sufficient ships to effectively blockade the entire 3,500-mile Southern coast until near the end of the war, blockade running was a very profitable business worth the risks involved. Salt that usually sold for \$6.50 a ton would bring \$1,700 a ton in Richmond, and coffee jumped from \$249 a ton to \$5,500. Even in 1863, when the Union blockade was beginning to make its presence felt, the odds of capture were only one in four.	31
Confederate Privateers, Blockade Runners, and Cruisers	Explain that the most effective Confederate Navy effort against Union shipping was commerce raiding conducted by commissioned naval cruisers. These cruisers were mostly foreign-built with foreign crews commanded by Southern officers. After capturing their prizes, the cruisers simply burned them. Thus continued the decline of the Northern merchant marine begun by the privateers. Some shipping companies went out of business. Over 600 American ships transferred to foreign registry, more than half of these in 1863, when the Confederate cruiser <i>CSS Alabama</i> ran amok on the high seas.	32
Confederate Privateers, Blockade Runners, and Cruisers	Explain that the cruisers did achieve their primary purpose for the South, which was, weakening the blockade. Over 100 Union ships were kept busy tracking down a dozen Confederate raiders. <i>CSS Chickamauga</i> was a cruiser whose purpose was to weaken the blockade. The <i>Chickamauga</i> kept over 100 Union ships busy. Explain that the most famous and successful of the Confederate cruiser skippers was Captain Raphael Semmes. His first ship, the <i>CSS Sumter</i> , captured seventeen Union ships before being cornered by the Union Navy in Gibraltar.	33
Captain Semmes and the CSS Alabama	Explain that Semmes sold the <i>CSS Sumter</i> and made his way to England. There he learned a new cruiser was being built in a British shipyard for a Confederate agent, without British government approval. Explain that on her trial run, the ship was sailed to the Portuguese Azores, where officials looked the other way when a chartered British ship transferred a battery of six 32-pounders and other armament to the ship. Semmes then took the ship outside territorial waters to perform a ship-commissioning ceremony. He read his Confederate Navy orders, mustered his crew of volunteers, English and Irish adventurers, and raised the Confederate ensign. The <i>CSS Alabama</i> was a ship of war.	34
Video 1 of Captain Semmes and the CSS Alabama	Show video 1 of Captain Semmes and the CSS Alabama	35
Check on Learning Questions A(Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	36

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Captain Semmes and the CSS Alabama	Explain that Semmes took twenty ships in the North Atlantic over the next two months, then sailed to the Caribbean. He captured a number of ships there, and then moved into the Gulf of Mexico. Off the coast of Galveston, he tricked a Union gunboat away from other Union Navy support and quickly sank her. For eighteen months Semmes cruised the world's oceans—the Caribbean, South Atlantic, Indian Ocean, Bay of Bengal, and South China Sea. His crew exhausted and his ship badly in need of repairs, he brought the <i>Alabama</i> into the French port of Cherbourg on 11 June 1864 and requested docking.	37
Video 2 of Captain Semmes and the CSS Alabama	Show video 2 of Captain Semmes and the <i>CSS Alabama</i>	38
Captain Semmes and the CSS Alabama	<p>Explain that in the harbor, the <i>Alabama</i> was spotted by the American consul. He telegraphed Captain John Winslow of the U.S. sloop <i>Kearsarge</i>, then off the coast of Holland. Three days later, the Union ship arrived off Cherbourg. French authorities refused Semmes docking rights, so he refueled and challenged Winslow to a single-ship duel outside French territorial waters.</p> <p>Explain that on 19 June the <i>Alabama</i> steamed out of port, following the <i>Kearsarge</i> into international waters. A French ironclad followed and anchored at the 3-mile limit, and an English yacht, the <i>Deerhound</i>, stood by to observe the action. Thousands of spectators lined the shore to see the battle. The ships fired a number of broadsides without much effect because of the long range. Then the <i>Kearsarge</i> came about, and the two ships steamed in a broad circle half a mile apart seeking to rake each other. Soon the <i>Kearsarge</i> took control of the situation. The <i>Alabama</i> did not have the speed, and much of her ammunition was ineffective. After an hour of battle, the <i>Alabama</i> was sinking, while the <i>Kearsarge</i> was only slightly damaged.</p>	39
Captain Semmes and the CSS Alabama	<p>Explain that Semmes tried to beach his ship, but Winslow cut in front and raked the <i>Alabama</i> again. Water rushing into the Confederate ship extinguished her boilers, and Semmes struck his colors. As the <i>Alabama</i> began to sink, the <i>Deerhound</i> came in to pick up survivors. Semmes and forty of his crew were taken to England, escaping capture.</p> <p>Explain that the <i>Alabama</i> had captured more than sixty Union ships during her commerce raiding, destroying most at sea. The Northern steamship lines suffered huge losses. Because the raider was built in Britain, the British government later had to pay \$15.5 million in claims as the result of an international court ruling in Geneva, Switzerland.</p>	40
Captain Semmes and the CSS Alabama	Explain that other Confederate raiders also enjoyed much success against Northern shipping. One, the <i>CSS Shenandoah</i> , commanded by Captain James Waddell, wreaked such havoc among Union whaling ships in the Aleutian Islands near Alaska that she all but destroyed the American whaling industry. Altogether the raiders sank about 5 percent of all Union merchant ships that sailed during the war. Costly as this was, these losses did not have much effect on the outcome of the war, mainly because more and more cargo was carried by neutral ships safe from Confederate attack. However, American merchant shipping was dealt a blow from which it never recovered.	41
The Battle of Mobile Bay	Explain that following their victories at Vicksburg and Gettysburg, the Union armies shifted their attention to central Tennessee. In several fierce battles around Chattanooga, Grant opened the northwestern door to Georgia. Promoted by Lincoln to become supreme commander of all Union forces, Grant now went to Virginia to	42

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	command the Army of the Potomac. He left General Sherman in command of the western army with orders to march on Atlanta, Georgia.	
The Battle of Mobile Bay	Explain that the impending Atlanta campaign pushed ahead Admiral Farragut's plans to close off Mobile, Alabama, the last of the Confederacy's Gulf ports. Sherman figured that a naval assault on Mobile would cause the Confederates to move units defending Atlanta to the Gulf.	43
The Battle of Mobile Bay	Explain In July 1864, therefore, Farragut was given additional monitors and an amphibious troop contingent to besiege and capture the forts guarding the entrance to Mobile Bay. Mobile was a strategic port for the South. It had been the leading cotton-shipping port of the United States before the war. Accordingly, the Confederates had prepared defenses for the harbor stronger than any other on their coast. Three strong forts guarded the outer entrance to the bay. Fort Gaines on Dauphine Island and Fort Morgan protected the main entrance. Ships had to pass directly under the guns of Fort Morgan to enter Mobile Bay. Pilings formed a submerged obstruction 2 miles long from Fort Gaines toward the main channel. A triple line of 200 moored torpedoes (mines) extended that barrier to within a quarter of a mile of Fort Morgan. A buoy marked the eastern end of the minefield, which left only a 150-yard-wide channel for blockade runners.	44
Video on the Battle of Mobile Bay	Show video on the battle of Mobile Bay	45
The Battle of Mobile Bay	Explain that the key to the Mobile defenses was a brand-new Confederate ironclad, the <i>CSS Tennessee</i> , from which Admiral Buchanan flew his flag. The ship, though better built than the <i>CSS Virginia</i> , still had design flaws. It had only 6 knots of speed, its steering chains were exposed topside, and its gun-port shutters easily jammed. Three other small gunboats completed the small Confederate fleet with a total of 16 guns, compared to Farragut's battle force of eighteen ships and 159 guns. In the morning of 4 August 1864, Farragut landed army units on Dauphine Island to lay siege to Fort Gaines. The next day his fleet started up the channel, with the monitors closest to Fort Morgan, other ships lashed together in pairs, and larger ships facing the fort.	46
The Battle of Mobile Bay	Explain that the Union monitors were no faster than the <i>Tennessee</i> , but they had heavier armor and 15-inch and 11-inch Dahlgren smoothbore guns, compared to the Confederate's 7-inch and 6.4-inch rifles. The Union monitor <i>Tecumseh</i> headed the van, her commanding officer concentrating his attention on the <i>Tennessee</i> rather than his navigation. He ran into a huge mine that exploded and ripped out her bottom. The ship sank almost instantly, taking most of her crew of 100 down with her. Explain that the other monitors kept going, however, in order to avoid disaster. As it was, the wooden frigates headed by the <i>Brooklyn</i> heard confused reports about objects in the water ahead and stopped in the center of the channel. The entire federal line was in danger of colliding with one another.	47
The Battle of Mobile Bay	Explain that Farragut now was faced with the most important decision in his career. He climbed into the rigging of his flagship, the <i>USS Hartford</i> , and surveyed the scene. He saw that he must go ahead into the danger of the minefield or turn back with a major naval defeat on his hands. He took a calculated risk, figuring most of the mines had been in the water so long that they were probably ineffective due to leakage. His voice shouted out the now-famous words "Damn the torpedoes!" He then ordered Captains Jouett of the gunboat alongside and Drayton of the <i>Hartford</i> , "Four bells! Captain Drayton, go ahead! Jouett, full speed!"	48

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The Battle of Mobile Bay	Explain that the ships moved through the minefield, often bumping and scraping the easily seen black mines. Not a single one detonated. The entire Union battle line swept into the bay, and into the charging Confederate force	49
The Battle of Mobile Bay	Explain that Admiral Buchanan tried desperately to ram one of the Union's wooden ships, but it skipped out of his way. Buchanan wanted to keep the Union ships bunched up at the entrance where the fort's guns could be brought to bear. Two Union monitors rammed the <i>Tennessee</i> , damaging themselves more than their enemy. The <i>Hartford</i> now unleashed a full broadside into the <i>Tennessee</i> . By this time, all of the ships had moved several miles north of Fort Morgan, meaning the fort's guns could not help the Confederate ships. Now, the Union ships began closing in. The Confederate gunboat <i>Selma</i> was forced to surrender, the <i>Gaines</i> was sunk, and the <i>Morgan</i> escaped to the city. The <i>Tennessee</i> retired under the guns of Fort Morgan. Farragut anchored the Union fleet 4 miles north of Fort Morgan and ordered the crews to breakfast. They had scarcely finished when Buchanan charged forth again. He intended to sink the <i>Hartford</i> .	50
The Battle of Mobile Bay	Explain that the Union ships weighed anchor, surrounded the <i>Confederate</i> , and began to fire point-blank. Buchanan could do little but maneuver slowly. He got off some good shots, but his ammunition was poor and often did not fire. Gradually, the <i>Tennessee's</i> gun ports were jammed and the steering chains cut. The stack was shot away, so her gun deck was filled with suffocating heat and fumes. Admiral Buchanan was wounded. As the entire Union fleet closed in for the kill, Buchanan authorized the <i>Tennessee's</i> captain to surrender. It was the end of the Confederate Navy. The forts quickly surrendered. No serious attempt to capture the city itself was made until the spring of 1865. The war had now passed the city by, and it was lost to the Confederacy.	51
The Battle of Mobile Bay	Explain that Sherman, who had been moving slowly toward Atlanta, now broke loose and defeated the Confederates in three sharp battles. The city fell on 2 September 1864. He then set out with 60,000 shock troops with light rations, living off the countryside, and in what became known as "Sherman's March to the Sea," cut a devastating path 60 miles wide to the coast, wiping out the Confederacy's last agricultural area. Savannah fell in December, and he surged northward into the Carolinas. Charleston fell on 18 February. Grant's master plan had now confined Lee to the Petersburg-Richmond area. The only port still open to Confederate blockade runners was Wilmington, North Carolina, connected to Richmond by rail.	52-53
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	54
Fort Fisher	Explain that both sides prepared for the next assault. The Confederates heavily reinforced Fort Fisher and repaired and extended the fortifications. Meanwhile, Grant sent General Alfred Terry to head an 8,000-man Army landing force, the number the Navy had initially requested. With Admiral Porter's fleet bombarding in direct support, Terry's force landed on 13 January 1865 and dug in north of the fort, cutting off any hope of help from Wilmington. Terry had his men dig trenches and worked to within 500 yards of the fort, while Porter's fleet rained shells on the besieged defenders.	55
Fort Fisher	Explain that on 15 January, the Navy renewed its firing. A Navy landing force of 1,600 sailors and 400 Marines then landed on the sea face of the fort, in coordination with an attack by Terry's army from the north. The Navy-Marine Corps effort was repulsed with over 300 casualties, and the survivors regrouped on the landing beach. The Army succeeded in breaching the northern parapets just as the defenders were recovering from the naval assault. Calling for fleet support, Terry's forces moved forward with	56

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	<p>naval bombardment just ahead. Caught between Terry’s forces and the naval landing force, the 1,800 Confederate survivors surrendered.</p> <p>Explain that the Fort Fisher expedition was of special interest since it was the only successful large-scale joint amphibious attack against a strongly fortified position during the war. It showed the value of heavy supporting fire by ships. It also showed that well-planned Army-Navy assaults could be successful against even the best defenses.</p>	
Fort Fisher	Explain that when Navy Secretary Welles informed Lincoln of the victory at Fort Fisher, the president suddenly realized, “Why, there is nothing left for your ships to do!” He was correct.	57
Lee Surrenders	Explain that Grant was now in a position to outflank the defenses of the Richmond-Petersburg position. He kept up relentless attacks through the winter, suffering heavy casualties. Grant’s losses, however, were quickly replaced. Though Lee suffered fewer losses, he had no reserves on which to call. In desperation, Lee launched a final attack on Grant’s lines on 25 March 1865. He was repulsed with heavy losses and forced to abandon Petersburg.	58-59
Video 1 on Lee Surrenders	Show video 1 on Lee’s Surrender	60
Lee Surrenders	<p>Explain that on 9 April, at Appomattox Court House, Virginia, Lee surrendered his command to General Grant in the parlor of Wilmer McLean’s home.</p> <p>Explain that like Lincoln, Grant sought only to bring an end to the war and return the nation to peace. He gave Lee’s men food and allowed them to keep their horses for the spring plowing. He paroled the Confederate officers and men on their word and sent them home. But for a few skirmishes, the war was over.</p>	61
Video 2 on Lee Surrenders	Show video 2 on Lee’s Surrender	62
Lee Surrenders	Explain that on 14 April 1865, the now retired Major General Robert Anderson raised the same flag over Fort Sumter that he had lowered as Major exactly four years earlier. On 10 May Jefferson Davis was captured near Irwinville, Georgia, by a detachment of the 4th Michigan Cavalry. The Confederate government ceased to exist. The Union was preserved.	63
Aftermath of the Civil War	Explain that nearly 540,000 servicemen from both sides died during the Civil War. It was the nation’s most costly wartime toll. About \$5 billion was spent by both sides. Destruction in the South was devastating, and the South was stricken with poverty and famine for many years. The spirit of defeat oppressed the people even longer.	64
Aftermath of the Civil War	Explain that many changes occurred during the war. Because of the scarcity of whale oil, for example, by war’s end, petroleum, which had been discovered at Titusville, Pennsylvania in 1858, was used to make kerosene for lamps throughout the nation. Food canning was developed by Gilbert Van Camp in Indianapolis. The Union Army soon was living on canned meats and vegetables. Mines came into being as an effective weapon of war. Some thirty-five Union ships were sunk by Confederate mines, more than from any other cause. Torpedoes on the ends of spars were tried. Ironclad ships were proven effective. The idea of a submarine, though not entirely successful, was resurrected. Balloons were used with little success as observation platforms, and the idea of aerial reconnaissance began.	65-66

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Aftermath of the Civil War	Explain that medical care of wounded men received great attention. The U.S. Navy fitted out its first hospital ship, the <i>Red Rover</i> . It was a side-wheeler put into service in 1862 at St. Louis on the Mississippi River. The <i>Red Rover</i> was staffed by female nurses and had operating rooms, elevators, bathtubs, and ice vaults. Dorothea Dix and Clara Barton, who later founded the American Red Cross, recruited both men and women to perform nursing duties at the battlefronts and in Army hospitals.	67
Aftermath of the Civil War	Explain that cameras were used to record the sights and scenes of men and battle for the first time. Railroads and telegraph, though existing before the war, became indispensable communication links.	68
Aftermath of the Civil War	Explain that the Navy itself had grown to more than 600 ships, including sixty armored ironclads and monitors. Nearly 60,000 officers and men were serving in a Navy that had numbered only about 9,000 at the start of the war. That the Navy played a vital role in the victory of the Union is indisputable. Explain that Confederate General Robert E. Lee proved to be the superior tactician in the field. However, the overall grand strategy of the Union under Lincoln and Grant gradually forced him into submission because of lack of men, food, and military supplies. Despite the final defeat of Lee in Virginia, the battles around the edges of the Confederacy were really the decisive battles of the war. With the exception of the final battle for Fort Fisher, which sealed Lee's fate at Petersburg and Appomattox, the Navy played a relatively small role in the holding and maneuvering actions in the eastern theater.	69
Aftermath of the Civil War	Explain that the Confederacy's attempts to sustain itself by interior lines of communications failed in the face of the superior naval power around it, as the Continental strategists advocated. Movement by sea forces proved to be faster than movement by land forces over the poor roads and railroads of the South. These are geopolitical and strategic lessons on sea power versus land power that have been studied by generations of strategists since the Civil War.	70
In Summary	<div> <div>12 Apr. 1861</div> <div>Civil War begins</div> </div> <div> <div>8 Nov. 1861</div> <div>Trent affair</div> </div> <div> <div>9 Mar. 1862</div> <div><i>Monitor</i> vs. <i>Merrimack</i></div> </div> <div> <div>24 Apr. 1862</div> <div>New Orleans surrenders</div> </div> <div> <div>17 Sept. 1862</div> <div>Battle of Antietam</div> </div> <div> <div>1-3 July 1863</div> <div>Battle of Gettysburg</div> </div> <div> <div>4 July 1863</div> <div>Vicksburg surrenders</div> </div> <div> <div>17 Feb 1864</div> <div>CSS <i>Hunley</i> sinks <i>Housatonic</i></div> </div> <div> <div>19 June 1864</div> <div>CSS <i>Alabama</i> is sunk</div> </div> <div> <div>5 Aug. 1864</div> <div>Battle of Mobile Bay</div> </div> <div> <div>15 Jan. 1865</div> <div>Ft. Fisher surrenders</div> </div> <div> <div>9 Apr. 1865</div> <div>Lee surrenders</div> </div>	71-72
Review Question	The Review Question is "Discuss how early submarine craft were different from today's subs." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	73
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	74

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Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	75
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III. Supplemental Activities -

A. In Class Activity:

Supplies required: White board or MOBI

When: This is a good activity to do at the end of class.

- With the class: Today there are 27 US cruisers. 7 of these named after famous Civil War battles. Name all 27 US cruisers and underline the ones named after Civil War battles.

Answer:

Ticonderoga, **Yorktown**, Vincennes, Valley Forge, Thomas S. Gates, Bunker Hill, **Mobile Bay**, **Antietam**, Leyte Gulf, San Jacinto, Lake Champlain, Philippine Sea, Princeton, Normandy, Monterey, **Chancellorsville**, Cowpens, **Gettysburg**, Chosin, Hué City, **Shiloh**, Anzio, Vicksburg, Lake Erie, Cape St. George, Vella Gulf, and **Port Royal**

B. Take Home Activity: Both the Union and Confederate Navies played key roles in the Civil War. Construct a five minute presentation on how the Navies assist in the war efforts. Include information about at least one major naval battle and give at least two innovations used by the Navies.

IV. Evaluation - see CPS database for chapter test questions.

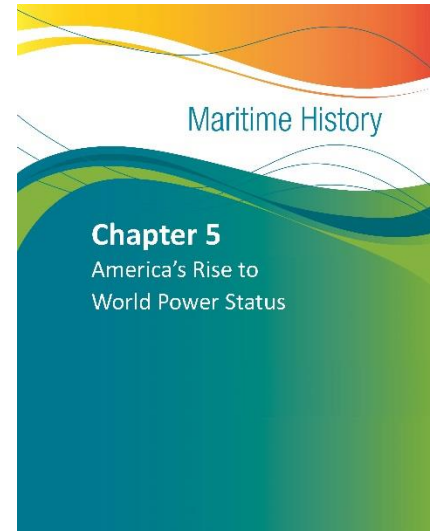
Module 1 Chapter 5: NS2M1C5 – America’s Rise to World Power Status

What Students Will Learn to Do:

Demonstrate the knowledge of the Navy’s role from The Rise to World Power Status, 1865-1914

Skills and Knowledge to be Gained:

1. Describe the changes in foreign relations and technology that affected the U.S. Navy following the Civil War
2. Describe the education and training programs that were developed after the Civil War for the U.S. Navy
3. Describe five major contributions Alfred T. Mahan made to modern navies
4. Explain how the United States rebuilt its Navy or contributed to its expansion following the Civil War
5. Explain American reaction to the sinking of the USS Maine and the war preparations made by the United States before the start of the Spanish-American War
6. Describe the (Operations in the Pacific) Battle of Manila Bay during the Spanish-American War
7. Describe the Caribbean Operations leading up to the Battle of Santiago de Cuba
8. Describe the advances in naval power and technology under Theodore Roosevelt
9. Explain America’s international relations from 1903 until World War I
10. Explain the difficulties and importance of building the Panama Canal



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Writing

- W.9-10.1. Write arguments to support claims in an analysis of substantive topics or texts...
- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...

Module 1 Chapter 5: NS2M1C5 – America’s Rise to World Power Status

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Civic and Political Institutions

- D2.Civ.3.9-12. Analyze the impact of constitutions, laws, treaties, and international agreements on the maintenance of national and international order.

Dimension 2. Geography

- D2.Geo.2.9-12. Use maps, satellite images, photographs, and other representations...

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...
- D2.His.14.9-12. Analyze multiple and complex causes and effects of events in the past.

Dimension 4. Communicating Conclusions and Taking Informed Action

- D4.2.9-12. Construct explanations using sound reasoning, correct sequence, examples, and details with significant and pertinent information and data...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor’s Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor’s Guide.

Chapter 5 / Section 1: NS2-M1C5S1 – Post-Civil War Recovery to the Spanish American War

(Section 1 of 2)

What Students Will Learn to Do:

Demonstrate the knowledge of the Navy's role from The Rise to World Power Status, 1865-1914

Skills and Knowledge to be Gained:

1. Describe the changes in foreign relations and technology that affected the U.S. Navy following the Civil marine
2. Describe the education and training programs that were developed after the Civil War for the U.S. Navy
3. Describe five major contributions Alfred T. Mahan made to modern Navies
4. Explain how the United States rebuilt its Navy or contributed to its expansion following the Civil War
5. Explain American reaction to the sinking of the *USS Maine* and the war preparations made by the United States before the start of the Spanish-American War
6. Describe the (Operations in the Pacific) Battle of Manila Bay during the Spanish-American War

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	KeyTerm Definitions	Opening Question	Warm Up Questions	Introduction	Educational Renaissance	Check On Learning A
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Mahan and Sea Power	Postwar Foreign Naval Developments	The United States Rebuilds Its Navy	Check on Learning B	The Spanish-American War of 1898	Operations in the Pacific	Review Questions
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Closing Questions	Call for Other Questions
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Key:

Textbook Content	Student Engagement and Assessment
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Chapter 5 / Section 1: NS2-M1C5S1 – Post-Civil War Recovery to the Spanish American War

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 5. Place a checkmark beside the NS2-M1C5S1 PowerPoint presentation, and these two CPS question deck files: NS2-M1C5S1 - Key Terms and NS2-M1C5S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will discuss the decline of the Navy, the educational renaissance, and the people who influenced naval strategy. During this postwar era, the Navy was placed on the back burner, and within a 5-year period, the fleet dwindled from nearly 700 ships to fewer than 200 ships. Only 50 ships were in commission, and most of them were already obsolete compared to those in European navies. This decline persisted despite calls for a stronger Navy and merchant marine.</p> <p>We will also discuss the rebuilding of the Navy, the Navy's involvement in the Spanish-American War, international relations after the war, and the building of the Panama Canal and its impact.</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-7
Opening Question(Random Pick a Student – "RPS")	This Opening Question is "What was the state and size of the U.S. Navy at the end of the Civil War?" Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on the rise to world power status.	8
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	9

Chapter 5 / Section 1: NS2-M1C5S1 – Post-Civil War Recovery to the Spanish American War

Introduction	Explain that the usual postwar demand to save money quickly reduced the U.S. Navy in size after the Civil War. Ships were expensive. So they were tied up at piers, and their sailors went back to the farms and factories or headed West to seek adventure and fortune. Within five years the fleet had dwindled from nearly 700 ships to fewer than 200. Only 50 of these were in commission, and most were already obsolete.	10
Introduction	Explain that in 1871 the crews of several shipwrecked American trading vessels were murdered by Korean armed forces. In response, the U.S. Asiatic naval squadron launched an amphibious assault on five forts guarding the approaches to Seoul, the capital of Korea. They captured the forts after inflicting heavy casualties.	11
Introduction	Explain that the purpose of this was to show the Koreans that the United States wanted no further uncivilized actions against American merchantmen. The point was made forcefully, and such attacks did not occur again. Advocates of a stronger Navy pointed to this as an example of the need for new and better ships, but Congress denied those requests. In 1881 a treaty was negotiated between the two countries, the first such treaty that Korea had signed with a Western nation. A naval officer was the American representative at the negotiations.	12
Introduction	Explain that in 1873 there was a brief threat of war with Spain. The Spanish authorities captured a Cuban ship crammed with revolutionaries seeking to make Cuba independent. The ship was illegally flying the U.S. flag in order to avoid interference. The Spaniards shot many of the conspirators, some of them Americans. The issue was settled when Spain paid a monetary tribute to satisfy American claims. By that time the U.S. fleet had shrunk even further and was in no shape to take on any enemy navy.	13
Introduction	Explain that in addition to decreasing the Navy's size, Congress and some senior officers were in favor of having the fleet to go back to sail as propulsion because of the cost of coal. Existing boilers and engines were replaced with smaller ones or removed. Captains were warned that if they exceeded their allotment of coal, they would be responsible for the cost.	14
Introduction	Explain that in Europe this was a time of technological progress, much of it stimulated by studies of naval actions during the Civil War: the development of self-propelled torpedoes, improved armor plate, large rifled guns, and powerful engines. In 1873 the British launched the prototype (preliminary model) of the modern battleship; it could steam to America and back without refueling. But a series of Secretaries of the Navy did nothing to stop the decline of U.S. sea power.	15-16
Introduction	Explain that the HMS Dreadnought was launched in 1875	17
Introduction	Explain that by 1878 fewer than 6,000 men remained in the U.S. Navy, most of them foreigners. There were too many officers in the upper ranks, and few ships to assign them to, resulting in slow promotions and little incentive for younger officers. By 1881 the U.S. Navy ranked twelfth in the world, and over 80 percent of its men were not U.S. citizens. Naval officers often had to learn four or five different languages to communicate with their crew.	18
Educational Renaissance	Explain that the Naval Academy, which had been moved to Newport, Rhode Island, during the war, was returned to Annapolis, Maryland in 1865. Under new Superintendent Admiral David Porter and Commandant Lieutenant Commander Stephen B. Luce, the Academy acquired a brilliant staff of young administrators and instructors who were veterans of the war. They raised academic standards, expelling midshipmen who did not measure up. They instituted an honor system, set up a program of athletics, and encouraged creative expression and healthy social activities.	19-21

Chapter 5 / Section 1: NS2-M1C5S1 – Post-Civil War Recovery to the Spanish American War

	By 1869 the Academy's engineering curriculum and physics department had achieved a high academic reputation, which continues to this day. In the early 1870s the department attracted a brilliant young immigrant from Germany named Albert Michelson, who, after graduating and serving as an instructor at the Academy, went on to head the department of physics at the University of Chicago. He became the first American recipient of the Nobel Prize for Physics in 1907 for discovering the speed of light.	
Educational Renaissance	Explain that in 1873 the U.S. Naval Institute was established on the grounds of the Naval Academy. Composed of officers and civilian instructors at the academy interested in reform, the institute's purpose was to advance professional and scientific knowledge about the U.S. Navy, other world navies, and the maritime industry. It soon became a major forum for ideas to improve the fleet. In 1875 it began publishing a journal called the U.S. Naval Institute Proceedings. The Proceedings was a leader in criticizing the condition of the fleet, pointing out both the commercial benefits and naval requirements of a strong American maritime force. This professional journal is still the foremost naval and maritime publication of its type in the world. Eventually the Naval Institute also became an important publisher of books on naval matters.	22-23
Educational Renaissance	Explain that also in 1875, Luce, now a Commodore, was instrumental in starting a system of training naval enlisted men on station ships before they were transferred to training vessels to be taught gunnery and seamanship. This was the forerunner of the Navy's modern training system for enlisted men.	24
Educational Renaissance	Explain that in 1884 after a brilliant career in sea billets (job assignments aboard ships), including the Naval Academy training squadron, Luce convinced the Secretary of the Navy to establish the Naval War College in Newport, Rhode Island. Luce had argued that naval warfare of the future would require senior officers well- schooled in the broad principles of grand strategy, modern fleet tactics, naval history and policy, and international law. The college was the first institution of its kind in the world. Among the officers selected by Luce for the first Naval War College staff was Captain Alfred Thayer Mahan, professor of naval history, who would soon make history himself.	25
nEducational Renaissance	Explain that today's naval training programs for both officers and enlisted personnel stem directly from Commodore Luce's efforts. He also started fleet exercises as a means of battle practice, and until his death in 1917 at the age of ninety, he fought tirelessly for improvements in ships and gun design. His work contributed immensely to improving the morale of the service following its post-Civil War decline.	26
Check on Learning Questions A(Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	27
Mahan and Sea Power	Explain that in 1886 Commodore Luce was ordered to sea duty again, and Captain Alfred Thayer Mahan was appointed to relieve him as President of the Naval War College. As Mahan studied naval history in preparation for assuming his duties, he became convinced that the importance of sea control in human history had never been fully appreciated nor properly communicated. From this time on he became one of the foremost proponents of sea power as a means to achieve world power status. In 1890 he published his findings in The Influence of Sea Power upon History, 1660-1783, which became world famous as the foremost text on sea power and naval strategy. He published two more studies in 1892 and 1897.	28
Mahan and Sea Power	Explain that Mahan argued that it was command of the sea that had enabled Britain to create its empire, reap the profits of maritime commerce, and defeat the land powers that tried to challenge it on the trade routes of the world. He believed that a seafaring	29

Chapter 5 / Section 1: NS2-M1C5S1 – Post-Civil War Recovery to the Spanish American War

	<p>nation could, if led by an enlightened and dynamic government, use the sea to become a world power. For the United States, or any other nation desiring to become a world power, the lesson was clear: national survival depended on control of the sea. The country needed to build a fleet of ships that could defeat any enemy fleet at sea and break up any blockade that might be deployed against it. To support this fleet, overseas bases were needed anywhere sea communications might be threatened. And, for security purposes, such bases would best be located in overseas colonies under control of the aspiring maritime power.</p>	
Mahan and Sea Power	<p>Explain that Mahan's work was a brilliant study of maritime history and naval strategy. It immediately received acclaim worldwide, especially in Europe and the Far East, where it was used to help justify the large naval construction programs in which the major nations in these regions were then engaged. It also seemed to justify the new imperialism that had become rampant among these nations in the last part of the nineteenth century. Mahan was honored by the queen of England and given honorary degrees. German Kaiser Wilhelm II ordered that copies of Mahan's work be placed on all ships of the German Navy.</p>	30
Mahan and Sea Power	<p>Explain that the Japanese government provided copies to all its army and naval officers, political leaders, and schools. At home, Mahan's ideas were welcomed by advocates of a strong navy—in particular, by a rising young politician named Theodore Roosevelt—and by proponents of American expansion across the Pacific, the annexation of Hawaii, and the building of a canal across either Nicaragua or Panama.</p>	31
Postwar Foreign Naval Developments	<p>Explain that during the years following the American Civil War, the British began using iron for all new warship construction. In 1872 the French introduced the use of steel, and soon the British followed suit. Other improvements in armor, propulsion, and armament followed. As a result of their naval building programs, the British had become the preeminent naval power in Europe by the 1890s. Meanwhile, the Germans, not wanting to fall too far behind the British, embarked on a strong naval building program of their own in order to challenge for control of the North Sea region. Simultaneously they began imperialistic moves into the western Pacific, taking control of several of the islands there in order to establish colonies and bases.</p>	32
Postwar Foreign Naval Developments	<p>Explain that in the Pacific the island nation of Japan had been made aware of the advances in Western naval and other military technology by the contacts with American Commodore Matthew Perry in the 1850s, which opened the door to trade with the West. The strategic problem facing Japan in the last half of the nineteenth century was in many ways similar to that facing Britain in Europe. Both were island nations located off continents that were dominated by aggressive land powers. What Japan feared most during these years was the emergence of China as a naval power and the march of Russia toward ice-free ports in the region.</p>	33
Postwar Foreign Naval Developments	<p>Explain that the Japanese had realized that neither of these potential adversaries could bring full strength to bear against them as long as they remained in control of the seas in the western Pacific. Thus, Japan too had begun a vigorous naval shipbuilding effort in the latter part of the nineteenth century. Because of its naval superiority, Japan defeated China in the Sino-Japanese War of 1894-95, forcing the Chinese to withdraw from Korea, surrender to Japan the islands of Formosa and the Pescadores, and relinquish control of Port Arthur in Manchuria. Later, the Japanese gained worldwide acknowledgment as the major power in the region when they defeated the Russian Far Eastern fleets during the Russo-Japanese War of 1904-5, gaining control of southern Sakhalin Island as a result. It is worth noting that in both these conflicts, the Japanese launched major preemptive naval attacks on enemy forces prior to formal declarations of war.</p>	34-36

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The United States Rebuilds Its Navy	Explain that partly in response to the naval building programs overseas, and partly to ensure a foreign market for growing quantities of U.S. manufactured goods, in the early 1880's pressure began to mount for the United States to rebuild its Navy and merchant marine. Both had been suffering from neglect since the end of the Civil War. Congress established the Naval Advisory Board in 1881, and in 1883 it authorized the building of three new protected cruisers of the latest European design. These were followed in 1886 with authorizations for America's first battleships, the Texas and the Maine. Though these proved suitable only for coastal defense, they provided a means for American shipyards to learn how to build modern warships. They also helped establish the American steel industry because of the steel armor plating used in these ships. By the end of the 1880s, American shipyards were producing fine cruisers such as the New York and Olympia, which compared favorably with any in the foreign navies.	37-38
The United States Rebuilds Its Navy	Explain that the building program continued into the 1890s, spurred on by Mahan's publications on sea power. The Naval Act of 1890 called for the construction of three new first-class battleships—the Indiana, Massachusetts, and Oregon—plus additional cruisers, torpedo boats, and gunboats. In 1892 Congress authorized the battleship Iowa, which was somewhat heavier and faster than the Indiana class. In 1897, one of the greatest American proponents of Mahan's views on sea power, Theodore Roosevelt, became Assistant Secretary of the Navy in the McKinley administration. Roosevelt firmly believed that war with Spain over Cuba was inevitable, and he insisted that the U.S. fleet continue to be built up to maximum readiness. Thus, on the eve of the Spanish-American War in 1898, the United States had a fleet that was respectable by any measure: four first-class battleships, two second-class battleships, two armored cruisers, ten protected cruisers, a number of gunboats, old monitors that could be used for coastal defense, and torpedo boats.	39-41
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	42
The Spanish-American War of 1898	Explain that for years Americans had resented Spain's harsh rule over Cuba, the most important Spanish colony in the New World. Cuban revolutionaries had been inciting insurrections against this rule for more than twenty years, which by 1895 had resulted in a state of near anarchy and open rebellion. Spanish authorities had been ruthless in their attempts to suppress the rebellion and retain control of the island, resulting in the killing of thousands of civilians.	43
The Spanish-American War of 1898	Explain that partly in response to this human suffering, and certainly because of economic concern over some \$50 million worth of American investment in sugar cane plantations and \$100 million in annual sugar trade, support grew for the United States to intervene in Cuba, perhaps even to annex it from Spain, by force if necessary. Explain that yellow journalism (stories written to incite an emotional response) in U.S. newspapers, including publication of a letter stolen from the Spanish ambassador describing President McKinley as "weak," further whipped up American feelings in support of war with Spain.	44
The Spanish-American War of 1898	Explain that in February 1898 McKinley sent the battleship USS Maine to Havana to protect American lives and property. On the evening of 15 February a tremendous explosion ripped the Maine apart, sinking her in minutes, and killing 266 of her 354 officers and crew. Most Americans at the time immediately blamed the Spanish for the explosion, even though the Spanish government expressed sympathy and denied any part in the incident. Several studies in recent years have indicated that the probable cause was a coal dust explosion in a forward coal bunker, which set off ammunition in a nearby magazine. In any event, the loss of the Maine brought the nation to the brink	45

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	of war with Spain.	
The Spanish-American War of 1898	Explain that although both nations tried to head off war with further negotiations over the next couple of months, neither had much doubt that war was inevitable. On 19 April Congress passed four resolutions: declaring Cuba free and independent, demanding withdrawal of all Spanish forces, guaranteeing that the United States would not annex Cuba, and directing the President to use American armed forces to enforce these resolutions.	46
The Spanish-American War of 1898	Explain that under the leadership of Assistant Secretary of the Navy Theodore Roosevelt, the Navy prepared for war. Recognizing that the Spanish-owned Philippine Islands in the Pacific region could become a key U.S. base to protect its Asian trade, in late February Roosevelt cabled Commodore George Dewey in his flagship Olympia at Hong Kong to make ready the U.S. Asiatic Fleet to attack the Spanish fleet at Manila. Roosevelt backed up the instruction by rushing the cruiser Baltimore across the Pacific with a load of shells and arranging for the purchase of two British vessels to be used as colliers (coal resupply ships). Because Cuba would be a primary objective of the war and Puerto Rico a close second, the bulk of the U.S. fleet was concentrated in the Atlantic. In mid-March the new battleship Oregon, just being completed in San Francisco, was ordered to leave immediately and begin an amazing 15,000-mile trip in sixty-six days to join the U.S. Atlantic Fleet by way of Cape Horn.	47-50
The Spanish-American War of 1898	Explain that the Spanish government alerted Admiral Cervera, commander of the home fleet, to prepare to sail to the Caribbean to defend the colonies, destroy the American fleet and naval base at Key West, and blockade the American coast. Though Cervera pointed out that his fleet was not ready to take on the superior U.S. Atlantic Fleet, he reluctantly steamed from Cadiz, Spain, to the Cape Verde Islands on 9 April with four cruisers and two destroyers.	51
The Spanish-American War of 1898	Explain that news of his sailing immediately caused a war panic all along the U.S. East Coast. To calm the frightened populace, the Navy hauled out some of its obsolete Civil War monitors and stationed them in various port cities for harbor defense, and the Army placed several old Civil War cannons along the coast. Also, a so-called Flying Squadron with a battleship and three cruisers under Commodore Winfield Schley was detached from the Atlantic Fleet and based at Norfolk for protection of the Atlantic seaboard, should Cervera's ships proceed there. The main part of the fleet, consisting of three battleships and three cruisers under Rear Admiral Sampson, was ordered to Key West, ready for offensive operations against Cuba and Puerto Rico.	52
The Spanish-American War of 1898	Explain that on April 22 the Navy Department directed Admiral Sampson to set up a blockade of Cuba. On April 25 Congress declared that a state of war had existed with Spain as of April 21. On the twenty-ninth, Admiral Cervera's fleet left the Cape Verdes and steamed to the defense of Puerto Rico. Cervera knew the poor state of his ships and the lack of training of his crews; he firmly believed he was sailing into destruction. Other European countries, however, believed that Spain would defeat the United States in a long war. Alfred Thayer Mahan predicted that America would win in "about three months."	53
Operations in the Pacific	Explain that news of the formal declaration of war reached Commodore Dewey by cable in Hong Kong the day after the cruiser Baltimore arrived with her load of ammunition. He was given twenty-four hours to get under way for the Philippine Islands and commence operations against the Spanish fleet at Manila. Besides the flagship Olympia, Dewey had three other cruisers, including the Baltimore, two gunboats, and a cutter. The Spanish squadron under the command of Admiral Patricio Montojo consisted of his flagship, the cruiser Reina Christina, and six other light	54-56

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	cruisers and three gunboats, all of which were in poor condition. Montojo realized he would have no chance at sea, so he planned to fight at anchor under the shore batteries at Cavite, a naval station south of Manila.	
Operations in the Pacific	Explain that shortly after midnight on May 1, 1898 Dewey's squadron slipped into the entrance of Manila Bay past the fortified island of Corregidor and made for Manila, 22 miles across the bay. As dawn broke, the enemy squadron was sighted off Cavite. Dewey in Olympia at the head of his column of ships immediately turned south and proceeded to within 5,000 yards of the enemy, at which point he gave the famous command to his ship's commanding officer, "You may fire when you are ready, Gridley."	57
Operations in the Pacific	<p>Explain that though the Spaniards had fought bravely, their lack of training, inferior firepower, and poor ammunition were no match for US forces. Dewey's careful preparations for war at Hong Kong had paid off. The Americans, who had drilled regularly at gunnery, made some 170 hits on the Spanish vessels. The Spaniards, who had not practiced at all, had only about 15 hits on the U.S. ships. When the news reached home, the nation was jubilant.</p> <p>Explain that while waiting for troops to arrive from the United States off Manila, Dewey was confronted by five German warships that entered the harbor hoping to pick up some of the Philippines for their empire. Dewey stood his ground and threatened to fire on any ships that tried to interfere with him. The Germans sailed away. A year later, however, Germany bought the Caroline, Marshall, Mariana, and Palau Islands, and many others, from Spain. They would become fierce issues in later naval history.</p>	58
Operations in the Pacific	Explain that en route to the Philippines, the USS Charleston, one of the escorts for the American troop convoy en route to Manila, stopped off at the Spanish island of Guam. Her commander took command of the colony in the name of the United States without firing a shot.	59
Operations in the Pacific	Explain that though not directly involved in the war, the Hawaiian Islands had become very important to the United States as a base for operations in the Philippines, and for growing American business interests in the Pacific. Some years earlier in 1894 the Americans in Hawaii had formed a provisional government and asked for immediate annexation by the United States. The request had been denied by President Grover Cleveland, who considered the Hawaiian queen the legitimate government. After Dewey's overwhelming victory in Manila Bay, however, the expansionists in Congress were so strengthened that by mid-1898 they were able to pass a joint congressional resolution for the annexation of Hawaii. In 1900 it became a U.S. territory, and in 1959 it became our fiftieth state.	60-61
Review Question	The Review Question is "List 2-3 reasons the Dreadnought became the standard for the modern battleship." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	62
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	63
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	64

Chapter 5 / Section 1: NS2-M1C5S1 – Post-Civil War Recovery to the Spanish American War

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Internet access; Take home activity handout

When: This is a good activity to do after you go over the key term imperialism.

Class question: We have defined what imperialism is today and many Americans do not know that the United States still holds territories. From the U.S. State Department website have the Cadets Make a list of the official U.S. Territories and Associated States *

Answer:

- American Samoa
- Federated States of Micronesia *
- Guam
- Midway Islands *
- Northern Mariana Islands
- Puerto Rico
- Republic of Palau *
- Republic of the Marshall Islands *
- U.S. Virgin Islands

B. Take Home Activity: We talked briefly about Alfred T. Mahan's book *the Influence of Sea Power upon History* and the affect it had on our Navy. What other navies/countries learned from this book and would become a major power? Using the handout "Major World Powers" write a brief summary of countries that you believe used these principles to help bring their countries to world power and your reasons for choices.

IV. Evaluation - see CPS database for chapter test questions.

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Activity 1: Take Home Activity- Major World Powers

Name: _____ Date: _____ Class: _____

Directions: We talked briefly about Alfred T. Mahan's book the *Influence of Sea Power upon History* and the affect it had on our Navy. What other navies/countries learned from this book and would become a major power? Write a brief summary of countries that you believe used these principles to help bring their countries to world power and your reasons for choices.

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This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Chapter 5 / Section 2: NS2-M1C5S2 – Operations in the Caribbean

(Section 2 of 2)

What Students Will Learn to Do:

Demonstrate the knowledge of the Navy's role from The Rise to World Power Status, 1865-1914

Skills and Knowledge to be Gained:

1. Describe the Caribbean Operations leading up to the Battle of Santiago de Cuba
2. Describe the advances in naval power and technology under Theodore Roosevelt
3. Explain America's international relations from 1903 until World War I
4. Explain the difficulties and importance of building the Panama Canal

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Operations in the Caribbean	Battle of Santiago de Cuba	Check On Learning A
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End of the War	The Rise to World-Power Status	International Relations	Check on Learning B	Panama Canal	In Summary	Review Questions	Closing Questions
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Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 5 / Section 2: NS2-M1C5S2 – Operations in the Caribbean

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, chapter 5. Place a checkmark beside the NS2-M1C5S2 PowerPoint presentation, and these two CPS question deck files: NS2-M1C5S2 - Key Terms and NS2-M1C5S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will discuss the decline of the Navy, the educational renaissance, and the people who influenced naval strategy. During this postwar era, the Navy was placed on the back burner, and within a 5-year period, the fleet dwindled from nearly 700 ships to fewer than 200 ships. Only 50 ships were in commission, and most of them were already obsolete compared to those in European navies. This decline persisted despite calls for a stronger Navy and merchant marine.</p> <p>We will also discuss the rebuilding of the Navy, the Navy's involvement in the Spanish-American War, international relations after the war, and the building of the Panama Canal and its impact.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-6
Opening Question(Random Pick a Student – "RPS")	This Opening Question is "List 2-3 ways the Wright brothers' successful first flight changed history." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on the operations in the Caribbean	7

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Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	8
Operations in the Caribbean	<p>Explain that as the foregoing events were taking place in the Pacific, in the Atlantic region Admiral Sampson assumed that Admiral Cervera would head directly for the Spanish port of San Juan, Puerto Rico, after leaving the Cape Verde Islands. This seemed logical because the Spanish fleet would have to replenish its coal after the transatlantic voyage. So, Sampson lifted the blockade of the Cuban coast opposite Key West and headed toward San Juan. Sampson’s progress was slowed by two unseaworthy monitors, which had to be towed by his battleships. When he finally arrived off San Juan, there was no sign of Cervera. He spent time in a useless bombardment of San Juan’s defenses, suffering eight casualties and some damage from the shore batteries.</p>	9
Operations in the Caribbean	<p>Explain that while Sampson was using up his coal and ammunition off San Juan, the wily Cervera brought his fleet near the French island of Martinique for refueling. Refused entrance there by the French, he proceeded to the Dutch island of Curaçao. After refueling there, he sailed northwest toward Cuba.</p>	10
Operations in the Caribbean	<p>Explain that the American consul in Martinique had cabled Washington as Cervera passed that island. The Navy Department then ordered Schley’s Flying Squadron to sail from Norfolk to Key West. Cervera had thus in effect outmaneuvered the Americans by guessing that Sampson and Schley would do what they did. With the Atlantic Squadron split, the Spaniards successfully eluded them both and headed toward the back door of Cuba at Santiago. Meanwhile, the <i>Oregon</i>, just entering the Caribbean after its circumnavigation of South America, stood a chance of steaming alone into the midst of the Spanish fleet.</p>	11
Operations in the Caribbean	<p>Explain that word of Cervera’s stop at Curaçao, however, indicated that the <i>Oregon</i> was safe, and that Cervera was probably headed toward Cuba. There were three ports in Cuba large enough to handle Cervera’s fleet—Havana, Cienfuegos, and Santiago. The Navy Department concluded that Cervera probably would try to reach Havana, possibly stopping at Cienfuegos for coal. Accordingly, Sampson ordered the Flying Squadron to go around the western end of Cuba to blockade Cienfuegos, while he guarded the approaches to Havana. Both the department and Sampson were incorrect again. Cervera had steamed directly to the isolated southeastern port of Santiago de Cuba, arriving on 19 May.</p>	12
Operations in the Caribbean	<p>Explain that Commodore Schley headed toward Santiago after determining that the enemy was not at Cienfuegos. But before arriving—and against Navy Department orders—he reversed course, intending to return to Key West for coal. The seas calmed on the night of 27 May, however, and he was able to take on coal from a collier at sea. His squadron finally arrived off Santiago de Cuba on the morning of the twenty-ninth. There he saw the <i>Cristóbal Colon</i>, Cervera’s best cruiser, at the harbor entrance. He laid off the harbor for two days, then bombarded it for a few minutes at extreme range with little effect. On 1 June Admiral Sampson arrived with his squadron, plus the <i>Oregon</i>. As senior officer present, Sampson took command of all U.S. naval forces and established a close blockade of the port.</p>	13-14

Chapter 5 / Section 2: NS2-M1C5S2 – Operations in the Caribbean

Battle of Santiago de Cuba	Explain that the coaling problem was partially solved on 10 June when a force of U.S. Marines from the <i>Oregon</i> went ashore at Guantánamo Bay and, after a week of fighting, drove away the Spanish garrison. This gave the fleet a secure anchorage only 40 miles from Santiago that could be used as a coaling and maintenance base. Guantánamo has been an important American naval base ever since under a treaty with Cuba.	15
Battle of Santiago de Cuba	Explain that Sampson now called on Washington to have Army troops land and take the Spanish batteries at Santiago, so he could go in with small boats and sweep the Spanish minefield before forcing an entrance to the harbor. The Army was eager to oblige, in order to take part in the war. On 20 June Major General William Shafter arrived with an Army expeditionary force of 16,000 men. He had orders to cooperate with the Navy and land near Santiago to capture the batteries. With Naval assistance, Shafter landed at Daiquiri, 16 miles east of Santiago, on 22 June without opposition. However, rather than attacking the harbor entrance batteries, General Shafter decided to capture the city instead, hoping thereby to give himself the victory.	16
Battle of Santiago de Cuba	Explain that Shafter's army found the going very rough and slow. His men were hampered by barbed-wire entanglements, poor trails, heatstroke, and typhoid fever. On 1 July the Spaniards made a strong stand at El Caney and San Juan Hill, inflicting nearly 1,500 casualties before retreating to the city's main defense lines. During this battle, Lieutenant Colonel Theodore Roosevelt's Rough Riders and a regiment of African American cavalymen swarmed up nearby Kettle Hill on foot and threw the Spaniards off. (Roosevelt had resigned his post as Assistant Secretary of the Navy in order to get into battlefield action.)	17-19
Battle of Santiago de Cuba	Explain that Shafter, shocked by his losses and ill with fever, considered retreating to escape from the Spanish forces, which were now much larger than his own. As a last resort, however, he called on the Navy to try to force the entrance of the harbor to relieve the pressure on his men. Sampson was very upset by this request, as it was asking him to risk the fleet in a narrow, twisting, mined channel to save the Army, when the Army had not proceeded on its mission of silencing the shore batteries. On Sunday morning 3 July, the exasperated Sampson turned over command of the blockading force to Commodore Schley and sailed eastward along the Cuban coast in his flagship, the cruiser <i>USS New York</i> , to meet personally with Shafter. The blockade had been further weakened that morning with the departure of the <i>USS Massachusetts</i> for Guantánamo to refuel.	20
Battle of Santiago de Cuba	Explain that though the situation looked bad to the Americans, it looked worse to the Spanish. The Spanish authorities in Havana, feeling that Santiago would probably soon fall, had directed Cervera to escape at his first chance. Seeing the blockade weakened, the Spanish admiral chose this opportunity to try to escape. He realized his move was an unlikely gamble, but he thought that this was the only way to avoid surrender of his squadron without fighting. That, he felt, would result in a terrible loss of honor, severely damage the morale of all Spanish forces, and destroy Spain's reputation in Europe.	21
Battle of Santiago de Cuba	Explain that the American fleet, somewhat relaxed in Sunday blockade routine, was caught by surprise but quickly recovered. The Americans were under way toward the harbor entrance as the Spaniards exited and turned west to run along the coast. By now both sides were firing at each other, the American battleships concentrating on Cervera's flagship the <i>Infanta Maria Teresa</i> . The enemy shells were missing the American ships, but soon the Teresa was in bad shape. Hit repeatedly by 8-inch and 12-inch shells, her wooden decks ablaze, she nevertheless led her battle line out of the harbor and tried to ram the cruiser <i>Brooklyn</i> , Schley's flagship, before turning west.	22

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	The <i>Brooklyn</i> , on Schley's orders, turned sharply away to the east, crossing the bow of the <i>Texas</i> and almost causing a collision. The <i>Brooklyn</i> was then temporarily out of the fighting as she circled to recover her position. The confusion enabled the Spanish to clear the harbor, but soon the faster speed and superior firepower of the American warships made the Spanish ships blazing torches. They turned into the beach, one at a time, to run aground and surrender rather than to sink and lose all hands.	
Battle of Santiago de Cuba	Explain that as the <i>Brooklyn</i> and battleships <i>Texas</i> and <i>Oregon</i> cut down the Spanish cruiser <i>Vizcaya</i> , Captain Philip of the <i>Texas</i> called to his jubilant crew, "Don't cheer, boys, the poor devils are dying." The <i>Oregon</i> overtook the last and fastest Spanish cruiser, <i>Cristóbal Colon</i> , about 70 miles west of Santiago. With 13-inch shells slamming all around, the <i>Colon</i> ran onto the beach and surrendered. The two Spanish destroyers were cut to pieces by the battleship <i>Indiana</i> shortly after they cleared the harbor mouth and before they could fire a single torpedo.	23
Battle of Santiago de Cuba	Explain that Sampson, on the <i>New York</i> , steamed valiantly westward to try to get into the battle but never made it. A bitter dispute later arose between him and Schley over who deserved credit for the victory. Schley was also later roundly criticized for his tardiness in blockading Santiago and his wrong-way turn when Cervera emerged. Explain that the entire action took a little more than three hours. One American was killed and another wounded. Spanish losses were heavy, over 300 killed and 150 wounded, with 1,800 captured, including Admiral Cervera. The Spanish fleet had been annihilated by a superior fleet, despite the latter's tactical errors and surprisingly poor marksmanship	24
Check on Learning Questions A(Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	25
End of the War	Explain that the Battle of Santiago de Cuba had given the American people another Fourth of July victory. In only two months, the U.S. Navy had destroyed the Spanish fleets in both the Pacific and Caribbean. Santiago surrendered its 22,000 troops on 14 July to General Shafter, after a brief siege assisted by long-range naval bombardment. An expeditionary force was sent to Puerto Rico; it quickly overcame all resistance after capturing San Juan, the capital. American arms were victorious everywhere by the end of July, and the U.S. Navy made plans to cruise against the Spanish mainland. Before that happened the Spaniards sued for peace. The two countries signed a peace treaty in Paris on 10 December 1898. Spain recognized the independence of Cuba and turned over Puerto Rico, the Philippines, and Guam to the United States.	26-27
End of the War	Explain that notwithstanding the U.S. success in the war, there were several lessons learned from it. First, the war clearly showed that American military and political leaders had to understand the principles of naval warfare, as elaborated by Mahan. Second, the American people had to understand that to be effective, the Navy had to be a mobile seagoing organization supported from overseas bases. Defense of American cities against attack was not an objective of the Navy. Third, it was clear that a sound amphibious doctrine had to be developed and gunnery and fire control techniques had to be improved. None of the rather disorganized landings in Cuba, Puerto Rico, and the Philippines could have succeeded in the face of serious opposition. Gunnery at Manila Bay and Santiago de Cuba proved effective only against old ships and untrained crews. As Mahan himself warned, "We cannot expect ever again to have an enemy as entirely inept as Spain showed herself to be."	28

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End of the War	Explain that attempts to find solutions to these problems would dominate much of the U.S. Navy's thinking for the next forty years. Most perplexing was the issue of how to defend the Philippines against a militaristic, expansionist Japan. Located some 8,000 miles from the U.S. West Coast and only a few hundred miles from Japan, defense of the Philippine Islands would require naval superiority in Far Eastern waters. This, in turn, would require base facilities in the Pacific far beyond anything the United States had in 1898. Thus, in addition to annexing Hawaii, early in 1899 the United States laid claim to Wake Island, and later the same year it annexed part of the Samoa Islands, including a fine harbor at Pago Pago. In the face of growing anti-imperialist sentiment at home, however, that was as far as Congress could go.	29
End of the War	Explain that Spain, having lost all her principal colonies, decided to divest herself of all her remaining empire and concentrate on domestic development. In 1899 she put up for sale all her remaining Pacific possessions—nearly a thousand islands. The United States was not interested, so Germany acquired many of them, including several located between the United States and the Philippines	30
The Rise to World-Power Status	Explain that the first decade of the twentieth century saw major changes in the world balance of naval power. In the United States, the recent victories over Spain had kindled a national pride in the Navy and helped convince Congress to accept as a national goal the building of a navy that would be second only to that of Great Britain. The chief rivals of Britain and the United States soon became Germany and Japan.	31
The Rise to World-Power Status	Explain that while Mahan had provided the basic philosophy for the American rise to major power status in the years following the turn of the century, the forceful young leader who made it all happen was Theodore Roosevelt. Following the war with Spain, he had returned as a national hero and won the governorship of New York in 1898. Two years later he was selected as President McKinley's vice presidential running mate. When McKinley was assassinated in 1901, Roosevelt assumed the presidency. The brash young proponent of naval power who had done much to get the United States prepared for war with Spain four years earlier as Assistant Secretary of the Navy was now the youngest president in American history. Roosevelt had always been openly enthusiastic about the idea of a large navy. In 1890 he had publicly stated that the United States needed "a large navy, composed not merely of cruisers, but containing also a full proportion of powerful battleships able to meet those of any other nation."	32
The Rise to World-Power Status	Explain that beginning in 1903, the Navy began building two capital ships (large warships) a year, a trend that would continue for about the next fifteen years, through the Roosevelt administration and that of William Howard Taft, who succeeded him from 1909 to 1913. The size of these ships continually increased, both in displacement and armament. In 1905 Congress authorized the battleships <i>Michigan</i> and <i>South Carolina</i> , both of which would have eight 12-inch guns arranged in two pairs of turrets fore and aft.	33
The Rise to World-Power Status	Explain that in 1907 came a warship that would set the standards for all capital ships thereafter: the British battleship <i>Dreadnought</i> . Her main battery (primary armament) consisted of ten 12-inch guns mounted in five turrets, and because the U.S. ships were still on the building ways, this gave her two and a half times the firepower of any other battleship then afloat. She was also the first large ship to be powered by turbine engines, which gave her a maximum speed of 21 knots, faster than any other battleship. The <i>Dreadnought</i> became the type name for all big-gun battleships launched after her, and all the battleships with smaller guns that preceded her came to be called predreadnoughts.	34

Chapter 5 / Section 2: NS2-M1C5S2 – Operations in the Caribbean

The Rise to World-Power Status	Explain that in 1912 the British pioneered the use of oil instead of coal as fuel for large battleships, with the launching of the first battleships of the 27,500-ton <i>Queen Elizabeth</i> class. These developments were soon reflected in subsequent warships built by other world-class navies, including the United States.	35
The Rise to World-Power Status	Explain that advances also were being made in other fields of naval technology. In 1900 Roosevelt urged the Navy to buy its first submarine, the <i>Holland</i> , named after her inventor. Submarines developed rapidly after this, in all of the world's major navies. Roosevelt was also a prime supporter of experiments with manned aircraft, which had begun in 1898, and culminated with the Wright brothers' first successful heavier-than-air flight at Kitty Hawk, North Carolina, in 1903.	36-37
The Rise to World-Power Status	Explain that in 1910 Eugene Ely flew an airplane off a platform built on the bow of the cruiser <i>USS Birmingham</i> . A few months later, he made the world's first arrested shipboard landing in lines strung across the deck of the cruiser <i>Pennsylvania</i> , thus setting the stage for the development of the aircraft carrier.	38
The Rise to World-Power Status	Explain that because of their relatively high standards of living and education, young Americans who enlisted in the Navy soon became very good sailors proficient in the new technology. And since the Navy was doing so many interesting things during these years, enlistment and reenlistment rates were high. By the time World War I broke out in 1914, U.S. naval personnel were among the world's best. Explain that though the American merchant marine could not compete very well in world markets due to wage competition and corporate taxes, the lack of commercial business in the United States had the advantage of keeping American shipyards interested in building quality warships. This produced a whole generation of shipyard constructors who were pretty much warship-building specialists.	39
International Relations	Explain that toward the end of the nineteenth century, Great Britain, traditional enemy of the United States since colonial times, had begun to display a new friendship toward the United States. Britain alone of the major European powers supported American objectives during the Spanish War of 1898. In 1903 the British agreed to a settlement of the Alaskan-Canadian boundary favorable to America. They also conceded exclusive control of the proposed canal across Panama to the United States.	40
International Relations	Explain that the same could not be said of Germany, however. There had been confrontations in Samoa since 1889. The Germans had challenged Commodore Dewey in Manila Bay in 1898 for control of the Philippines and had bombarded the Venezuelan coast to force settlement of international debts in 1902.	41
International Relations	Explain that in 1904 Germany threatened to collect debts in the Dominican Republic by force. In response to this latter action, Roosevelt proclaimed what came to be called the Roosevelt Corollary (extension of a previous doctrine) to the longstanding Monroe Doctrine of 1823, which prohibited foreign interference in the Americas. Roosevelt stated that the United States might feel obligated to intervene in any situation involving wrongdoing by or collapse of government in any Latin American nation to prevent foreign intervention. There followed several such interventions by the United States in various revolution-torn countries in the Caribbean during the following years.	42
International Relations	Explain that in the Pacific region, when the Sino-Japanese War of 1894-95 showed the weakness of the Chinese government, several of the European powers began to move into the region, seeking to establish "spheres of influence" in China backed up by naval squadrons. This caused American merchants to fear that they would lose access to	43

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	Chinese markets, unless the United States would establish a sphere of influence of its own in China.	
International Relations	<p>Explain that the U.S. government, however, was opposed to such a course of imperialist action. A solution was found by Secretary of State John Hay, who in 1899 drafted a paper calling for assurances from each power that China would be open to the trade of all friendly nations, a policy that came to be known as the “open door policy.”</p> <p>Explain that Hay’s policy did not prove to be a final solution, however. To protect their interests, the major powers kept warships in the area, which caused the Chinese to become resentful. In 1900 this led a group of Chinese called Boxers to begin a campaign to rid their nation of foreigners by force. This campaign came to be called the Boxer Rebellion.</p>	44
International Relations	Explain that Russia seized upon the opportunity presented by the Boxers to tighten her grip on Port Arthur, to occupy Manchuria, and to dominate Korea. This in turn led to conflict with the Japanese, and ultimately it led to the Russo-Japanese War of 1904-5. After the Battle of Tsushima Strait, the Japanese government requested that President Roosevelt end the war.	45
International Relations	<p>Explain that though the resulting Treaty of Portsmouth did so in 1905, there was no provision in it for payment of war reparations to Japan, which angered the Japanese and soured relations between them and the United States.</p> <p>Explain that in 1906 the Japanese were further agitated by a new San Francisco School Board policy of segregating the school children of Japanese immigrant laborers who had come into the area following the war with Russia. The situation was soon blown up into a full-scale international incident, and some in Japan threatened to go to war with the United States. The situation was resolved in 1907 only when Roosevelt persuaded the board to rescind its policy.</p> <p>Explain that later in 1907 Roosevelt wanted to impress the Japanese and the other major nations of the world with a demonstration of the sea power behind American diplomacy. Roosevelt had some years earlier expressed his concept of effective diplomacy by quoting an old African proverb: “Speak softly and carry a big stick.” American sea power was Roosevelt’s “big stick.” In December Roosevelt sent sixteen of the most powerful U.S. battleships on a fourteen-month voyage around the world. It was a triumphant cruise of 46,000 miles, with stops in twenty foreign ports, including Japan. Painted white, the fleet was supposed to symbolize peace as well as strength.</p>	46-49
International Relations	Explain that the “Great White Fleet” was a success. The ships performed well, and their crews were excellent ambassadors of good will. The cruise provided good training for the fleet and showed that there was great need for bases and coaling stations in the Pacific. Though the voyage was overshadowed somewhat by the launching of the British <i>Dreadnought</i> battleship, it proudly demonstrated the might of America to the world.	50
International Relations	Explain that the Japanese victory over Russia in 1905, plus the war scare in 1906-7, caused leaders in the Navy to begin to consider Japan a threat against American interests in the western Pacific, especially the Philippines. Accordingly, beginning in 1911 a series of color-coded war plans was developed by Navy and Army planners that would specify American strategy in the event of any future conflict with Japan. Collectively called War Plan Orange, these plans would eventually form the basis of	51

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	U.S. tactics and strategy in the Pacific theater in World War II.	
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	52
Panama Canal	Explain that for over three centuries, Europeans and Americans had talked of a canal across the narrow Isthmus of Panama between the Atlantic and the Pacific. A dangerous journey of thousands of miles around South America would be replaced by a 50-mile trip across the isthmus if a canal could be built.	53
Panama Canal	<p>Explain that the California Gold Rush that began in the 1840s stimulated ideas of a canal again. Many gold seekers sailed to Colon, hiked across the isthmus to Panama City, and picked up a ship for San Francisco. In 1855 Americans built a railroad across the isthmus for shipment of goods between the oceans.</p> <p>Explain that in 1881 a French company headed by Ferdinand de Lesseps, the engineer who had successfully built the Suez Canal, started a Panama canal project. It was a disaster due to financial mismanagement and disease. By 1889 yellow fever and malaria had killed over 22,000 workers, and the project was canceled.</p>	54
Panama Canal	<p>Explain that Mahan revived the idea of the canal in his writings on sea power. He foresaw the need to connect the Atlantic and Pacific so American naval and merchant ships could move quickly between the nation's coasts. The sixty-six-day trip of the battleship <i>Oregon</i> around South America during the Spanish-American War illustrated Mahan's point. It was clear that with new territories in the Pacific, the United States must have either a canal or two separate navies.</p> <p>In 1903 the United States purchased the construction rights, abandoned equipment, and the Panama Railroad from the French company. Now the United States had to secure treaty rights from Colombia. A preliminary treaty was worked out with a Colombian diplomat in Washington. However, the Colombian senate refused to approve the treaty, hoping to hold out for more money.</p>	55
Panama Canal	Explain that Colombia had made a mistake. The people of Panama wanted a canal for jobs. They had repeatedly revolted against Colombia to gain independence over the years, so they were easily convinced by Canal Company agents to revolt again. President Roosevelt, who had counted on the Colombian treaty, was anxious to build the canal. He sent the cruiser <i>USS Nashville</i> to the Panamanian city of Colon, supposedly to maintain "perfect neutrality and free transit" of the isthmus, according to the terms of an 1846 treaty with Colombia.	56
Panama Canal	Explain that within hours, the <i>USS Dixie</i> arrived with a force of U.S. Marines to act as a police force ashore to assist the new government. On 6 November the United States formally recognized the Republic of Panama as a sovereign nation.	57
Panama Canal	Explain that fifteen days after the revolution, a treaty was concluded with Panama, which gave the United States a Canal Zone 10 miles wide "in perpetuity" for \$10 million and a \$250,000 annual payment. The treaty was ratified by the U.S. Senate on 23 November. (The canal was returned by the United States to Panamanian control on 31 December 1999.)	58
Panama Canal	Explain that construction of the canal began in 1904. The U.S. Army Corps of Engineers used all of its technical skill and organizing ability and built the canal in ten years. An	59-62

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	average of 39,000 men worked daily. Building dams, they created Gatun Lake, 85 feet above sea level. By means of three sets of locks, each 1,000 feet long and 110 feet wide, ships are raised to the lake to transit the isthmus and then lowered again to sea level on the other side. The canal was opened on August 1914, just as the First World War began in Europe. The Navy now had its priceless canal. All of Mahan's criteria for America to become a major world power through sea power had been met.	
In Summary	1865 Civil War ends 1873 Naval Institute established 1884 Naval War College established 1890 Mahan publishes Sea Power study 1898 Spanish-American War 1907 HMS <i>Dreadnought</i> launched 1907 Voyage of Great White Fleet 1914 Panama Canal opens	63-64
Review Question	The Review Question is "List 2-3 reasons the <i>Dreadnought</i> became the standard for the modern battleship." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	65
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	66
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	67

III. Supplemental Activities -

A. In Class Activity: Supplies required: Whiteboard MOBI

When: This is a good activity to do after CPS questions 5 and 6 prior to the slides on the Panama Canal.

- Class question: How do you raise it up a ship 85ft and then lower it back down? Is sea level the same on both sides of the Panama Canal? Which side is higher? (Pacific)
- Watch the following video of the *USS RINTZ* transiting the canal.
<https://www.youtube.com/watch?v=kWu4MjGYsr4>

B. Take Home Activity: How did the completion of the Panama Canal change the way the Nation and the Navy plan their fleets? Using the handout, "Panama Canal", Make a list of 7 advantages to having the Panama Canal and give reasons for why you feel they are advantages.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 5 / Section 2: NS2-M1C5S2 – Operations in the Caribbean

Activity 1: Take Home Activity- Panama Canal

Name: _____ Date: _____ Class: _____

Directions: How did the completion of the Panama Canal change the way the Nation and the Navy plan their fleets? Make a list of 7 advantages to having the Panama Canal and give reasons for why you feel they are advantages.

1.

2.

3.

4.

5.

6.

7.

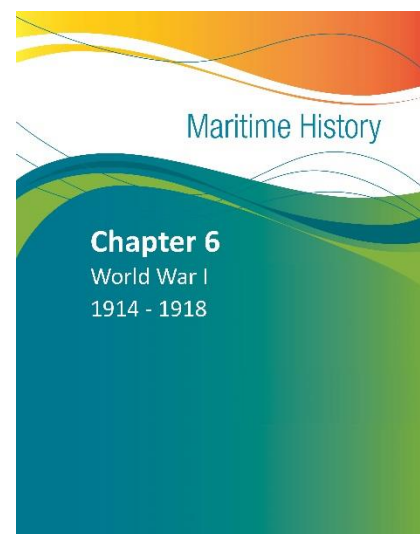
Module 1 Chapter 6: NS2M1C6 – World War I, 1914 - 1918

What Students Will Learn to Do:

Demonstrate knowledge of the Navy's role from World War I, 1914 – 1918

Skills and Knowledge to be Gained:

1. Recognize the Triple Entente and Central Powers
2. Explain the war plans made by Great Britain and Germany during World War I
3. Describe actions taken by the German and the British during the Pacific Action
4. Explain the significance of the battles of Jutland and Gallipoli during World War I
5. Explain the operational advantages of the German U-boats over the Allies during World War I
6. Explain the events that brought America into World War I
7. Explain the operation and significance of the convoy system that was used by Great Britain during World War I
8. Describe the antisubmarine operations used by the U.S. Navy during World War I
9. Describe the role America played during World War I
10. Briefly describe events leading up to the surrender of Germany



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.3. Analyze how the author unfolds an analysis or series of ideas or events...

Writing

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

Module 1 Chapter 6: NS2M1C6 – World War I, 1914 - 1918

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place, as well as broader historical contexts.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

Chapter 6 / Section 1: NS2-M1C6S1 –World War I

(Section 1 of 2)

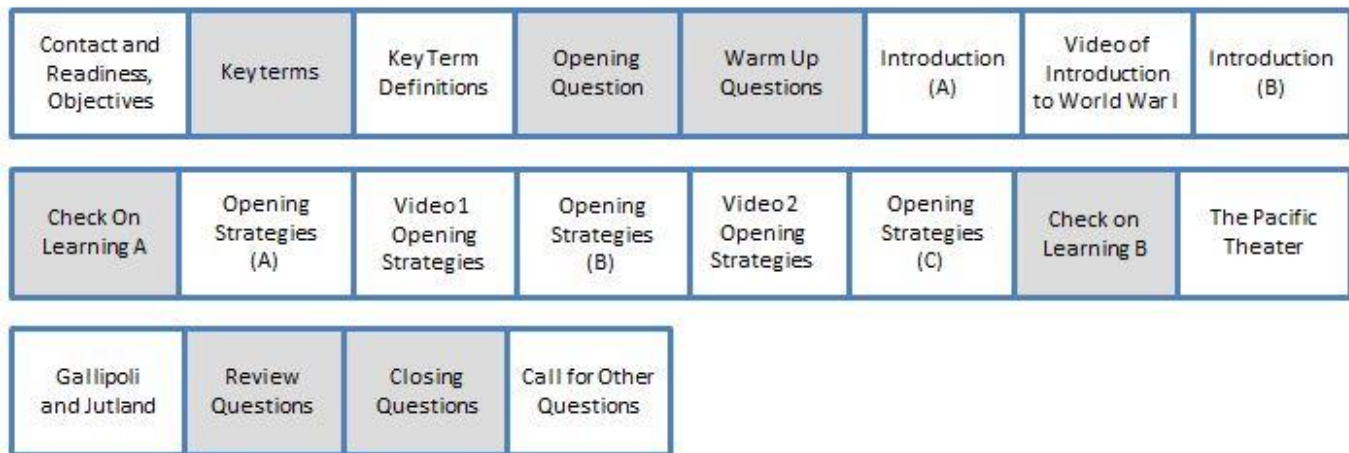
What Students Will Learn to Do:

Demonstrate knowledge of the Navy's role from World War I, 1914 – 1918

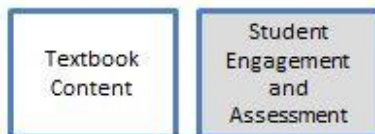
Skills and Knowledge to be Gained:

1. Recognize the Triple Entente and Central Powers
2. Explain the war plans made by Great Britain and Germany during World War I
3. Describe actions taken by the German and the British during the Pacific Action
4. Explain the significance of the battles of Jutland and Gallipoli during World War I

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 6. Place a checkmark beside the NS2-M1C6S1 PowerPoint presentation, and these two CPS question deck files: NS2-M1C6S1 - Key Terms and NS2-M1C6S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 6 / Section 1: NS2-M1C6S1 –World War I

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will discuss the British and German operations in World War I and the influence of technology in turning the war to Allied victory. We will look at the War in Europe, war planning, the amphibious invasion of the Gallipoli Peninsula of Turkey and the great naval Battle of Jutland.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “What do you think was the cause of World War I?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on World War I.	6
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	7
Introduction	Explain that the late 1800s and early 1900s were characterized by increasingly aggressive competition among the world’s major powers for control of world resources and for economic, military, and political power. The naval building races that had begun between the European powers in the West and between Russia, China, and Japan in the East were one aspect of this competition. The United States came late to this naval building program, and it took part primarily because it was required as a condition of its rise to world power status.	8-10
Introduction	Explain that in the Taft administration from 1909 to 1913, and even more in the early years of the Wilson administration that followed, the main focus of the United States was turned inward toward domestic reforms. The era was marked by a movement called progressivism, which focused on individual rights, engaging in antitrust legislation against big business, banking reform, conservation of natural resources, and nonintervention in the affairs of Europe unless U.S. interests were directly threatened.	11-12
Introduction	Explain that meanwhile, the European powers were engaged in a series of actions that would eventually lead to war in 1914. Since the late 1800s imperialism had been rampant in both Europe and the Far East. The Far East Diplomacy in Europe had been overtaken by militarism. This meant that the primary political preoccupation in the major nations was preparation for war rather than domestic programs.	13-15

Chapter 6 / Section 1: NS2-M1C6S1 –World War I

Introduction	Explain that in countries with diverse populations, a series of nationalistic movements began to take place among ethnic minorities longing for independence. Finally, a series of entangling alliances arose. These alliances were designed to enhance the security of the participating nations. Since the alliances made it mandatory for the major powers to defend one another in the event of attack by an opposition power, the alliances made war more likely.	16
Introduction	Explain the European powers competed with one another for colonies in Africa and the Pacific region. Meanwhile, Japan acquired Korea, Taiwan, and territory on the Chinese mainland as a result of its victories over China in 1895 and Russia in 1905.	17
Introduction	Explain that the assassination of Archduke Ferdinand resulted in the immediate start of World War I.	18
Video of Introduction to World War I	Show video of Introduction to World War I	19
Introduction	Explain that Europe went to war on 28 July 1914 when Austria-Hungary declared war on Serbia. Within one week, all major powers of Europe had been drawn into war due to the various interlocking defense treaties. On one side was the Triple Entente, consisting of France, Britain, Russia, and Serbia (referred to as the Allies). On the other side were the Central Powers, Germany and Austria-Hungary. At the end of 1914, the Ottoman Empire (modern-day Turkey) entered the war on the side of the Central Powers. In 1915, Italy joined the Allies. By war's end, most North African nations followed suit. Although most Americans supported the British and French, President Wilson wanted to maintain US neutrality.	20-23
Check on Learning Questions A(Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	24
Opening Strategies	Explain that at sea, the two main enemies were the British home fleets and the German High Seas Fleet. The British had two home fleets- the Grand Fleet based at Scapa Flow in the Orkney Islands of Scotland and the Channel Fleet.	25
Opening Strategies	Explain that the mission of the twenty-four front-line battleships and battle cruisers of the Grand Fleet was to prevent the escape of German ships into the Atlantic, to guard the North Sea, and to engage and destroy the German High Seas Fleet in battle. The main task of the Channel Fleet, with seventeen second-line battleships, was to keep the English Channel safe for passage of British troops and supplies to France.	26-27
Video 1 on Opening Strategies	Show video 1 on opening strategies	28
Opening Strategies	Explain that the German fleet was based in the estuaries of the Weser and Elbe Rivers. The responsibility of the fleet was to guard the German coast from British attack and defeat units of the British fleet whenever possible.	29
Opening Strategies	Explain that the Central Powers occupied the interior land position. They had an excellent railroad system to shift forces quickly to either the western front in France or the eastern front in Russia. They controlled the central agricultural areas of Europe. In contrast, the Allies were geographically separated and they lacked adequate communications. Thus, Germany had a geographical advantage in the land struggle but was at a disadvantage at sea. Its ships would have to go through the North Sea to get into the Atlantic and this would be difficult in the face of the British fleet at Scapa Flow.	30

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Opening Strategies	Explain that Britain, on the other hand, was completely dependent on imported foodstuffs for survival. She could, however, call on nearly half the world's merchant shipping and economic resources in every corner of the globe—so long as she controlled the oceans. At the outbreak of war, the Germans intended to quickly defeat France on land, hold Russia at bay, and keep their High Seas Fleet intact as a bargaining chip at a peace conference. Meanwhile, they also planned to damage the British merchant and naval fleets with far-ranging cruisers and raiders and to whittle down the strength of the home fleets in small actions.	31-32
Opening Strategies	Explain that in Britain there were two conflicting ideas on how to fight the war. One group wanted a peripheral strategy, depending mainly on the Navy to blockade Germany and gradually weaken the German ability to fight by a series of amphibious operations. The continental Allied powers would carry the war to Germany on land. The other group wanted to place the main British army on the continent to assist France and drive toward the heart of Germany. The latter group won out. During the first months of the war, Britain was able to transport a quarter of a million troops across the channel into France because of her control of the English Channel.	33-34
Video 2 on Opening Strategies	Show video 2 on opening strategies	35
Opening Strategies	Explain that these troops were a key factor in helping to stop the first German offensive across Belgium toward Paris in September 1914. Thereafter both sides consolidated their positions and constructed miles of soggy, rat-infested trenches, from which the two sides faced each other across an empty no-man's-land stretching 350 miles across Europe. Periodically each side tested the other's lines by charging against them, only to be cut down by machine guns, a newly developed weapon. This condition of stalemate lasted for months, and the loss of life on both sides was appalling.	36-37
Opening Strategies	Explain that in the North Sea, meanwhile, the British and German navies fought several times, with the British victorious every time. After January 1915 the German surface forces mostly retired to port behind protective mine fields, where they stayed for most of the rest of the war.	38
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	39
The Pacific Theater	Explain that in 1898 Germany had acquired a naval base at Tsingtao, China, and had purchased many other Pacific islands from Spain in the years following. These were developed into coaling stations and colonies. Thus, when war broke out in 1914, half a dozen German cruisers were operating in the Pacific under Vice Admiral Graf von Spee. Japan had been resentful of the German presence in the region ever since Germany had been instrumental in forcing Japan out of Port Arthur at the end of the Sino-Japanese War.	40
The Pacific Theater	Explain that Japan had signed an alliance with Britain in 1902. Hence, when war was declared in 1914, Japan cited the alliance and demanded the withdrawal of German warships from China and Japan and the surrender of Tsingtao. Explain that when war broke out Von Spee was at Ponape in the Caroline Islands with four of his cruisers. Von Spee reasoned that if he lingered in the western Pacific he would eventually be hunted down, so he decided to proceed to the west coast of South America, where he could get support from friendly Chile. On the way he picked up two more cruisers at Easter Island. He arrived off Chile in October 1914.	41

Chapter 6 / Section 1: NS2-M1C6S1 –World War I

The Pacific Theater	<p>Explain that the British had a force of cruisers operating off the coast of Brazil, home-ported at the British colony of Port Stanley in the Falkland Islands. Several of these sailed around the cape and engaged the Germans off Coronel, Chile, in November but were driven off with two cruisers sunk. Von Spee then decided to proceed around the cape to Port Stanley in December, hoping to capture the base and its coal supplies. The British, however, had sent two additional cruisers to the Falklands to join six others already there, so when von Spee arrived on 8 December, he found himself outnumbered.</p> <p>Explain that he tried to flee back west, but was overtaken and his ships were cut to pieces by the superior British force. This battle eliminated the last major German surface forces outside the North Sea.</p>	42
Gallipoli and Jutland	<p>Explain that In late 1914, the British concluded that if they could capture Constantinople, the Allies could not only support Russia on the Eastern Front, but also open up another front on the Balkan Peninsula which would in turn cause the Germans to divert troops and efforts.</p> <p>Explain that accordingly, but only after much delay, which allowed the Turkish defenders to reinforce and secure their positions, an amphibious assault was launched against Gallipoli in late April 1915. Because of a lack of experience, poor reconnaissance and bad planning, a lack of coordination, and ineffective naval gunfire support, the landings did not go well. Still, a sizable number of Allied troops were eventually landed. However, they were soon deadlocked in position by an equal number of Turks under the aggressive command of Mustafa Kemal, who eight years later would found the Turkish Republic. The stalemate continued until November 1915, when it became obvious that the campaign would not succeed.</p>	43-45
Gallipoli and Jutland	Explain that the Allied forces then began to withdraw, completing this operation by January 1916. Their successful withdrawal under fire is still considered to be one of the most remarkable amphibious evacuations in the history of modern warfare. As a result of the failed Gallipoli campaign, Bulgaria joined the Central Powers and helped Germany conquer all of the Balkan countries.	46-47
Gallipoli and Jutland	Explain that in January 1916 a new, more aggressive admiral was given command of the German High Seas Fleet: Vice Admiral Reinhard Scheer. He was determined to do selective battle with the British fleet in order to reduce its numbers and perhaps win control of the North Sea. Accordingly, in May the fleet sortied from its base at Jade Bay and proceeded toward the coast of southern Norway opposite Denmark's Jutland Peninsula to raid Allied shipping there. Altogether there were some 100 German ships, including 16 dreadnought and 6 predreadnought battleships and a number of cruisers and destroyers in scouting positions. Unknown to the German commander, however, the British Grand Fleet had sailed for the same area the day before from its bases at Scapa Flow and the Scottish firths (openings of rivers into the sea). The Royal Navy had earlier broken the German naval code and had gathered radio intelligence informing of the German plans. Under the command of British Admiral Sir John Jellicoe were about 150 ships, including 28 dreadnoughts and several squadrons of cruisers and destroyers.	48-49
Gallipoli and Jutland	Explain that first contact was made at about 1530 the afternoon of 31 May between opposing cruiser forces. Within minutes, two British cruisers had been sunk by German cruisers, which were superior in armor and armament. At about 1650, a division of four British dreadnoughts came into range with the German main body and began a running battle to the north, with Jellicoe's main body of twenty-four battleships proceeding to join the action from the northwest. About 1800 a long column of Jellicoe's battleships succeeded in "capping the T" on Scheer's force. (Capping the T is	50

Chapter 6 / Section 1: NS2-M1C6S1 –World War I

	a classic naval tactic. A commander attempts to maneuver his column of warships into position at the head of a T with an enemy column moving up the stem of the T. This gives his ships full broadside capability against the enemy ships while the enemy ships can bring only their forward guns to bear.) Before they could do much damage, Scheer turned away to disengage. Jellicoe refused to follow, fearing that his force might be led into minefields or waiting submarines.	
Gallipoli and Jutland	Explain that the Germans were pleased by their victory against the world's most powerful navy. After Jutland, however, they did not want to risk their High Seas Fleet again, so it mostly stayed in port for the rest of the war. Gradually many of the fleet's personnel were transferred to the submarine force, which caused a severe loss of morale within the German Navy. This in turn would ultimately contribute to the collapse of its fighting forces two years later. The Battle of Jutland was the final great action to be fought between surface forces in the Age of Steam.	51
Gallipoli and Jutland	Explain that in America, the Battle of Jutland shocked the Wilson administration. It demonstrated that the British fleet was not supreme, and that the United States might yet find itself facing Germany on the high seas without British protection. In response to the battle, plus a new threat of German U-boat warfare, in August 1916 a large new naval building program was rushed through Congress. Ten battleships, six battle cruisers, ten scout cruisers, fifty destroyers, and sixty-seven submarines were to be built within the next three years	52
Review Question	The Review Question is "List 2-3 reasons that the U.S. embarked on a major ship-building effort in 1916." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	53
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	54
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	55

Chapter 6 / Section 1: NS2-M1C6S1 –World War I

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handouts for in class and Take home activities

When: This activity should be handed out at the beginning of this section and concluded at the end of section 2 (Undersea Warfare).

- During the next two sessions, have the Cadets create a timeline of significant events from the start of WWI to its end. Place a numerical ID (1,2,3...) for each event on the line below.

B. Take Home Activity: Have the cadets use the handout “take home activity – WWI Introduction” and have them list the characteristics and systems of the following WWI United States Naval Ships:

Battleships • Battle Cruisers • Scout Cruisers • Destroyers • Submarines

IV. Evaluation - see CPS database for chapter test questions.

Chapter 6 / Section 1: NS2-M1C6S1 –World War I

Activity 1: In Class Activity – WWI Introduction

Name: _____ Date: _____ Class: _____

During the next two sessions, create a timeline of significant events from the start of WWI to its end.
Place a numerical ID (1, 2, 3 ...) for each event on the line below.



ID	Date	Description of Event

Chapter 6 / Section 1: NS2-M1C6S1 –World War I

Activity1: At Home Activity – WWI Introduction

Name: _____ Date: _____ Class: _____

Directions: List the characteristics and systems of the following WWI United States Naval Ships.

Ship Type	Specifications (length, width, crew, armament, weapons....)
Battleships	
Battle Cruisers	
Scout Cruisers	
Destroyers	
Submarines	

Chapter 6 / Section 2: NS2-M1C6S2 – Undersea Warfare

(Section 2 of 2)

What Students Will Learn to Do:

Demonstrate knowledge of the Navy's role from World War I, 1914 – 1918

Skills and Knowledge to be Gained:

1. Explain the operational advantages of the German U-boats over the Allies during World War I
2. Explain the events that brought America into World War I
3. Explain the operation and significance of the convoy system that was used by Great Britain during World War I
4. Describe the anti-submarine operations used by the U.S. Navy during World War I
5. Describe the role America played during World War I
6. Briefly describe events leading up to the surrender of Germany

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Undersea Warfare (A)	Video on Undersea Warfare	Undersea Warfare (B)
America Declares War	Check On Learning A	Convoy System (A)	Video Convoy System	Convoy System (B)	Antisubmarine Operations	Check on Learning B	America's Role
Allied Victory (A)	Video 1 Allied Victory	Allied Victory (B)	Video 2 Allied Victory	In Summary	Review Questions	Closing Questions	Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 6 / Section 2: NS2-M1C6S2 – Undersea Warfare

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 6. Place a checkmark beside the NS2-M1C6S2 PowerPoint presentation, and these two CPS question deck files: NS2-M1C6S2 - Key Terms and NS2-M1C6S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will learn that America had assumed a neutral position in the war, but the Battle of Jutland shocked American naval and government leaders into action. Submarine warfare played a great part in World War I. This role led to the development of several new weapons used in antisubmarine operations. We will talk about how this led to even greater technology. We will also discuss America's involvement in World War I after their reluctant entry into the war. We will finish by briefly describing events leading up to the surrender of Germany</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-9
Opening Question(Random Pick a Student – "RPS")	<p>This Opening Question is "Discuss how Americans in general might have been feeling about the war at this point in history." Since this is a discussion question, it can be engaged using the RPS, where CPS will display one student's name or clicker number, chosen randomly. The student selected will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on undersea warfare in World War I.</p>	10
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	11

Chapter 6 / Section 2: NS2-M1C6S2 – Undersea Warfare

Undersea Warfare	Explain that when war broke out in August 1914, Britain imposed a blockade against Germany, hoping that this would deny vital foodstuffs and raw materials. The blockade did not seriously hurt Germany at first because of previously stockpiled materials, development of substitutes, and imports from neutral countries by way of the Baltic Sea. In response, in February 1915, Germany declared the waters around Britain and Ireland a war zone and warned that both Allied and neutral ships in the war zone would from that time on be subject to attack by submarines and surface ships.	12-13
Undersea Warfare	Explain that the German surface raiders were kept at bay by the British home fleets, but not so the German submarines, or U-boats, as they were called. Beginning in February the U-boats sank an average of almost two ships per day. In May the U-20 sank the British passenger liner <i>Lusitania</i> off the south coast of Ireland. Among the dead were 128 U.S. citizens. (Besides passengers, the ship was later determined to have been carrying war supplies to England.)	14-15
Video on Undersea Warfare	Show video on undersea warfare	16
Undersea Warfare	Explain that Americans at home were outraged, but as Germany had calculated, the United States was not ready to go to war. President Wilson urged patience, and he demanded that Germany stop its unrestricted submarine warfare. In August, a British passenger steamer was sunk with the loss of three American lives. This brought U.S. protests to the point of threatening war. In response, the German Kaiser proclaimed that no more passenger liners would be attacked. This ended the first phase of U-boat warfare in the North Sea.	17
Undersea Warfare	Explain that for the rest of the year the Germans shifted the focus of U-boat warfare to the Mediterranean, where more than 100 Allied ships were sunk by year's end. Explain that early in 1916 the German general staff thought that the United States had become more knowledgeable about German submarine warfare, and they resumed attacks in the British Isles area. In March, the unarmed French steamer <i>Sussex</i> was sunk in the English Channel by a U-boat that mistook her for a warship. Casualties included three wounded Americans. This led President Wilson to threaten to break diplomatic relations with Germany.	18
Undersea Warfare	Explain that the German government replied with the "Sussex Pledge," promising that henceforth international law would be followed. This required that notice be given and provisions be made for the safety of passengers and crew before a noncombatant ship could be torpedoed.	19
Undersea Warfare	Explain that by late 1916, the German general staff had begun to realize that Germany was losing the war simply because it had not yet won it. Time was on the side of the Allies. Germany could not continue the stalemate because the British blockade was beginning to have an effect on the country. The U-boat offered the only hope of immediate victory. A study by the Chief of the German Naval Staff concluded that if major, unrestricted submarine warfare were initiated by February 1917, Britain would be starved into submission by June, before the summer harvest.	20
Undersea Warfare	Explain that the Germans calculated that even if American aid were started, it would be too late to do any good. The Germans believed the Allies would not initiate convoys. They assumed Allied antisubmarine tactics would not be successful in combating the large number of improved German U-boats. They were to be proven wrong on each of these assumptions.	21

Chapter 6 / Section 2: NS2-M1C6S2 – Undersea Warfare

Undersea Warfare	Explain that on 1 February 1917, the Kaiser ordered his U-boat fleet to begin unrestricted submarine warfare in designated “barred zones” in the eastern Mediterranean and around Britain, France, and Italy. Any Allied or neutral ships found in these areas were liable to be sunk without warning. By the end of April, the Germans had sunk over 2 million tons of shipping, exceeding even their own estimates. Britain’s economy and war industry were severely damaged. It quickly became clear that if the attacks and sinking of ships continued at this rate, Britain would soon have to surrender.	22-23
America Declares War	Explain that top American naval officers had been strongly recommending that the Navy prepare for war since the beginning of the European war. However, there was powerful political opposition to this from Secretary of the Navy Josephus Daniels and from Congress.	24
America Declares War	Explain that with Wilson’s approval, Secretary Daniels had refrained from making any war preparations during Wilson’s first term in office, concentrating instead on in-house reforms. In 1916 President Wilson had been reelected on an isolationist platform. They felt that any buildup of a military fleet would be contrary to the pledge to stay out of the war. The shipbuilding program authorized in 1916 was plodding along with no sense of urgency, according to the direction of President Wilson and Daniels. The Navy was especially weak in destroyers and other small anti-submarine patrol craft. However, under the circumstances, the battleship fleet was adequate.	25
America Declares War	Explain that American public opinion had swung strongly to the side of the Allies by the end of 1916, primarily due to German U-boat warfare and American civilian casualties. When Germany proclaimed its policy of unrestricted submarine warfare in February 1917, President Wilson severed diplomatic relations and ordered American merchantmen bound for the war zone to be armed.	26-27
America Declares War	Explain that in early March, British intelligence intercepted a secret note from Germany to Mexico. In it, Germany’s foreign secretary, Arthur Zimmermann, tried to convince Mexico to join Germany in the event of war with the United States. In return, Germany would help Mexico recover land it had relinquished to the United States after the Mexican War. This land comprised the states of Texas, Arizona, and New Mexico. When the British revealed the contents of this note to the U.S. government, it caused an uproar. All remaining support for the German cause in Washington evaporated, even among those who had strongly supported neutrality. In late March, four American merchant ships were sunk by U-boats without warning off the British Isles. Wilson hesitated no longer.	28-30
America Declares War	Explain that on 2 April he sent his war message to Congress, stating, “The world must be made safe for democracy. . . . The right is more precious than peace.” On 6 April, Congress declared war on Germany.	31
Check on Learning Questions A (Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	32
Convoy System	Explain that shortly before war was declared, President Wilson had sent Rear Admiral William Sims to London to confer with the British. The ship on which Sims was traveling struck a German mine near Liverpool. Sims came ashore among the survivors. He proceeded to London, arriving a few days after the American declaration of war. He immediately went into consultation with Admiral Sir John Jellicoe, the first Sea Lord. Sims learned that Britain was losing the war and would need to surrender by October if the U-boat sinking could not be stopped.	33

Chapter 6 / Section 2: NS2-M1C6S2 – Undersea Warfare

Video on Convoy System	Show video on convoy systems	34
Convoy System	Explain that Sims was very surprised that the British had not started a convoy system to protect merchant shipping. This method of grouping merchantmen under destroyer escort had proven successful across the English Channel. British Admirals believed it unwise to bunch merchant ships at sea, fearing collisions and claimed that destroyers should not be used for such a “defensive” role. A group of younger British naval officers, however, had wanted to try the convoy. Sims conferred with them and was convinced that the convoy concept would work. He went directly to the British Prime Minister, David Lloyd George, and strongly recommended that the convoy strategy be tried. The Prime Minister agreed and directed the Admiralty to try it out.	35
Convoy System	Explain that in the meantime, Sims cabled President Wilson to send every destroyer possible to Britain to help in anti-submarine warfare. The first destroyers arrived in May. By July, thirty-seven American destroyers were in Britain assigned to anti-submarine work, mostly escorting convoys under British command.	36
Convoy System	Explain that Sims was appointed Commander, United States Naval Forces Operating in European Waters. He concentrated on all aspects of anti-submarine warfare. Sims had to convince the top officers in the U.S. Navy, and Josephus Daniels as well, about the value of the convoy. While the British started convoys on 30 April at Sims’s urging, it took the U.S. Navy until July before accepting the idea. By that time, the success of the convoy system had been proved in actual operations. Escorts of convoys sank more U-boats than ever before, convoys sailed without collisions, and port schedules were greatly improved. Convoys could sail on direct routes, not having to zigzag to avoid U-boats. This saved both time and fuel. From May onward, losses dropped steadily. Adoption of the convoy system was a key factor in saving Britain from defeat in World War.	37
Antisubmarine Operations	Explain that no one single method of warfare, however, could defeat the U-boats. In addition to the convoy, the following methods were used to finally bring the menace under control:	38
Antisubmarine Operations	Explain that the destroyer came to be the main surface vessel designed for combating the submarine. Along with its guns and torpedoes, the destroyers also carried a new weapon called the depth charge. Designed by the British in the earlier part of the war, depth charges were canisters of TNT fitted with a device that would detonate at a preset depth.	39
Antisubmarine Operations	Explain that these could be rolled off the stern from racks or fired from simple launchers called “Y guns,” so named because of their shape. By 1918 destroyers carried from thirty to forty depth charges, each containing 300 pounds of TNT. The United States built 273 destroyers during and immediately after the war.	40
Antisubmarine Operations	Explain that another ship designed by the U.S. Navy especially for anti-submarine warfare was the submarine chaser. This was a wooden vessel 110 feet long. ‘Sub-chaser’ patrols were established in the North Sea, and across the southern end of the Adriatic Sea in the Mediterranean to bottle up Austrian submarines. Nearly 400 of these little ships were built, and they were very effective in convoying and other anti-submarine functions.	41
Antisubmarine Operations	Explain that it was not enough just to escort and patrol against lurking submarines. Locating the submarine under the water was the key to destroying it. In 1915 the hydrophone was invented. This device could pick up underwater noises and indicate bearing but not range. If two or three ships, each with a hydrophone, found a	42-43

Chapter 6 / Section 2: NS2-M1C6S2 – Undersea Warfare

	submarine, however, they could determine by cross bearings almost exactly where the submarine was located, drop depth charges, and destroy the enemy. The sub-chasers were fitted with hydrophones in 1917 and proved to be even better equipped to hunt the U-boats than were the destroyers. When three ships worked together in this manner, the system was called triangulation. This was the beginning of what is now called sonar, that is, underwater sound equipment.	
Antisubmarine Operations	Explain that the blockade of German submarine bases with surface ships did not prove to be very effective. As a result, the Allies laid gigantic minefields to prevent U-boats from getting into the Atlantic. One of these minefields was laid across the Dover Strait, from England to Belgium. Because this field could be patrolled against German minesweepers, it proved to be the most effective. The Dover Strait Barrage destroyed at least twelve U-boats and completely closed the strait to German submarine traffic.	44
Antisubmarine Operations	Explain that the largest minefield was the North Sea Mine Barrage, which ran from Scotland almost to the Norwegian coast. The laying of this minefield presented great problems, all of which were overcome with special equipment and hard work. When finished, the field had seventy thousand, two hundred mines. Fifty six thousand, six hundred of the mines were laid by the U.S. Navy. There is no positive information available on the effectiveness of the field. It is believed that at least one submarine was sunk and a number of others damaged.	45
Antisubmarine Operations	Explain that a minefield, is often far more dangerous in the minds of those who must try to cross it than in actuality. The number of U-boats refusing to make the trip through the minefield is unknown. It is documented that morale among the submariners was falling fast at this time, partly because of the minefields. It was the German submarine force that led the mutinies undermining the entire German fleet as the war neared its end.	46
Antisubmarine Operations	Explain that air operations had been carried out with little success by the British against submarines since early in the war. With the advent of the convoy, careful coordination of air patrols with convoy schedules began to have a positive effect. The early airplanes flying these missions had no effective weapons to sink submarines, but they did attack and damage a number of them. This served to discourage the U-boats. Improved weapons and detection methods would make the airplane an important anti-submarine weapon during World War II.	47
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	48
America's Role	Explain that the U.S. Navy did not take part in the dramatic surface warfare actions that had occurred in the early years of the war. Our Navy's role after the American entrance into the war was mainly to patrol and convoy the huge numbers of troops and enormous amounts of supplies needed by the ground forces on the western front. By midsummer 1917, just a few months after the United States entered the war, 50,000 troops per month were crossing to France. A year later, 200,000 were crossing each month. All told, over 2 million Americans crossed the Atlantic to the war zone, and not a single troop ship or soldier was lost to the German U-boats.	49-50
America's Role	Explain that on land, these American forces were vital in stopping major German offensives against the Allies in early 1918, and again in July 1918, during the Second Battle of the Marne. American forces, including over 25,000 marines, bore some of the heaviest fighting at Château-Thierry, Belleau Wood, and the Meuse-Argonne fronts and succeeded in causing the Germans to fall back. During the first Allied offensive in late summer 1918, large-caliber naval guns mounted on railway flatcars helped	51-53

Chapter 6 / Section 2: NS2-M1C6S2 – Undersea Warfare

	destroy German railroads, bridges, and ammunition dumps.	
America’s Role	Explain that the American shipbuilding industry built several thousand merchant ships to carry supplies and war material to England and France. These supplies, along with the manpower and the highly successful convoy system of the U.S. Navy, were essential in helping the Allies to victory.	54
Allied Victory	Explain that fortunately for the Allies, the Americans had entered the war at a decisive time. Russia had surrendered to the Germans in late 1917 after the Russian Revolution and terrible defeats on the eastern front. This released large numbers of German troops to the western front, where they outnumbered the Allies for the first time since 1914. New tactics and equipment—aircraft, tanks, and mobile artillery—had been adopted by the Germans. The Americans arrived just in time to help stop these fierce drives.	55-57
Video 1 on Allied Victory	Show video 1 on allied victory	58
Allied Victory	Explain that Germany could not keep up its last offensives. Germany had temporarily avoided starvation with the capture of Romania and the Russian Ukraine in early 1916, but the British blockade gradually caused widespread famine and shortages of war material. By October 1918, its submarines were defeated and the Allies were advancing rapidly toward Germany. Its High Seas Fleet began to mutiny because ships could not sortie without heading into certain death. The convoy system had not only destroyed the U-boats, it had also made the Allies overwhelmingly powerful on the sea and in the field. The German people were starving and near revolution. On 9 November, 1918, Kaiser Wilhelm II abdicated and fled to Holland in exile. Two days later, on the eleventh hour of the eleventh day of the eleventh month, Germany surrendered to the Allies in a railway car near Paris.	59-60
Video 2 on Allied Victory	Show video 2 on allied victory	61
In Summary	<div><div>28 July1914</div><div>World War I begins</div></div> <div><div>8 Dec. 1914</div><div>Von Spee defeated at Falklands</div></div> <div><div>25 Apr. 1915</div><div>Gallipoli assault</div></div> <div><div>7 May1915</div><div>Lusitania sunk by U-boat</div></div> <div><div>31 May 1916</div><div>Battle of Jutland</div></div> <div><div>1 Feb. 1917</div><div>Germany begins unrestricted submarine warfare</div></div> <div><div>6 Apr. 1917</div><div>America declares war on Germany</div></div> <div><div>July1917</div><div>Convoying begins to Europe; American troops arrive</div></div> <div><div>3 Mar. 1918</div><div>Russia signs nonaggression treaty with Germany</div></div> <div><div>11 Nov. 1918</div><div>Germany surrenders</div></div>	62-63
Review Question	The Review Question is, “Discuss how the Allied forces fought against the German U-boats.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	64
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	65

Chapter 6 / Section 2: NS2-M1C6S2 – Undersea Warfare

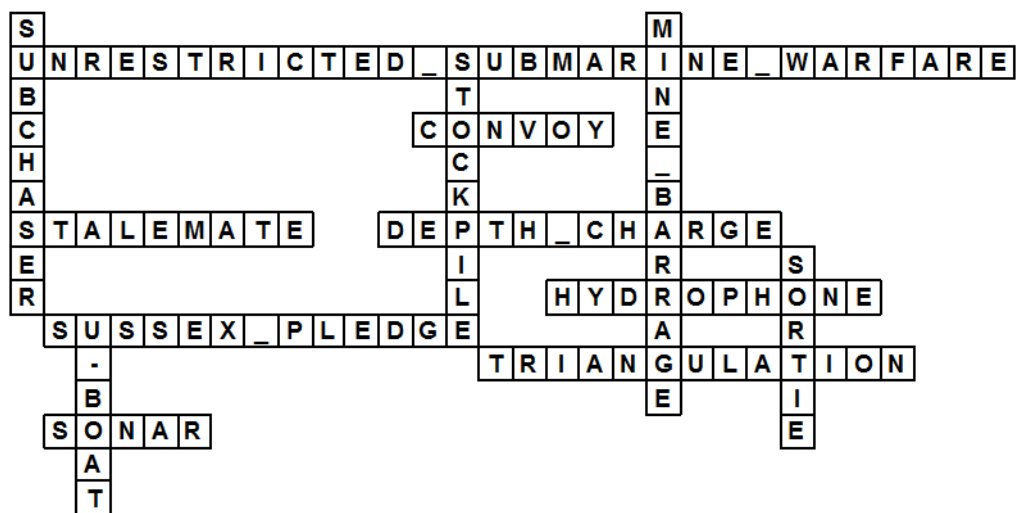
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	66
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III. Supplemental Activities -

A. In Class Activity: Have the cadets continue the section 1 timeline activity of significant events from the start of WWI to the end.

B. Take Home Activity: Have the cadets complete the crossword puzzle handout containing key terms from the lesson. There are multiple words that have a dash separating words.

Solution:



IV. Evaluation - see CPS database for chapter test questions.

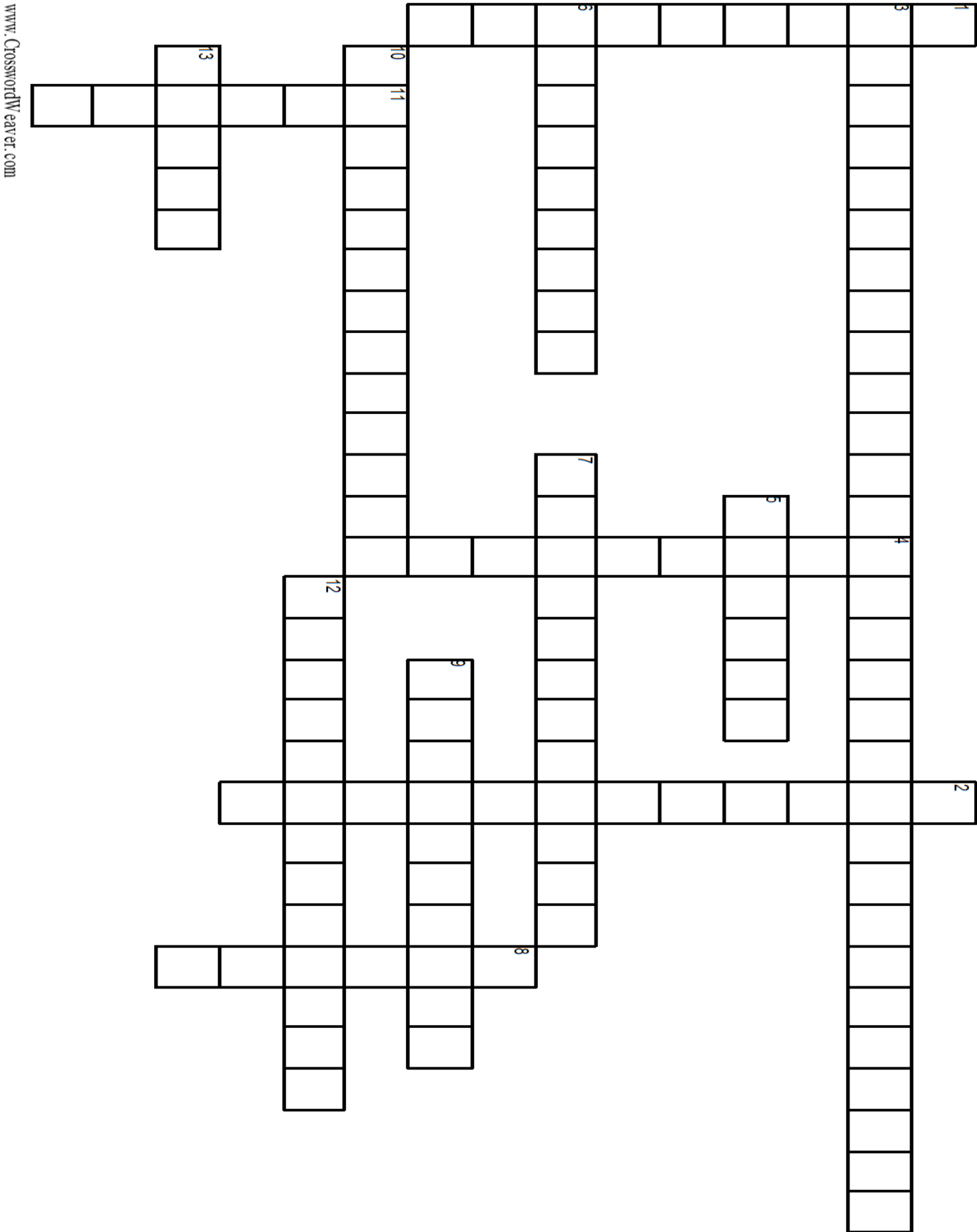
Chapter 6 / Section 2: NS2-M1C6S2 – Undersea Warfare

Activity1: Take Home Activity – WWI Undersea Warfare

Name: _____ Date: _____ Class: _____

Directions: Fill the blank crossword puzzle with key terms from this lesson using the clues below. Multiple word answers have a dash separating words.

ACROSS	DOWN
3. A tactic used by German U-boats whereby any naval target of any other country could be attacked.	1. A small and fast naval vessel, specifically intended for anti-submarine warfare.
5. A group of vehicles, typically motor vehicles or ships, traveling together for mutual support and protection.	2. A heavy concentration of mines used to protect one's own ships or to stop the advance of enemy ships.
6. Any position or situation in which no action can be taken or progress made; deadlock; to bring to a standstill.	4. A large supply of some material (metal, chemical, food, etc.) gathered and held in reserve for use during a shortage or during a period of higher prices; A quantity as of munitions or weapons, accumulated for possible future use.
7. A charge designed for detonation at a preset depth under water, specifically against submarines.	
9. A device for locating sources of sound under water, as for detecting submarines by the noise of their engines.	8. A rapid movement of troops from a besieged place to counterattack the enemy; The departure of ships from a post; The flying of an airplane on a combat mission.
10. A promise of nonaggression made in 1916 during World War I by Germany to the United States prior to the U.S. entry into the war.	11. A German submarine.
12. The system that uses a three-bearing cross to determine the location of a target.	
13. A method for detecting and locating objects submerged by echolocation.	



Module 1 Chapter 7: NS2-M1C7 – The Interwar Years

What Students Will Learn to Do:

Demonstrate an understanding of the Interwar Years, 1918 – 1941

Skills and Knowledge to be Gained:

1. Explain the conditions set forth in the Naval Disarmament Treaty
2. Identify the dictatorships that grew out of the great world depression
3. Explain the condition of the U.S. Navy during the prewar years
4. Explain the final steps toward war in Europe
5. Explain U.S. isolationism/involvement from 1935 until the United States declared war on Japan on 8 December 1941

Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.7. Analyze various accounts of a subject told in different mediums...

Writing

- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.9-10.8. Gather relevant information from multiple authoritative print and digital sources...
- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...

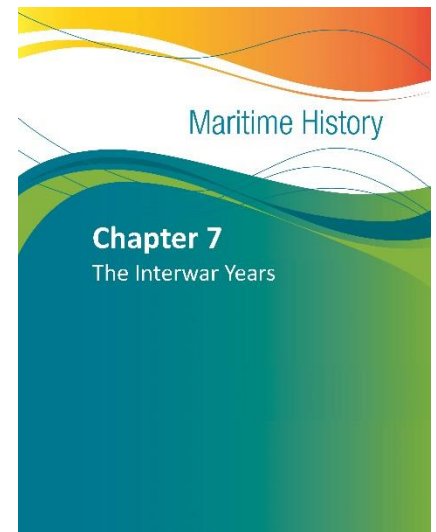
Language

- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Civic and Political Institutions

- D2.Civ.3.9-12. Analyze the impact of constitutions, laws, treaties, and international agreements on the maintenance of national and international order.



Module 1 Chapter 7: NS2-M1C7 – The Interwar Years

- D2.Civ.11.9-12. Evaluate multiple procedures for making governmental decisions at the local, state, national, and international levels in terms of the civic purposes achieved.

Dimension 2. Economic Decision Making

- D2.Eco.14.9-12. Analyze the role of comparative advantage in international trade of goods and services.

Dimension 2. Geography

- D2.Geo.5.9-12. Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.
- D2.Geo.11.9-12. Evaluate how economic globalization and the expanding use of scarce resources contribute to conflict and cooperation within and among countries.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...
- D2.His.14.9-12. Analyze multiple and complex causes and effects of events in the past.

Dimension 4. Communicating Conclusions and Taking Informed Action

- D4.2.9-12. Construct explanations using sound reasoning, correct sequence, examples, and details with significant and pertinent information and data...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 7 / Section 1: NS2-M1C7S1 – Prewar Events

(Section 1 of 2)

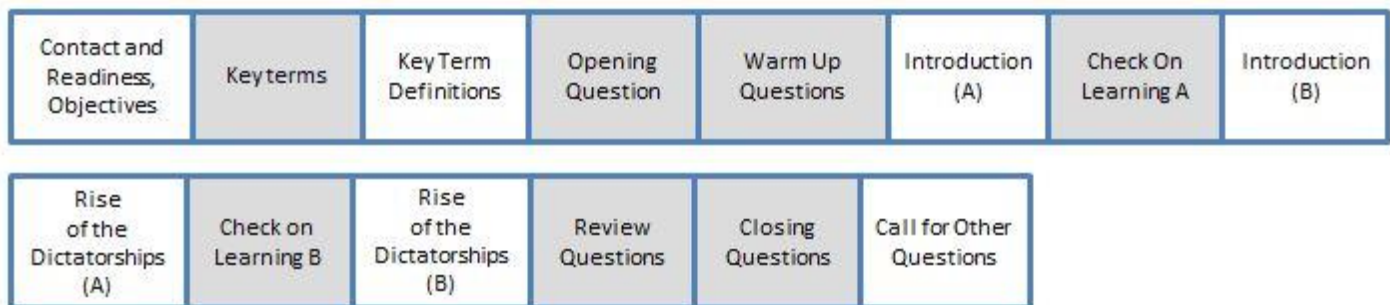
What Students Will Learn to Do:

Demonstrate an understanding of the Interwar Years, 1918 – 1941

Skills and Knowledge to be Gained:

1. Explain the conditions set forth in the Naval Disarmament Treaty
2. Identify the dictatorships that grew out of the great world depression
3. Explain the condition of the U.S. Navy during the prewar years

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 7. Place a checkmark beside the NS2-M1C7S1 PowerPoint presentation, and these two CPS question deck files:
NS2-M1C7S1 - Key Terms and NS2-M1C7S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 7 / Section 1: NS2-M1C7S1 – Prewar Events

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will discuss the disarmament treaties and America's policies of isolation and neutrality. We will discuss the rise of dictatorships, the collapse of most European powers to Germany, and the expansion of Japan leading to World War II.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-7
Opening Question(Random Pick a Student – "RPS")	This Opening Question is "Where do you think a country focused on isolationism would spend most of its time and money?" Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on the interwar years of 1918-1941.	8
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	9
Introduction	Explain that after World War I was over, the victorious Allies conferred at Versailles, France. They imposed their demands the following June on a defeated Germany. The resulting Treaty of Versailles included a requirement that Germany pay reparations (payments for economic injury) to the Allies, eventually set at \$33 billion. This was an amount far beyond Germany's ability to pay. The provision served to foster much resentment on the part of many Germans toward the Allies for years to come.	10
Introduction	Explain that as part of the treaty inserted at President Wilson's insistence, the Allies agreed to form the League of Nations, an organization in which the nations of the world would join together to ensure peace and security for all. The League included a mutual defense provision which stated that an attack on one would be defended by all. Despite many attempts by Wilson to gain support for it, the U.S. Congress refused to accept the treaty. Finally, in July 1921, after Wilson had been replaced as president by Warren Harding, Congress passed a resolution to end the war and in October, ratified separate peace treaties with the Axis powers.	11-12
Introduction	Explain that another treaty provision was that most of the newer German warships had to be turned over to the Allies. This provision was a severe blow to German morale. Germany was allowed to retain only half a dozen pre-dreadnought battleships and cruisers and twelve destroyers, but no submarines. At the end of hostilities, these	13

Chapter 7 / Section 1: NS2-M1C7S1 – Prewar Events

	vessels were ordered to proceed to Scapa Flow. However, before the Allies could take ownership of the forfeited vessels, the German navy succeeded in scuttling them all at Scapa Flow. The furious Allies then decreed that almost all of the remaining German navy's ships had to be turned over to the Allies.	
Introduction	Explain that soon after World War I a headlong rush "back to normalcy" had quickly made itself felt across the United States. Isolationism gained the favor of the American public. Naval building projects were vetoed as the country listened to the demands of pacifists to cut military spending. In 1921, there was a business recession, felt not only in the United States but also in other major industrial nations. President Harding decided it was time for the Allies to come to an agreement on arms limitations.	14-15
Introduction	Explain that in November, Britain, France, Italy, and Japan were invited to send representatives to a conference in Washington on naval disarmament. At the opening of the conference, the United States stunned the conferees with sweeping proposals to drastically reduce the standing navies of each of the major naval powers. Among other things, the United States, Britain, and Japan would agree to a 5:5:3 ratio in battleship tonnage. After several weeks of negotiations, the Washington Naval Disarmament Treaty was signed. This treaty limited the total tonnage of capital ships and placed limitations on the tonnage and armament of these ships and cruisers. The treaty limited battleships to nine 16-inch guns and cruisers to 8-inch guns. No limitations on total tonnage of cruisers were included.	16-17
Introduction	Explain that as a concession to the Japanese, who felt that the treaty gave them third-rate naval status, a so-called 'non-fortification clause' was inserted. This specified that no further fortifications in the Pacific area would be carried out by Japan, by the United States in any of its possessions west of Hawaii, or by the British anywhere east of Singapore and north of Australia.	18
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	19
Introduction	Explain that another treaty negotiated simultaneously "guaranteed" the territorial integrity of China.	20
Introduction	Explain that there were, of course, some Americans who voiced opposition to the treaty provisions. The United States would not remain one of the strongest naval powers in the world if it followed the agreements. But most Americans, concerned with the weak economy and wanting to stay isolated from events in Europe, could not be persuaded to spend money on warships. As might have been expected, soon after the treaty was signed, all the world powers except the United States began major heavy-cruiser building programs. Once they knew Britain and the United States would do nothing to contest such construction, the Japanese also proceeded to fortify major island bases in the Pacific.	21
Introduction	Explain that additional naval disarmament conferences were held on several occasions in succeeding years, but nothing of any significance was accomplished. For all practical purposes, there were no further treaty limitations on navies after 1936, when the ban on capital ship construction expired.	22
Introduction	Explain that in 1928, American isolationism led to another unusual attempt to avoid international conflict came in the form of the Kellogg-Briand Pact. This was a treaty worked out between Frank Kellogg, Coolidge's secretary of state, and French foreign minister Aristide Briand. Under its terms, fifteen nations tried to outlaw war by agreeing henceforth not to use the threat of war in their dealings with one another. Eventually more than sixty nations signed the treaty. Unfortunately, this idealistic	23

Chapter 7 / Section 1: NS2-M1C7S1 – Prewar Events

	treaty would soon be scrapped because it had no provisions for enforcement.	
Introduction	Explain that in the late 1920s and early 1930s, Presidents Coolidge and Hoover, faced with the aggressive building programs of the Europeans and Japan, reluctantly put construction bills before Congress. Unfortunately, pacifists, isolationists, and others who naively wanted the U.S. to abide by the Kellogg-Briand Pact forced Congress to reduce the programs to virtually nothing. It was not until President Franklin Roosevelt was inaugurated to his first term in 1933 that any substantial building of American naval warships resumed.	24-25
Rise of the Dictatorships	Explain that in the 1920's, after a short period of prosperity immediately following World War I, the economies of much of the world, including the United States, had begun to waver. Periods of recession and labor unrest alternated with almost dizzying heights of prosperity. Europe's faltering economy collapsed because of widespread inflation, first in Germany and then in other major nations. Revolution swept across Russia, and riots and strikes erupted throughout Europe. Finally, in 1929, the U.S. stock market collapsed. The great world Depression had begun.	26-27
Rise of the Dictatorships	Explain that in this climate of worldwide despair, anyone with a radical plan to end the depression—and a voice loud enough to be heard—could move crowds of disillusioned people to follow. In 1922, Benito Mussolini had come into power in Italy. He reawakened the grandeur of ancient Rome in the eyes of his followers. Mussolini inspired Italian workers to build up the country's military might so that he could re-establish Rome as the center of Mediterranean power. At the same time, Adolf Hitler initiated a propaganda campaign based on the premise of German superiority. He founded the Nazi Party in Germany and by 1932, the Nazi Party dominated the German government. When unrest swept Berlin in 1933, Hitler was named chancellor.	28-29
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	30
Rise of the Dictatorships	Explain that in 1924, the U.S. Congress passed an immigration bill classifying the Japanese as undesirable Orientals. The bill prohibited them from entering the United States under any circumstances. The Japanese <i>militarists</i> were now able to arouse national resentment against the United States and political support for themselves. During the early 1920s, Japanese moderates were fairly successful in keeping the militarists out of political control. However, once in control, the <i>militarists</i> selectively assassinated their political opposition and began to build up the Imperial armed forces.	31-32
Rise of the Dictatorships	Explain that by the early 1930s, the military dictatorships in Italy, Germany, and Japan were seeking to regain prosperity for their nation by conquering their neighbors. The democracies—Britain, France, and the United States—refused to take effective countermeasures against these aggressive acts. The lack of military response to this aggression unintentionally ushered in World War II.	33
Rise of the Dictatorships	Explain that in 1931 the Japanese leaders considered themselves powerful and so invaded China from their Korean bases. The United States and Britain protested the move as a violation of the Washington Treaty, but did nothing more. A similar protest by the League of Nations did little to stop Japan's three-month conquest of Manchuria - Japan simply withdrew from the League. The Japanese militarists recognized they had achieved the naval superiority in the western Pacific. Indeed, they had; the treaties had ensured little opposition to Japan's bid for world dominance.	34-35

Chapter 7 / Section 1: NS2-M1C7S1 – Prewar Events

Rise of the Dictatorships	Explain that in 1935 Hitler withdrew Germany from the League and refused to abide by any treaty limitations imposed on German armaments and military service. The Germans began rebuilding their armed forces, including capital ships and submarines for a new German navy. In response, the British negotiated naval building quotas with Germany limiting the number of surface warships to 35 percent of British tonnage, and submarines to 45 percent. Also, in 1935, the Italians invaded Ethiopia, annexing the country in 1936 and renaming it 'Italian East Africa'. When the League of Nations denounced the act as "bald aggression" and imposed economic sanctions, Italy purchased war supplies from Germany, withdrew from the League, and joined Germany in forming the Rome-Berlin Axis.	36-37
Rise of the Dictatorships	Explain that in early 1939, Hitler abolished the Anglo-German naval limitation agreement enabling Germany to begin building as many warships of whatever kind and tonnage it wanted. By the time war broke out in September of 1939 with Hitler invading Poland, the German Navy consisted of two 31,000-ton battleships, two 42,000-ton battleships nearing completion (the Tirpitz and Bismarck), three 20,000-ton pocket battleships, nine cruisers, a number of destroyers, and fifty-six submarines. Germany continued to build U-boats throughout the war at a furious rate. Before it was finally defeated in May 1945, Germany sent nearly 1,200 submarines into action against Allied shipping.	38-40
Review Question	The Review Question is "List 2-3 reasons you think dictatorships were able to gain power in Europe and Japan." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	41
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	42
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	43

III. Supplemental Activities -

A. In class Activity:

Supplies required: Handout *The Interwar Years*, Whiteboard or Mobi View

When: Distribute this activity at the beginning of the presentation and reading.

- During this period of time in history, numerous treaties and organizations were formed between countries of the world. As you read and discuss in class, make a list on the board list of the alliances and the ultimate outcome of each. Have the cadets choose two treaties or alliances and analyze the results. When was it formed? Who was involved? How long did it last? What was the final outcome?

Chapter 7 / Section 1: NS2-M1C7S1 – Prewar Events

B. Take Home Activity: Using the handout, “Ship Force Levels”, have the cadets use the website below and look at the Ship Force levels of the US Navy during the period 1919 to 1941. Ask cadets to describe what happened during this period. Pay particular attention to the battleships, cruisers, destroyers, submarines and total active ships. Identify ship types that had drastic changes in their inventory. When do you see change? Be sure to read the events and notes box listed on the website under each time period.

<http://www.history.navy.mil/branches/org9-4.htm>

IV. Evaluation - see CPS database for chapter test questions.

Chapter 7 / Section 1: NS2-M1C7S1 – Prewar Events

Activity 1: In-Class Activity – The Interwar Years

Name: _____ Date: _____ Class: _____

During this period of time in history, numerous treaties and organizations were formed between countries of the world. Choose two treaties or alliances from the list made with the class and analyze the results. When was it formed? Who was involved? How long did it last? What was the final outcome?

1. _____

2. _____

Chapter 7 / Section 1: NS2-M1C7S1 – Prewar Events

Activity1: Take Home Activity – Ship Force Levels

Name: _____ Date: _____ Class: _____

Directions: Using the website below, look at the Ship Force levels of the US Navy during the period 1919 to 1941 and describe the event of this period. Pay particular attention to the battleships, cruisers, destroyers, submarines and total active ships. Identify ship types that had dramatic changes to their inventory. When do you see change? Be sure to read the events and notes box listed on the website under each time period.

<http://www.history.navy.mil/branches/org9-4.htm>

Chapter 7 / Section 2: NS2-M1C7S2 – Final Steps Toward War

(Section 2 of 2)

What Students Will Learn to Do:

Demonstrate an understanding of the Interwar Years, 1918 – 1941

Skills and Knowledge to be Gained:

1. Explain the final steps toward war in Europe
2. Explain U.S. isolationism/involvement from 1935 until the United States declared war on Japan on 8 December 1941

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	U.S. Navy in the Prewar Years	Final Steps toward War (A)	Check On Learning A
Final Steps toward War (B)	American Drift toward War (A)	Check on Learning B	American Drift toward War (B)	In Summary	Review Questions	Closing Questions	Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 7. Place a checkmark beside the NS2-M1C7S2 PowerPoint presentation, and these two CPS question deck files:
NS2-M1C7S2 - Key Terms and NS2-M1C7S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 7 / Section 2: NS2-M1C7S2 – Final Steps Toward War

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will look at how the United States moved from a position of isolationism to one of involvement prior to actually declaring war on Japan. We will discuss how Japanese militarists would accept nothing less than full cooperation in their effort to conquer China—and America’s refusal to cooperate. War was inevitable. Finally, we will talk about the Japanese planning and preparation for attack on Pearl Harbor. American strategists anticipated the Japanese moves but felt Japan would confine itself to the Indies. No one believed it would take the risk of attacking Pearl Harbor, which was 3,500 miles from her objective. Learning about our nation’s history, including our errors, should make every new generation of citizens and leaders even stronger than the generation before.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-6
Opening Question(Random Pick a Student – “RPS”)	<p>This Opening Question is “List 2-3 reasons why restock and similar support of the fleet would be critical in wartime.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the final steps toward war.</p>	7
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	8
U.S. Navy in the Prewar Years	<p>Explain that after the Washington treaties, U.S. Navy strategists changed their planning as reflected in War Plan Orange. This was the contingency war plan that had been developed for the Pacific some years earlier. In the event of war in the Pacific, the strategists’ new plans included the necessity of making a comeback from an initial loss of bases in the Philippines and Guam. They saw that the Navy would probably have to fight its way back across the Pacific, operating for long periods far from its bases while seizing and converting enemy bases. The Navy faced three problems: (1) how to free the fleet from dependence on established bases, (2) how to isolate and attack enemy bases protected by land-based air units, and (3) how to invade and occupy heavily defended enemy bases.</p>	9-10

Chapter 7 / Section 2: NS2-M1C7S2 – Final Steps Toward War

U.S. Navy in the Prewar Years	Explain that the U.S. Marine Corps took on the task of working out problem number three. From this effort came the amphibious doctrine, which was put into effect in World War II. Amphibious operations emphasized the concepts of command and control, close air support, naval gunfire support, patrol tactics, and the development of new amphibian vehicles and landing craft. This amphibious capability, when expanded to meet the needs of the war, proved to be an unstoppable assault force. Many historians regard these amphibious tactics as the most far-reaching tactical innovations of the war.	11
U.S. Navy in the Prewar Years	Explain that during the same time, naval aircraft and aircraft carriers came into use on a sophisticated scale. Naval aviation was originally looked upon as merely a reconnaissance arm of the fleet. This changed in 1921 when General Billy Mitchell proved in a test that an airplane could sink a battleship with bombs. Mitchell's feat convinced Navy leaders to convert a collier into the Navy's first aircraft carrier, the <i>Langley</i> , and to get the treaty powers to consent to the United States building the carriers <i>Lexington</i> and <i>Saratoga</i> .	12
U.S. Navy in the Prewar Years	Explain that finally, with carriers, their aircraft, and amphibious forces working far from established home bases, a logistic support system had to be devised that would keep these forces in operation. First, there was the problem of mobile fuel and supply support. This problem was solved by the development of highly versatile at-sea replenishment capabilities: support ships moved with the fleet and resupplied it while under way. This innovation is sometimes regarded as "the secret weapon" that strategists believed would win the Pacific war	13
U.S. Navy in the Prewar Years	Explain that when a Marine amphibious force captured new areas from the enemy, new bases on that captured territory would have to be built rapidly. For this task the Naval Construction Battalions (NCBs, or "Seabees") were developed. The Seabees were trained to create operating bases in any environment, from jungle to rocky atoll. These bases included all the materials and personnel needed to set up various kinds of facilities. Depending upon the needs of the Area Commander, the bases could be rapidly built as soon as the land was cleared. Shortly thereafter the base would be in full operation.	14-15
Final Steps toward War	Explain that by 1936 the League of Nations was little more than a squabbling group, neither able nor willing to halt the drift toward world war. The aggressive dictatorships had withdrawn their memberships. In 1936 Germany remilitarized the Rhineland, in defiance of the Treaty of Versailles. In 1937 Japan launched a full-scale invasion of China, quickly conquering most of the eastern half of the country. During these Chinese operations, Japan repeatedly bombed U.S. missions, schools, churches, and hospitals, and even sank the U.S. Navy gunboat <i>Panay</i> . The United States limited its response to verbal and written protests. In 1938 Hitler invaded Austria. Betrayed by traitors from within, that nation became a province of Germany.	16-19
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	20
Final Steps toward War	Explain that British Prime Minister Neville Chamberlain now decided that the only way to avert war was to come to some agreement with Italy and Germany. He undertook what has become known as a policy of "appeasement." Under this policy, Britain and France made a series of concessions to Hitler and Mussolini in return for "promises of peace." In one of these deals Britain persuaded the league to recognize the Italian conquest of Ethiopia, an act that effectively destroyed the League. Next, Britain and France agreed to the takeover of Czechoslovakia by Germany.	21-22

Chapter 7 / Section 2: NS2-M1C7S2 – Final Steps Toward War

Final Steps toward War	Explain that when Hitler's next demand was for the free city of Danzig and a large segment of western Poland, Britain and France finally drew the line, abandoned the policy of appeasement, and aligned themselves with Poland. The Soviet Union, which had been angered by the British-French sellout on Czechoslovakia, now signed a nonaggression pact with Germany. Hitler was thus free of the Soviet threat from the east. On 1 September 1939 his armies invaded Poland in a massive offensive. Britain and France, henceforth referred to as the Allies, declared war on Germany two days later. World War II had begun.	23-24
American Drift toward War	Explain that between 1935 and 1939, as the Washington disarmament treaties collapsed, the United States retreated into a policy of isolationism and neutrality. When the Europeans declared war on each other, President Franklin Roosevelt established the Neutrality Patrol, which had as its task the reporting and tracking of belligerent ships and aircraft approaching the United States or the West Indies. Actually, President Roosevelt regarded the Neutrality Patrol as a means of preparing for the war he saw coming. The patrol enabled him to refit some ships and recall reserves to active duty for training and assignment at sea.	25
American Drift toward War	Explain that the American people were certainly opposed to the totalitarian governments and aggression of the Axis powers and Japan, but they wanted to stay out of the war. As the Nazi blitzkrieg rolled over Poland and conquered Belgium, Holland, Luxembourg, Norway, Denmark, and France—all by June 1940—President Roosevelt began to see the defeat of Britain as a possibility. He asked for assurances that the British fleet would not be turned over to Hitler in that event. Prime Minister Churchill replied that he could not guarantee this, since he probably would not be Prime Minister following a British defeat.	26-28
American Drift toward War	Explain that faced with the potential loss of the Royal Navy, which in effect served as the first line of U.S. defense, Congress finally recognized the necessity of expanding the U.S. Navy as Roosevelt had requested. Congress passed the Two-Ocean Navy bill, authorizing the President to build for each ocean a fleet sufficient to meet American defense needs.	29
American Drift toward War	Explain that events started to move faster for the United States. In September 1940 Roosevelt concluded a deal with Churchill in which the United States gave Britain fifty of its oldest destroyers and ten Coast Guard cutters in return for ninety-nine-year leases on sites for bases in the West Indies, Newfoundland, and Bermuda. In March of the following year, the famous Lend-Lease Act was passed, allowing the United States to "loan" war materials to Britain. This put U.S. industry on a wartime production level, because, as Roosevelt declared, America had become the "arsenal of democracy." The United States later seized Axis ships in American ports, froze German and Italian assets in the United States, occupied Greenland, and took over the defense of Iceland from Britain.	30-31
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	32
American Drift toward War	Explain that in 1941 high-ranking U.S. and British officers met secretly in Washington and drew up what was called the ABC-1 Staff Agreement. This agreement put the U.S. Navy in the war on the side of the Allies, since by its terms the Navy would be sharing escort duties for transatlantic convoys to Britain. The agreement also called for meetings between American and British Chiefs of Staff in order to make strategic plans. A key decision to come out of the meetings was that the United States would	33

Chapter 7 / Section 2: NS2-M1C7S2 – Final Steps Toward War

	make its principal military effort in the European theater, even if Japan made war on America. This decision was made because of Germany's greater military potential and because of the immediate danger faced by Britain	
American Drift toward War	Explain that in the meantime, the situation in the Pacific had also deteriorated. When France fell in 1940, the Japanese quickly declared a protectorate (a relationship of protection and partial control) over Indochina, taking control of the valuable rice crop and occupying the air and naval bases there. They also informed the Dutch authorities in the East Indies that the oil resources on those islands would now be developed "jointly" with them. It was clear that the Japanese were out to dominate the East Indies and its mineral resources. In reaction to this aggressive behavior, President Roosevelt immediately placed an embargo on the sale of aviation gasoline and scrap iron to Japan. Steel was added to the embargo two months later.	34-36
American Drift toward War	Explain that an embargo on oil was sure to be the next U.S. move. It came in July 1941, along with a freeze on all Japanese assets in the United States. Thus the Japanese could no longer pay in cash for Dutch East Indies oil. War was now inevitable. Japanese militarists would accept nothing less than full cooperation in their effort to conquer China—and America would not give it to them.	37
American Drift toward War	Explain that though some earlier actions had taken place between German submarines and U.S. Naval escorts, it was not until 16 October 1941 that the first casualties were sustained by the two undeclared enemies. On that date, a U.S. destroyer was damaged by a torpedo with the loss of eleven men. In early November a naval tanker and the destroyer USS Reuben James were sunk with heavy losses. That caused Congress to remove the last feature of the U.S. neutrality policy. U.S. merchant ships were now armed and authorized to carry lend-lease goods directly to Britain.	38-39
American Drift toward War	Explain that it would still be that the Japanese would bring the United States totally into the war. On 7 December 1941, the Japanese launched a carefully planned surprise carrier attack on Pearl Harbor, Hawaii. The following day Congress declared war on Japan. On 11 December Germany and Italy declared war on the United States. The United States declared war on those countries that same day.	40-41
In Summary	1918 Treaty of Versailles 1921 Washington Naval Disarmament Treaty 1929 U.S. stock market collapses 1933 Hitler becomes German chancellor 1937 Japan invades China 1938 Germany invades Austria 1939 World War II begins in Europe 1940 France falls to Germany 1940-41 U.S. enacts Japanese embargoes; U.S. declares war on Axis powers	42-43
Review Question	The Review Question is "List 2-3 reasons why the efforts to limit size and armaments of warships during this time period were futile." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	44
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	45
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	46

Chapter 7 / Section 2: NS2-M1C7S2 – Final Steps Toward War

III. Supplemental Activities -

A. In Class Activity:

Supplies Needed: Handout for take home activity

When: Can be used at any time during the lesson

- War Plan Orange was developed as a contingency War Plan for the Pacific Theatre. In it, the Navy found itself faced with a three-fold problem. Have a class discussion about which aspect of the Pacific War problem did the Naval Construction Battalions, Seabees, resolve and why?

B. Take Home Activity: Using the handout “Final Steps toward War”, have the cadets write a paragraph about why the embargo on the sale of specific goods to Japan set in motion the path to inevitable war.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 7 / Section 2: NS2-M1C7S2 – Final Steps Toward War

Activity 1: Take Home Activity- Final Steps toward War

Name: _____ Date: _____ Class: _____

Directions: Write a paragraph about why the embargo on the sale of specific goods to Japan set in motion the path to inevitable war.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

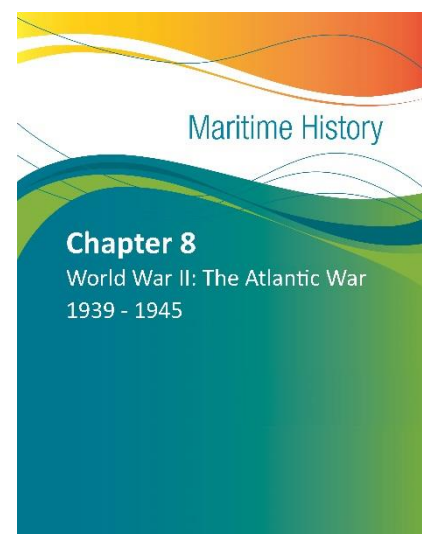
Module 1 Chapter 8: NS2M1C8 – World War II: The Atlantic War 1939 - 1945

What Students Will Learn to Do:

Demonstrate an understanding of naval history of World War II: The Atlantic War, 1941 – 1945

Skills and Knowledge to be Gained:

1. Explain the events that took place in Europe in 1939 – 1940
2. Explain the importance of the Battle of the Atlantic
3. Describe the first Allied offensive operation
4. Explain the significance of the Battle of Stalingrad on the Eastern Front
5. Cite the joint decisions made by Roosevelt and Churchill at the Casablanca Conference
6. Describe the first major attempt by the Allies to take the home territory of an Axis nation
7. Describe the events that took place in Europe in 1939 – 1940
8. Explain the outcome of the battle of Anzio
9. Explain why successful Allied air attacks in Operation Overlord were essential to the success of the invasion of Normandy
10. Describe the major events of D-Day in Normandy
11. Describe the major events of Operation Anvil: Invasion of Southern France
12. Describe the last few months in Europe before the German forces surrendered



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Writing

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...

Module 1 Chapter 8: NS2M1C8 – World War II: The Atlantic War 1939 - 1945

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.3. Apply knowledge of language to understand how language functions in different contexts...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Civic and Political Institutions

- D2.Civ.3.9-12. Analyze the impact of constitutions, laws, treaties, and international agreements on the maintenance of national and international order.

Dimension 2. Geography

- D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...
- D2.His.14.9-12. Analyze multiple and complex causes and effects of events in the past.
- D2.His.16.9-12. Integrate evidence from multiple relevant historical sources and interpretations into a reasoned argument about the past.

Dimension 4. Communicating Conclusions and Taking Informed Action

- D4.2.9-12. Construct explanations using sound reasoning, correct sequence, examples, and details with significant and pertinent information and data...
- D4.6.9-12. Use disciplinary and interdisciplinary lenses to understand the characteristics and causes of local, regional, and global problem...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 8 / Section 1: NS2-M1C8S1 –World War II in the Atlantic

(Section 1 of 4)

What Students Will Learn to Do:

Demonstrate an understanding of Naval history of World War II: The Atlantic War, 1941 – 1945

Skills and Knowledge to be Gained:

1. Explain the events that took place in Europe in 1939 - 1940

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction (A)	Video1 Introduction to World War II	Introduction (B)
Check On Learning A	Video2 Introduction to World War II	Battle of Britain (A)	Video1 Battle of Britain	Battle of Britain (B)	Check on Learning B	Video2 Battle of Britain	America Joins the Allies (A)
Video1 America Joins the Allies	America Joins the Allies (B)	Video2 America Joins the Allies	America Joins the Allies (C)	Review Questions	Closing Questions	Call for Other Questions	

Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 8. Place a checkmark beside the NS2-M1C8S1 PowerPoint presentation, and these two CPS question deck files: NS2-M1C8S1 - Key Terms and NS2-M1C8S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 8 / Section 1: NS2-M1C8S1 –World War II in the Atlantic

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons. In this lesson, we will discuss the events that led to war and the Navy's role in World War II in the Atlantic.	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5
Opening Question(Random Pick a Student – "RPS")	This Opening Question is "Why do you think Americans were so reluctant to get involved with the war in Europe?" Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on the introduction to World War II.	6
Warm-Up Questions(Lesson questions 1-2)	Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions. Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.	7
Introduction	Explain that when Germany invaded Poland in September 1939, the German Army used a revolutionary new tactic called blitzkrieg (lightning war). Rather than move overland on foot, German troops used motor vehicles and tanks to advance deep into enemy territory before the defenses could react. Germany overran western Poland by the end of the month. In mid-September, under terms of a nonaggression pact secretly negotiated with Hitler, the Soviet leader Stalin invaded and captured eastern Poland.	8-10
Video 1 on Introduction to World War II	Show video 1 on the introduction to World War II.	11
Introduction	Explain that for the next six months the war entered a quiet phase, during which Germany massed troops and equipment along the Maginot Line, a massive system of fortifications along the border between France and Germany. Then in April 1940, Hitler invaded Denmark and Norway. In May, German troops maneuvered around the Maginot Line and rapidly advanced across Belgium, the Netherlands, and France. All three countries were soon overcome by Hitler's troops.	12-14
Introduction	Explain that British troops that had been sent into France to counter the initial German buildup now hastily retreated to the coastal city of Dunkirk on the English Channel. There, in an amazing operation over a nine-day period from late May into early June,	15-16

Chapter 8 / Section 1: NS2-M1C8S1 –World War II in the Atlantic

	nearly 340,000 English soldiers were successfully evacuated across the channel to England by a 900-vessel fleet of mainly civilian tugboats, yachts, and other small craft—all this despite continual air attacks by the German Luftwaffe (air force).	
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	17
Video 2 on Introduction to World War II	Show video 2 on the introduction to World War II.	18
Introduction	Explain that in June, 1940, German troops entered Paris and very soon, France surrendered. An armistice between the two countries was concluded a week later. A new French government called the Vichy government was set up by Marshal Philippe Pétain. By terms of the armistice agreement, the Vichy government was given nominal sovereignty over the southeastern two-fifths of France not yet occupied by German military forces, and it controlled most of the surviving French military forces. Never recognized by the Allies, Vichy was in fact, under German control throughout its existence. It eventually collapsed with the defeat of Germany in 1945. Meanwhile, in London, General Charles de Gaulle organized a resistance movement called the Free French. They rejected the Vichy government and did what they could to support the Allies throughout the war. They eventually formed the nucleus of the Fourth Republican government headed by de Gaulle after the war.	19-22
Introduction	Explain that in just three months, Hitler had conquered most of western Europe and German troops were massing along the coast opposite Britain, just 20 miles away across the English Channel.	23
Battle of Britain	Explain that the Strategy for Operation "Sea Lion" invasion of Britain included moving troops across the channel by barge. However Germany did not have control of the channel by sea, therefore they needed to gain control of the channel by air to protect the troop movement. The Battle of Britain began on July 10, 1940.	
Video 1 on Battle of Britain	Show video 1 on Battle of Britain	26
Battle of Britain	Explain that in what has since become known as the Battle of Britain, as many as 1,000 sorties a day were carried out by Luftwaffe bombers against targets throughout all of England at first, then later concentrated against London. To counter them, Royal Air Force pilots flying the famous Spitfire fighters often flew six and seven missions a day, inflicting heavy losses on the attackers. Inspired by Prime Minister Winston Churchill, the British people never lost their will to resist, despite massive losses. By June 1941, when Hitler finally ended the bombing campaign, over 150,000 Londoners had been killed or injured. "Never in the field of human conflict was so much owed by so many to so few," said Churchill in praise of the courageous performance of the RAF.	27-30
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	31
Video 2 on Battle of Britain	Show video 2 on Battle of Britain	32

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America Joins the Allies	Explain that in late 1940, Hitler sent General Erwin Rommel and his Afrika Korps into North Africa, where they had much early success in driving back the British and advancing into Egypt. For a year and a half after that, the North African campaign was a back-and-forth affair that depended on which side was being better resupplied at the moment.	33-35
America Joins the Allies	Explain that in early 1941, both British and American intelligence began picking up information that, in spite of the nonaggression pact the Soviets and Germans had signed, Hitler was about to invade the Soviet Union. Both governments informed the Soviets, but they chose to disregard the warnings. In June, Hitler launched a major invasion of the Soviet Union, forcing the Soviet Union to join forces with the Allies. Over the next four years, fighting along the eastern front in the Soviet Union would be some of the bloodiest battles the world had ever known. Altogether there would be over 25 million Soviet casualties and 5 million German casualties.	36
America Joins the Allies	Explain that despite these events taking place in Europe, the majority of Americans wanted no part in the European conflict. President Franklin Roosevelt, however, reelected for a third term in 1940, felt differently. As mentioned in the last chapter, he took many measures to prepare America for war and to intensify American military industrial production to wartime levels.	37-38
Video 1 on America Joins the Allies	Show video 1 on America joins the allies	39
America Joins the Allies	Explain that the Japanese surprise attack on Pearl Harbor on 7 December 1941, stunned the American people and galvanized them into action. America was now ready to go to war.	40
Video 2 on America Joins the Allies	Show video 2 on America joins the allies	41
America Joins the Allies	Explain that three days after the Japanese attack on Pearl Harbor, Germany and Italy joined Japan in declaring war on the United States. The second of two world wars had come to America.	42
America Joins the Allies	Explain that a reorganization of Navy commands followed the Pearl Harbor attack and the declarations of war. Admiral Ernest J. King became Commander in Chief of the U.S. fleet. He would also become the Chief of Naval Operations in March 1942. It was under his guidance that the United States would contribute to the defeat of Germany in the Atlantic and achieve victory over Japan in the Pacific.	43
Review Question	The Review Question is, “List 2-3 things that FDR did to prepare the U.S. to go to war.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	44
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	45
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	46

Chapter 8 / Section 1: NS2-M1C8S1 –World War II in the Atlantic

III. Supplemental Activities -

A. In Class Activity:

Supplies required: handouts for in class and take home activities

When: Anytime during the lesson

- Have the Cadets fill out the handout “Major Participants of WWII” and then discuss what roles the leaders and major participants played.

B. Take Home Activity: Using the handout “Human Conflict” Have the cadets write a paragraph on the meaning of Winston Churchill’s saying ““Never in the field of human conflict was so much owed by so many to so few.” Have them be prepared to share and defend their answers.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 8 / Section 1: NS2-M1C8S1 –World War II in the Atlantic

Activity 1: In-Class Activity – Major Participants of WWII

Name: _____ Date: _____ Class: _____

Directions: Identify the leaders of the major participants of WW II and country.

The Allies		The Axis Powers	
Leader	Country	Leader	Country

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Activity 1: Take Home Activity – Human Conflict

Name: _____ Date: _____ Class: _____

Directions: Write a paragraph on the meaning of Winston Churchill's saying ""Never in the field of human conflict was so much owed by so many to so few." Have them be prepared to share and defend their answers.

[illegible]

Chapter 8 / Section 2: NS2-M1C8S2 – The Battle of the Atlantic

(Section 2 of 4)

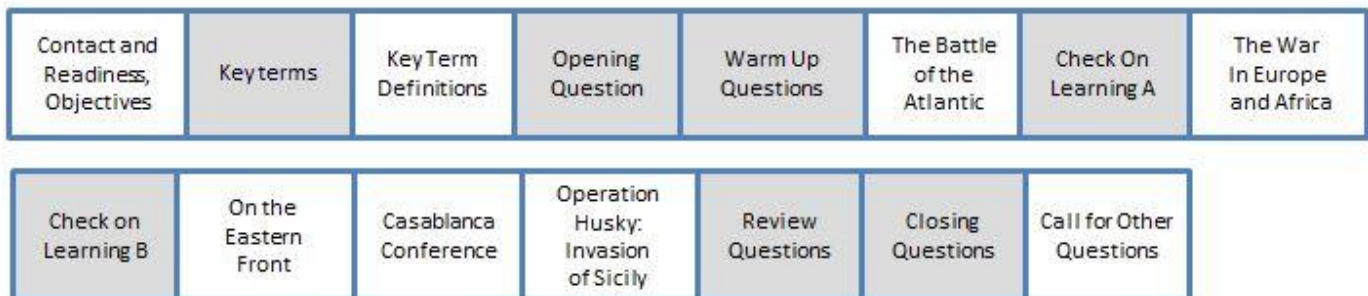
What Students Will Learn to Do:

Demonstrate an understanding of Naval history of World War II: The Atlantic War, 1941 – 1945

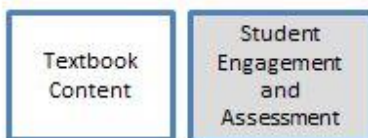
Skills and Knowledge to be Gained:

1. Explain the importance of the Battle of the Atlantic
2. Describe the first Allied offensive operation
3. Explain the significance of the Battle of Stalingrad on the Eastern Front
4. Cite the joint decisions made by Roosevelt and Churchill at the Casablanca Conference
5. Describe the first major attempt by the Allies to take the home territory of an Axis nation

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 8. Place a checkmark beside the NS2-M1C8S2 PowerPoint presentation, and these two CPS question deck files: NS2-M1C8S2 - Key Terms and NS2-M1C8S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 8 / Section 2: NS2-M1C8S2 – The Battle of the Atlantic

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will discuss how the German U-boat began the slaughter of defenseless cargo ships and tankers in the Atlantic and the effect this action had upon the war in Europe. The Allies knew that little could be done against the Germans in Europe until the submarine menace in the Atlantic had been eliminated. We will look at how the United States and Britain made a concerted effort against his German offensive. We will look at how technology played a part in the war and look at some of the methods used to curtail the German U-boat operations.</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-7
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is “List 2-3 facts about the Vichy French.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the Battle of the Atlantic.	8
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	9
The Battle of the Atlantic	Explain that when World War II broke out in September 1939, the German admiral in charge of U-boat operations, Admiral Karl Dönitz, tried to put as many submarines at sea as possible so as to disrupt the flow of food and war materials to Britain. At first he was hampered in his efforts by the small number of German U-boats (only fifty-six when war started), and by the distances they had to proceed in order to get to the western Atlantic sea-lanes from their bases in Germany. Once Norway and France had been conquered, however, the situation changed.	10
The Battle of the Atlantic	Explain while secondary bases of operation were established in Norway, Dönitz personally supervised the construction of fortified submarine bases along the French Atlantic coast at Brest, Lorient, St. Nazaire, La Pallice, and Bordeaux. Submarines operating out of these bases could cut their transit time to the hunting grounds in the western Atlantic by one half. Moreover, German submarine production was continually increasing. By July 1940, there were many more U-boats on station in the Atlantic at any given time than in the opening months of the war. Dönitz gave his crew the instructions to pursue, attack and destroy.	11-12

Chapter 8 / Section 2: NS2-M1C8S2 – The Battle of the Atlantic

The Battle of the Atlantic	Explain that because of a limited number of available escorts and lack of any effective convoy operations, Allied losses to the U-boats began to rapidly mount. Admiral Dönitz often used wolf-pack tactics, with as many as twenty or thirty U-boats coordinating their attacks. Often the targeted merchantmen were silhouetted by bright lights all along the shores of the U.S. Atlantic seaboard. By fall of 1940, German U-boats were sinking about 300,000 tons of Allied shipping per month. German successes were having such an effect into oil supplies that fuel rationing had to be imposed in the northeastern United States.	13-14
The Battle of the Atlantic	Explain that a particularly difficult phase of the North Atlantic sea war involved the Allied convoys to the Russian port of Murmansk on the Barents Sea. During the German offensives into the Soviet Union in 1942 and 1943, Allied assistance to Soviet forces was slowed to a trickle. Sometimes, less than 40 percent of a given convoy made it to Murmansk. However, the perseverance of the Allied merchantmen and Allied escort ships finally broke Germany's efforts to destroy the convoys. Some historians believe that the supplies received through Murmansk were a decisive factor in preventing Russian surrender to the Germans during the war.	15
The Battle of the Atlantic	Explain that President Roosevelt and Prime Minister Churchill realized that little could be done against the Germans in Europe until the submarine menace in the Atlantic had been brought under control. Every effort was made to defeat the U-boats. By early 1941, enough escort vessels had been built so that most merchant vessels could be convoyed at least part of the way on each side of the Atlantic.	16
The Battle of the Atlantic	Explain that in addition, an improved radar system was developed that allowed convoy escort ships to detect and track surfaced U-boats. By May 1941, the German Kriegsmarine's code had been broken by British code breakers allowing the British to decipher Dönitz's instructions to his wolf packs at sea. The British could then steer convoys away from the wolf packs.	17-18
The Battle of the Atlantic	Explain that by late 1941, increasingly effective coastal air patrols inhibited U-boat operations off the U.S. Atlantic seaboard and the Gulf of Mexico and also off South America by 1942. British patrols flying out of Iceland did the same for the western approaches to Britain. Eventually these combined efforts began to pay dividends. In 1940, twenty-six Allied vessels were sunk for every U-boat lost. By 1942, that ratio had been cut to thirteen to one. However, this was still serious. By this time, the Germans were producing approximately twenty new U-boats per month - but the tide was turning. By 1943, with the addition of the escort carrier and hunter-killer groups, and including sufficient numbers of escorts to accompany convoys all the way across the Atlantic, the rate of exchange had fallen to just two vessels lost for every U-boat sunk.	19-21
The Battle of the Atlantic	Explain that thereafter, continued improvements in radio-direction-finding techniques and hunter-killer operations kept the U-boats virtually under control and out of the Atlantic sea-lanes until the war's end in 1945. After the liberation of France in 1944, most U-boats operated from bases in Norway. Toward the end of the war, U-boats fitted with breathing tubes called snorkels (which permitted them to operate diesel engines while submerged) attempted a last blitz against Allied shipping in British waters. Some U-boats even patrolled once again in U.S. waters, but these efforts came too late to affect the outcome of the war.	22
The Battle of the Atlantic	Explain that notable among U.S. antisubmarine group exploits was an incident involving the German submarine <i>U-505</i> in June 1944. The <i>U-505</i> had been tracked from the time she left her base in Brest until she headed home northward from a cruise in the south Atlantic. With this information Captain Dan Gallery and his group, led by the escort carrier <i>Guadalcanal</i> intercepted <i>U-505</i> and blasted her to the surface with depth charges and hedgehogs. The defeated crew set demolition charges and abandoned ship, but before the U-boat could sink, a specially trained American salvage	23-24

Chapter 8 / Section 2: NS2-M1C8S2 – The Battle of the Atlantic

	party boarded the <i>U-505</i> .	
The Battle of the Atlantic	Explain that they disconnected the demolition charges, closed the sea valves, and captured the U-boat and her entire crew. They then pumped out the waterlogged boat and towed her to Bermuda. After the war, the <i>U-505</i> was restored, and has since been on display at the Museum of Science and Industry in Chicago, Illinois.	25
The Battle of the Atlantic	Explain that during the Battle of the Atlantic, in all, the Allies lost 2,775 merchant ships, amounting to 23 million tons. Of this, 14.5 million tons were sunk by German U-boats. The Germans entered 1,175 U-boats into the war, and lost 781. They used the capital ships they had at the beginning of the war and those completed during it as independent surface raiders. Though they scored some notable successes, most of these were eventually hunted down by the Allies and sunk or blockaded in port.	26
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	27
The War in Europe and Africa	Explain that in the spring of 1942 the German armies were consolidating their positions in France and North Africa. Nowhere were things going well for the Allies. American military leaders and Stalin in the Soviet Union wanted to bring the war directly to Hitler with an invasion in Europe. Cooler British heads prevailed, convincing President Roosevelt that the Allies were not ready for such a major undertaking in the face of Hitler's superior forces.	28-30
The War in Europe and Africa	Explain that yet, the Allies had to do something in order to recover the momentum. Winston Churchill proposed an invasion of French North Africa in order to take the pressure off British forces in Egypt. Field Marshal Erwin Rommel, the "Desert Fox" commanding the elite German Afrika Korps, was heading toward Suez. The loss of the Suez would be extremely serious for the Allies. Churchill believed an Allied invasion would also have the secondary benefit of drawing German forces to Africa and away from the beaches of Europe. Once in Africa, they could not be easily returned to the continent because of increasing Allied control of the Mediterranean Sea area.	31-32
The War in Europe and Africa	Explain that Operation Torch was planned for 8 November 1942. This became the first Allied offensive operation against the Axis in the European–North African theater. American amphibious forces making up the Western Naval Task Force were to come from East Coast ports and converge on French Morocco. They were to land on three beaches near the primary objective, the port of Casablanca.	33-34
The War in Europe and Africa	Explain that combined British and American forces making up the Central Naval Task Force would invade Oran, in Algeria. A third combined contingent, called the Eastern Naval Task Force, would seize Algiers. Lieutenant General Dwight Eisenhower was the Supreme Commander, and Admiral Kent Hewitt, USN, was the Amphibious Task Force Commander.	35
The War in Europe and Africa	Explain that the big question mark of Operation Torch concerned the Vichy French forces in the area. Would the French resist the landings? The invasion thus became a political problem as well as a military problem. If the French decided to conduct serious resistance, they might well be able to hold off the Allies until German reinforcements arrived. This could doom the invasion and set up a major disaster for the Allies in North Africa.	36
The War in Europe	Explain that before Operation Torch was launched, General Mark Clark landed secretly	37

Chapter 8 / Section 2: NS2-M1C8S2 – The Battle of the Atlantic

and Africa	from a submarine to persuade the Vichy French authorities to support the Allied landings. French General Giraud was rescued from Vichy France and brought to Algeria in order to transition local French armed forces from Vichy loyalty to Free French.	
The War in Europe and Africa	Explain that as it turned out, the Vichy French Navy and a few shore batteries resisted with a spirited defense at Casablanca, but this was quickly eliminated by U.S. Navy gunfire. The French then quickly surrendered and joined forces with de Gaulle's Free French (in accordance with secret orders from Marshal Pétain, the French leader in Vichy). In response, Hitler's armies immediately occupied the previously unoccupied parts of France. Operation Torch, though anything but smooth, met all the intended objectives. The operation also showed that the Allies were by no means ready to invade Hitler's Europe. Much more training, larger forces, and better equipment would be necessary before invasion would be possible.	38-39
The War in Europe and Africa	Explain that the North African operations set up one of the first major defeats for the Axis. Shortly before the Allied landings in Morocco and Algeria, British Field Marshal Bernard Montgomery's Eighth Army routed the Afrika Korps at El Alamein, thus removing the threat to Suez. The Allies then squeezed the Germans and Italians between them into Tunisia. (Rommel escaped to Germany in the closing days of the campaign.) In May, the fighting in North Africa ended with the defeat and capture of the entire Afrika Korps, about 275,000 troops, and all of their remaining equipment.	40-42
The War in Europe and Africa	Explain that in November 1942 the Allies had landed in North Africa. The French forcers there had joined Free French. The Germans occupied Vichy France. As an indirect result of the Allied victory in Africa, most of the main units of the Vichy French Naval fleet were subsequently scuttled at Toulon, including 8 cruisers, 30 destroyers, and 16 submarines.	43-44
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	45
On the Eastern Front	Explain that in the winter of 1942-43, the Soviets had surrounded and defeated an entire German army at Stalingrad, an industrial city on the Volga River. They took 330,000 prisoners in one of history's most savage battles. The Battle of Stalingrad turned the tide on the eastern front. The Soviet advance, begun in February 1943, did not stop until the Red Army entered the German capital of Berlin two years later.	46
Casablanca Conference	Explain that in January 1943, President Roosevelt and Prime Minister Churchill met in the famous Casablanca Conference. They decided that, before any major offensives were to succeed elsewhere, antisubmarine warfare in the Atlantic had to be given top priority. This was when merchant shipping losses along the U.S. East Coast were at their peak. Second, the Allied leaders agreed that the next offensive operation against the Axis would be an invasion of Sicily in July. The Mediterranean sea-lanes were now reasonably secure, except from land-based air attack. Finally, the leaders announced that the Allies would demand nothing short of the unconditional surrender of Germany, Italy, and Japan.	47-48
Operation Husky: Invasion of Sicily	Explain that with the success of North Africa still fresh in the minds of all, Allied forces under the command of General Eisenhower prepared for a massive invasion of Sicily, code named Operation Husky. This was to be the first major attempt to take the home territory of an Axis nation. On 9 July 1943, the invasion took place on beaches on the southern side of the island. Admiral Hewitt again commanded the American amphibious forces, while Field Marshal Montgomery commanded the British Eighth Army. Over 580 ships landed and supported approximately 470,000 Allied troops on the island. The Allies were opposed by approximately 270,000 Italian and German infantry and air force support troops.	49-50

Chapter 8 / Section 2: NS2-M1C8S2 – The Battle of the Atlantic

Operation Husky: Invasion of Sicily	Explain that a force of newly developed amphibious ships and assault craft—LSTs, DUKWs, LCIs, LCTs, and LCVPs—took part in the invasion. Axis tanks leading strong armored counterattacks were driven off the field by effective naval gunfire, thus allowing the Americans and British to advance. Soon the 350,000 troops of Italian General Alfredo Guzzoni were in full retreat, chased by General George Patton’s tanks and Montgomery’s forces. Patton proved to be a masterful field commander, rapidly moving his armor to best advantage and chasing the retreating Axis armies toward Messina and an evacuation of the island. Only about one-third of the Axis armies escaped to Italy with their equipment.	51-56
Operation Husky: Invasion of Sicily	Explain that by 17 August, Sicily was under Allied control. The campaign lasted 39 days. Allied forces had sustained some heavy casualties at the hands of the German Luftwaffe, but the new amphibious ships, detailed training, planning, and rehearsals paid off handsomely.	57
Operation Husky: Invasion of Sicily	Explain that the Sicilian campaign was a major triumph for the Allies, for it largely eliminated Italy from the war. On 25 July, 1943, King Victor Emmanuel II deposed Mussolini and put him in “protective custody.” Marshal Pietro Badoglio, the new head of government, said publicly that he would continue the war against the Allies, but in private he began negotiations that would lead to surrender. Meanwhile, Eisenhower’s staff began immediate planning for the invasion of Italy. On 12 September 1943, Mussolini escaped on 12 September 1943, with German airborne troops using gliders. With Hitler’s backing, Mussolini attempted to regain power in Northern Italy.	58-59
Operation Husky: Invasion of Sicily	Explain that Sicily was also a victory for the logistician and staff planner. However it was overshadowed by the Normandy Invasion a year later. Explain to that point, in terms of the size of the landing zone and the number of divisions put ashore on the first day of the invasion, it was the largest amphibious operation of World War II.	60
Review Question	The Review Question is “Describe what happened in May 1941, that gave the Allies a significant boost in ability to fight the Axis forces.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	61
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	62
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	63

Chapter 8 / Section 2: NS2-M1C8S2 – The Battle of the Atlantic

III. Supplemental Activities –

A. In Class Activity:

Supplies required: none

When: At the end of the lesson

- Have the cadets write a paragraph answering the following questions:
Why was Operation Torch important for the Allies?
What did the Allies hope to gain?

B. Take Home Activity: Explain that in order to help in Europe, Roosevelt and Churchill both realized the German U-boats had to be controlled. Using the handout “German U-Boats”, have the cadets make a list of the things needing to be done to make this happen. Include items e.g.: new equipment, improvements, changes in procedures, etc.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 8 / Section 2: NS2-M1C8S2 – The Battle of the Atlantic

Activity 1: Take Home Activity- German U-Boats

Name: _____ Date: _____ Class: _____

Directions: In order to help in Europe, Roosevelt and Churchill both realized the German U-boats had to be controlled. Make a list of the things needing to be done to make this happen. Include items e.g.: new equipment, improvements, changes in procedures, etc.

Chapter 8 / Section3: NS2-M1C8S3 – The Italian Campaigns

(Section 3 of 4)

What Students Will Learn to Do:

Demonstrate an understanding of Naval history of World War II: The Atlantic War, 1941 – 1945

Skills and Knowledge to be Gained:

1. Describe the events that took place in Europe in 1939 – 1940
2. Explain the outcome of the Battle of Anzio
3. Explain why successful Allied air attacks in Operation Overlord were essential to the success of the Invasion of Normandy
4. Describe the major events of D-Day in Normandy

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	The Italian Campaigns	Check On Learning A	Operation Overlord: The Invasion of Normandy (A)
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Check on Learning B	Operation Overlord: The Invasion of Normandy (B)	Review Questions	Closing Questions	Call for Other Questions
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Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 8. Place a checkmark beside the NS2-M1C8S3 PowerPoint presentation, and these two CPS question deck files: NS2-M1C8S3 - Key Terms and NS2-M1C8S3 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 8 / Section3: NS2-M1C8S3 – The Italian Campaigns

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will discuss military campaigns that involved entire land, sea, and air areas that were directly involved in the war operation in Europe and the Atlantic. Operations like the invasion of southern France, the Battle at Stalingrad, the conference between Roosevelt and Churchill at Casablanca; the invasions of Sicily, Italy, and Rome, D-Day in Normandy, and finally, the surrender of Germany. Remember this was a World War and as these events were occurring in Europe and in the Atlantic, there were also battles waging in the Pacific.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-6
Opening Question(Random Pick a Student – “RPS”)	<p>This Opening Question is “List 2-3 environmental or geographic factors that should be considered when planning an attack.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the Italian campaigns.</p>	7
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	8
The Italian Campaigns	<p>Explain that on the eve of 8 September, just before the invasion of Italy at Salerno, the Italian government announced an armistice. Much of the Italian fleet steamed out of the northern ports of Genoa and La Spezia to surrender at Malta.</p> <p>Explain that the Allies still had to contend with the Germans. Montgomery’s army had crossed the Strait of Messina to the mainland on 3 September with little opposition. The Germans, however, had sensed a landing planned for Salerno and had mined and fortified the beaches in anticipation of the attack.</p>	9-10
The Italian Campaigns	Explain that when the landings, designated Operation Avalanche, occurred on 9 September, the amphibious forces of Admiral Hewitt and General Mark Clark met with	11-12

Chapter 8 / Section3: NS2-M1C8S3 – The Italian Campaigns

	<p>fierce German resistance.</p> <p>Explain that German forces had the beaches well covered, and motorized vehicles and tanks were positioned overlooking the landing sites. The Luftwaffe was standing by to turn the beaches into an inferno. In spite of these defenses, the Allied forces secured a precarious beachhead, but sustained heavy losses. The beachhead was repeatedly saved by US Naval gunfire support. Noting the reliance of Allied forces on the supporting warships, the Nazis hurled the bulk of their air power at these ships. The Germans introduced radio-controlled glide bombs, which caused severe damage to a number of British and American cruisers. Three destroyers were sunk, and many ships were damaged.</p>	
The Italian Campaigns	<p>Explain that the Allied beachhead held. German tactical errors in the field halted their counterattacks in mid-September. A strategic error by Field Marshal Rommel withheld German reinforcements from the north—when they could probably have turned the momentum to the Germans. On 16 September, Montgomery’s Eighth Army joined forces with Clark’s Fifth Army, and the Germans withdrew to a new defense line north of Naples. The great port city of Naples was occupied by the Fifth Army on 1 October. The port was a shambles, and the harbor was cluttered with sunken, booby-trapped ships scuttled by the Germans. Clearance of the harbor was assigned to the Seabees, who, despite incredible obstacles, were successful within four months. Meanwhile, the Allies began their buildup for further movement northward.</p>	13-14
The Italian Campaigns	<p>Explain that the Germans had consolidated their forces at the Gustav Line, about halfway between Naples and Rome. To bypass these defenses, the Allies planned an “end run”—an amphibious assault on Anzio Beach, approximately 37 miles south of Rome. The planning was complicated by the fact that many of the Allied forces in the Mediterranean theater were being transferred to England in preparation for the great invasion of France across the English Channel.</p>	15
The Italian Campaigns	<p>Explain that nevertheless, the landing was made on 22 January 1944 with only two reinforced divisions. The initial landing met with little resistance, but the Germans quickly moved in to stop any forward movement by the relatively small Allied invasion force. Allied reinforcements poured into the small area, but the Germans kept reinforcing their surrounding forces at a similar rate, building up powerful artillery defenses that continuously pounded the enclosed Allies. A major seaborne supply route was established between Anzio and Naples over the next several months. As forces on both sides increased, Allied casualties rose to 59,000 men. One-third were lost from disease, exhaustion, and stress caused by severe battle fatigue and continuous rains.</p>	16
The Italian Campaigns	<p>Explain that the Allied force eventually grew to 90,200 Americans and 35,500 British, packed into a small beachhead. They were surrounded by 135,000 Germans who had placed their artillery so it could reach any part of the invasion site. It wasn’t until the rains ceased in May that the Allies finally broke the German hold on Monte Cassino, the key fortress on the Gustav Line, and surged northward. The Germans broke off all contact at Anzio when this happened, and the victorious Allies swept unopposed into Rome on 4 June.</p>	17-18
Check on Learning Questions A (Lesson questions 3-4)	<p>Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.</p>	19
Operation Overlord: The Invasion of	<p>Explain that two days later, the focus of attention in Europe became coastal France, where the great cross-Channel operation against Hitler’s Festung Europa (Fortress</p>	20

Chapter 8 / Section3: NS2-M1C8S3 – The Italian Campaigns

Normandy	Europe) began. The rest of the Italian campaign received little public attention. Nevertheless, the fighting continued as the Germans slowly but steadily retreated northward.	
Operation Overlord: The Invasion of Normandy	Explain that Hitler had calculated that the Allies would be invading his Festung Europa no later than the spring of 1944. He ordered the Commander on the western front, Field Marshal Karl von Rundstedt, and his Deputy, Field Marshal Rommel, to build a great “Atlantic Wall” of concrete fortifications to keep the Allies out. Von Rundstedt felt that static defenses were useless against Naval gunfire, so he organized highly mobile inland Divisions, which could rush to any spot where an invasion occurred.	21
Operation Overlord: The Invasion of Normandy	Explain that Rommel, on the other hand, felt that Allied air power would prevent the mobile divisions from getting to the seacoast. As a result, he concentrated his efforts on beach defenses, counting heavily on mines. He had also concluded that the Allies would most likely invade at the Normandy beaches, rather than at Calais, the English Channel’s narrowest point. Rommel was correct. The Allies had begun to prepare for a major amphibious invasion of the Normandy coast, about 170 miles southwest of Calais, under the code name Operation Overlord.	22-23
Operation Overlord: The Invasion of Normandy	Explain that in the early spring, Eisenhower began a strategic air attack against Germany designed to eliminate German aircraft factories and ruin the Luftwaffe. By April, the raids had decimated the German air force to the point that the Allies could count on a thirty-to-one superiority over the Normandy beaches. Next, the Allied air forces struck at the railroad marshaling yards, bridges, and the trains and tracks themselves, wreaking such havoc that it was almost impossible for any military traffic to move by rail anywhere in France. These air attacks assisted the amphibious assault. In fact, it was critical the Allied air strikes in France and Germany were effective if Operation Overlord was to be a success.	24-25
Operation Overlord: The Invasion of Normandy	Explain that the invasion at Normandy was originally planned for 1 May 1944, but Eisenhower postponed the date to 1 June in order to get an additional month’s production of landing craft. Explain that the physical conditions of tide, visibility, and weather all were of utmost importance to the planners. The tide was especially crucial. The tide had to be rising at the time of the initial landings, in order that the landing craft could unload and retract without becoming stranded. At the same time, the tide had to be low enough to expose sunken obstacles so underwater demolition teams could destroy them.	26-27
Operation Overlord: The Invasion of Normandy	Explain that the Allies finally selected one hour after low tide for the first landings. This meant that each succeeding wave of boats would come in on higher tides, with less beach to cross. Only three successive days each month would provide the desired tidal heights. The closest dates to 1 June were 5, 6, and 7 June. Eisenhower selected 5 June as his first choice for D-Day (Debarcation Day), and then chose H hours (times for operations to begin) from 0630 to 0755 for the best tidal conditions for each beach.	28
Operation Overlord: The Invasion of Normandy	Explain that the landings took place on 6 June 1944—a day later than planned due to bad weather, which would have limited air support. In commemoration of the event, this date has been memorialized as “D-Day” ever since. Explain that the principal objective of the landings, beyond establishing the beachhead itself, was to capture the port city of Cherbourg so the enormous flow of supplies could be quickly handled.	29

Chapter 8 / Section3: NS2-M1C8S3 – The Italian Campaigns

Operation Overlord: The Invasion of Normandy	Explain that the Allies planned to land on five beaches located between the Cotentin Peninsula and the mouth of the Orne River, near the city of Caen. The Americans were to land at Omaha and Utah Beaches on the right flank, and the British were to hit Gold, Juno, and Sword on the left flank.	30
Operation Overlord: The Invasion of Normandy	Explain that the U.S. Navy's tasking came under Operation Neptune, the amphibious assault and gunfire support elements of Operation Overlord. Explain that Operation Neptune was the landing phase of Operation Overlord. It took place on Utah Omaha, Gold, Juno, and Sword beaches.	31-32
Operation Overlord: The Invasion of Normandy	Explain that Rear Admiral Alan G. Kirk commanded the Western Task Force in the assigned American sectors of "Utah" and "Omaha" beaches.	33
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	34
Operation Overlord: The Invasion of Normandy	Beginning on 5 June, mine-sweepers were the first of over 6,900 vessels from many nations to support Operation Neptune. Repaired after the Pearl Harbor attack, the <i>USS Nevada (BB-36)</i> was among the 1,213 naval combat ships providing bombardment support. Explain that the U.S. Navy landed 73,000 assault forces on Utah and Omaha beaches.	35-36
Operation Overlord: The Invasion of Normandy	Explain that the 83-foot cutters <i>USCG 20</i> and <i>USCG 21</i> were two of 60 Coast Guard cutters that served as rescue craft off each of the invasion beaches. Explain that providing assault forces with additional equipment and material included off-loading directly on the beach and using prefabricated harbors, causeways, and piers developed by the Seabees.	37
Operation Overlord: The Invasion of Normandy	Explain that two artificial harbors, known as Mulberry A and Mulberry B, allowed large ships to dock and off-load in deeper water, thus increasing the delivery of supplies and reinforcements.	38
Operation Overlord: The Invasion of Normandy	Explain that minor opposition was encountered at Utah, Gold, Juno and Sword beaches, but severe opposition was encountered on Omaha Beach where Germans were well dug in. Landings were fiercely opposed and the Allies had heavy casualties.	39
Operation Overlord: The Invasion of Normandy	Explain that many German troops were directed inland to counter Allied paratroops who had dropped beyond the beaches for precisely that reason.	40
Operation Overlord: The Invasion of Normandy	Explain that the Allied troops consolidated their beachhead while expanding south and west to cut off Cherbourg on the Cotentin Peninsula. By the twenty-fourth the 40,000 Germans in Cherbourg were surrounded. A U.S. Naval force of battleships, cruisers, and destroyers was called in to pound the heavily fortified Cherbourg into submission. The Germans put up a determined counterbattery fire. The battleships prevailed, but not before three destroyers and the battleship <i>USS Texas</i> were hit. On 25 June, the Germans surrendered 40,000 troops at Cherbourg, and the Allies began the salvage of the wrecked harbor. The harbor was back in commission and receiving cargo within two weeks.	41-43

Chapter 8 / Section3: NS2-M1C8S3 – The Italian Campaigns

Review Question	The Review Question is, “What were some of the tasks handled by the Seabees in the battles discussed today?” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	44
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	45
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	46

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handouts for in class and take home activity

When: At the end of the lesson

- Have the cadets complete the in class activity

B. Take Home Activity: Operation Overlord was the invasion of France which began June 6th, 1944. The planners were very concerned with the weather, sea state and tides. Have the cadets list 4 meteorological or oceanographic considerations for the selection of the invasion date and describe why they were important to the success of Operation Overlord.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 8 / Section3: NS2-M1C8S3 – The Italian Campaigns

Activity 1: In-Class Activity – The Italian Campaigns

Name: _____ Date: _____ Class: _____

On 9 July 1943, the Allies invaded Sicily in Operation Husky. Who were the British and American Commanders in this Operation? How were they involved?

What tactic paved the way for allied troops to land and at the same time, reduced the effectiveness of the German counter attack?

How much of the Axis forces and equipment was able to escape to mainland Italy? How did they escape?

Briefly describe the results of Operation Husky.

Chapter 8 / Section3: NS2-M1C8S3 – The Italian Campaigns

Activity1: Take Home Activity – The Italian Campaigns

Name: _____ Date: _____ Class: _____

Operation Overlord was the invasion of France which began June 6th, 1944. The planners were very concerned with the weather, sea conditions and tides. List 4 meteorological or oceanographic considerations for the selection of the invasion date and why these considerations were important to the success of Operation Overlord.

1. _____

2. _____

3. _____

4. _____

Chapter 8 / Section 4: NS2-M1C8S4 – D-Day and Operation Anvil

(Section 4 of 4)

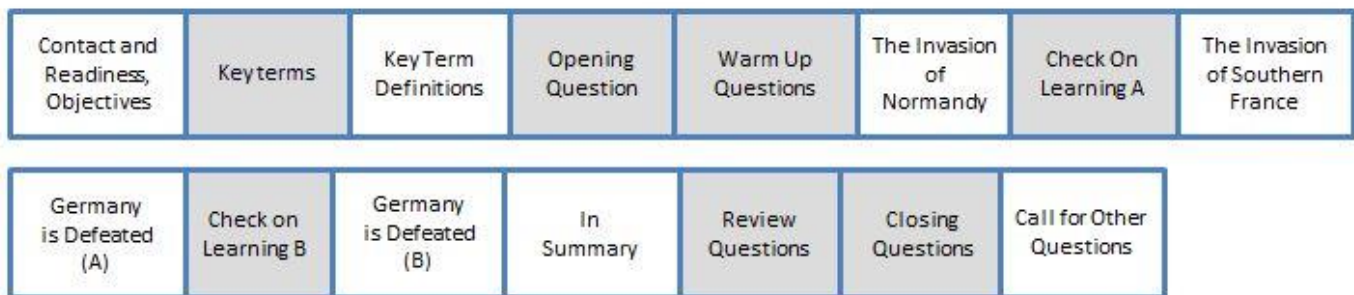
What Students Will Learn to Do:

Demonstrate an understanding of Naval history of World War II: The Atlantic War, 1941 – 1945

Skills and Knowledge to be Gained:

1. Describe the major events of Operation Anvil: Invasion of Southern France
2. Describe the last few months in Europe before the German forces surrendered

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 8. Place a checkmark beside the NS2-M1C8S4 PowerPoint presentation, and these two CPS question deck files: NS2-M1C8S4 - Key Terms and NS2-M1C8S4 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 8 / Section 4: NS2-M1C8S4 – D-Day and Operation Anvil

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will discuss military campaigns that involved entire land, sea, and air areas that were directly involved in the war operation in Europe and the Atlantic. Operations like the Invasion of southern France, the Battle at Stalingrad, the Conference between Roosevelt and Churchill at Casablanca, the Invasions of Sicily, Italy, and Rome, D-Day in Normandy, and finally, the surrender of Germany. Remember, this was a World War and as these battles were being waged in Europe and the Atlantic, there was also fighting in the Pacific.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Describe what is meant by the German U-boat wolf-pack tactic. “ Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on D-Day and Operation Anvil.	6
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	7
The Invasion of Normandy	Explain that throughout the Normandy invasion, the single most deadly weapon used by the Germans was the mine. The Germans had planted every kind of mine in the seas off Normandy. They planted contact mines, which exploded upon impact; magnetic mines, detonated by the magnetic fields of steel ships, and pressure mines, which were set off by ships passing over them.	8-9
The Invasion of Normandy	<p>Explain that the Allies used nearly 400 minesweepers to try to clear these mines in the days prior to the landings. Nevertheless, over 30 ships were sunk by mines during the invasion, and others were sunk in succeeding weeks as they ferried supplies across the Channel.</p> <p>Explain that despite the mines and the German resistance ashore, the Allies advanced.</p>	10
The Invasion of Normandy	Explain that taking advantage of a weak spot in the German lines found by General Omar Bradley’s First Army, General Patton drove through with the U.S. Third Army,	11-13

Chapter 8 / Section 4: NS2-M1C8S4 – D-Day and Operation Anvil

	creating a major breakout and trapping 50,000 German troops. On 24 August, Paris fell and General Eisenhower assumed command of the Allied ground forces on the continent. The Germans were in full retreat. A new, Free French government under Charles de Gaulle replaced what was left of the Vichy regime.	
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	14
The Invasion of Southern France	Explain that only one more invasion remained to be staged in the European theater. Operation Anvil was to take place on the French Riviera near Marseille. The operation had two objectives. One, to gain another port for supplies flowing into France and second, to serve as a diversion drawing German forces away from the primary beaches in Normandy. The landing was delayed until 15 August because of a shortage of landing craft.	15-16
The Invasion of Southern France	Explain that Admiral Hewitt was given the opportunity to conduct this first daylight landing in the Mediterranean. The assault was preceded by 1,300 bombers, which pounded the German defenses for nearly one and a half hours, and by over half an hour of heavy Naval shore bombardment. The landing craft moved in under a canopy of rockets fired by amphibious ships. The rockets, Naval gunfire, and bombing eliminated German resistance, and Free French and American forces quickly took the offensive. Within two weeks they had captured the port of Marseille, the Naval base at Toulon, and the Riviera cities of Nice and Cannes. The Allies then surged northward through the Rhône Valley, joining with Patton's forces on 12 September near Dijon. Most of France, Belgium, and Luxembourg had been liberated, and the Germans were settling in behind their west wall, the Siegfried Line. Through the summer and fall of 1944, complete control of the air allowed the Allies to move rapidly through France.	17-19
Germany is Defeated	Explain that the rapid movement of Allied forces through France was made possible mainly because of the complete control of the air. When winter weather arrived, the air cover was reduced because of poor flying conditions. On 16 December von Rundstedt launched a major counteroffensive, named the Battle of the Bulge, in the Ardennes area of Belgium.	20
Germany is Defeated	Explain that the Nazis made quick advances through a break in the U.S. lines before being stopped by massive attacks on their flanks by Allied armies. The Germans had surrounded elements of the U.S. 101st Airborne Division at the Belgian town of Bastogne. After several days of fierce fighting, the German commander demanded that the cutoff Americans surrender. The American commander, Brigadier General Anthony C. McAuliffe, gained instant and lasting fame for himself and his troops when he sent back one of the most eloquent replies in the annals of military history: "Nuts!" The terrible siege was broken on 27 December when the U.S. Third Army, led by General George Patton, broke through the German lines. The Battle of the Bulge was Germany's last offensive.	21-22
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	23
Germany is Defeated	Explain that in early 1945, the Allies, comprised of Americans, British, French, and Canadians on the western and Italian fronts, and the Soviets on the eastern front, resumed their attacks on the German Reich. In March the Allied forces reached the Rhine River, and the U.S. Navy was called on to make its last direct contribution in the fight against Germany. Navy landing craft, which had been carried across Belgium by trucks and trains, helped ferry elements of Bradley's armies over the river in most of their initial crossings.	24

Chapter 8 / Section 4: NS2-M1C8S4 – D-Day and Operation Anvil

Germany is Defeated	Explain that the Battle of the Bulge was the largest land battle of World War II in which the U.S. participated. This battle was fought by 600,000 Germans, 500,000 Americans and 55,000 British. Each country suffered a great number of casualties. Germany suffered a 100,000 loss, including casualties, wounded, or captured soldiers.	25
Germany is Defeated	Explain that the Navy's last direct contribution to the defeat of Germany was to provide landing craft to ferry Bradley's armies over the Rhine river.	26
Germany is Defeated	Explain that then, on 7 March, the First Army captured the Ludendorff Bridge at Remagen, and established a major bridgehead across the Rhine. The bridge held up for ten days under heavy German artillery fire. This was sufficient time for major forces to cross the river. The final push commenced from the west, while the Russians surged toward Berlin from the east. On 25 April, U.S. and Soviet forces met at the Elbe River. They had cut Germany in half from west to east. Three days later, Mussolini was captured and killed by Italian partisans while trying to escape to Switzerland dressed as a German soldier.	27-28
Germany is Defeated	Explain that on 30 April 1944, Adolf Hitler named Admiral Dönitz as his successor, then committed suicide in a bunker in Berlin.	29
Germany is Defeated	On 7 May 1945, hostilities ceased in Europe. The representatives of the German Army, Navy, and government signed the unconditional surrender document at Eisenhower's headquarters in a little red schoolhouse in Reims, France. France was quick to celebrate the victory. The date, 8 May 1945 became known as V-E Day (Victory in Europe). This was the day that the treaty was ratified in Britain. After five years, eight months, and six days of death and destruction, World War II was over in Europe.	30-33
In Summary	<div> <div>14 June 1940</div> <div>France falls to Germany</div> </div> <div> <div>7 Dec. 1941</div> <div>Japan bombs Pearl Harbor</div> </div> <div> <div>8 Nov. 1942</div> <div>Allies invade North Africa</div> </div> <div> <div>9 July 1943</div> <div>Sicily attacked</div> </div> <div> <div>9 Sept. 1943</div> <div>Italy invaded</div> </div> <div> <div>22 Jan. 1944</div> <div>Anzio landing</div> </div> <div> <div>4 June 1944</div> <div>U-505 captured</div> </div> <div> <div>6 June 1944</div> <div>D-Day at Normandy</div> </div> <div> <div>24 Aug. 1944</div> <div>Allies liberate Paris</div> </div> <div> <div>16-27 Dec. 1944</div> <div>Battle of the Bulge</div> </div> <div> <div>7 May 1945</div> <div>World War II ends in Europe</div> </div>	34-35
Review Question	The Review Question is, "What were the German buzz bombs, and how were they used?" Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	36
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	37
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	38

Chapter 8 / Section 4: NS2-M1C8S4 – D-Day and Operation Anvil

III. Supplemental Activities -

A. In Class Activity:

Supplies required: In class and Take home handouts

When: At the end of the lesson

- Have the cadets complete the handout D-day and Operation Anvil

B. Take Home Activity: Using the handout “Battle of the Atlantic”, have the cadets write a paper describing the roles in which the U.S. Navy participated during the Battle of the Atlantic.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 8 / Section 4: NS2-M1C8S4 – D-Day and Operation Anvil

Activity 1: In-Class Activity – D-Day and Operation Anvil

Name: _____ Date: _____ Class: _____

Mines were the most deadly weapon used by the Germans during the invasion of Normandy.

What makes mines such effective weapons?

Explain how mines work.

Chapter 8 / Section 4: NS2-M1C8S4 – D-Day and Operation Anvil

Activity1: Take Home Activity – Battle of the Atlantic

Name: _____ Date: _____ Class: _____

Directions: Using correct grammar and punctuation, write a paper describing what roles the U.S. Navy had during the Battle of the Atlantic. Give examples and details in your explanation.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

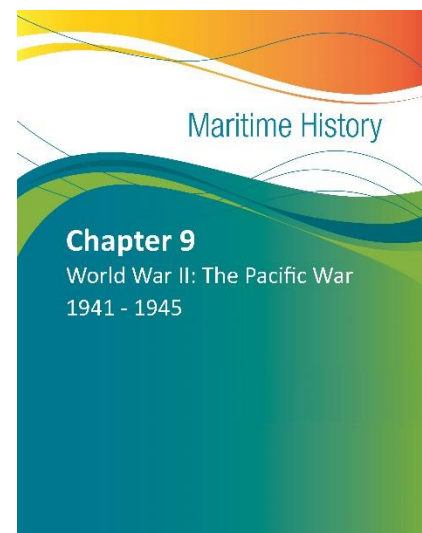
Module 1 Chapter 9: NS2M1C9 – World War II: The Pacific War

What Students Will Learn to Do:

Demonstrate an understanding of naval history of World War II: The Pacific War, 1941 – 1945

Skills and Knowledge to be Gained:

1. Explain the events that led up to the Japanese attack on Pearl Harbor
2. Describe the state of U.S. military readiness during and after the attack on Pearl Harbor
3. Explain three miscalculations the Japanese made during and following the attack on Pearl Harbor
4. Describe the spread of Japanese control
5. Describe Japan's Pacific perimeter of defense
6. Explain the use of U.S. intelligence in establishing a limited offensive to counter major Japanese moves
7. Cite two reasons the Battle of the Coral Sea was important
8. Explain the significance of the Battle of Midway
9. Describe the battles of Guadalcanal
10. Explain the strategy of 1943: Continuous pressure
11. Explain the submarine war in the Pacific
12. Explain the importance of the operation: The Marianas Operation: Saipan
13. Describe the battle of the Philippines Sea
14. Describe the Allied invasion of the Philippines and its significance
15. Describe the condition of the Imperial Japanese Navy following Battles for Leyte Gulf
16. Describe the U.S. occupation of Iwo Jima and its logistic significance
17. Describe the battle of Okinawa
18. Explain the surrender of Japan as being a fight to the bitter end



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...
- RI.9-10.9. Analyze seminal U.S. documents of historical and literary significance...

Writing

- W.9-10.1. Write arguments to support claims in an analysis of substantive topics or texts...

Module 1 Chapter 9: NS2M1C9 – World War II: The Pacific War

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Civic and Political Institutions

- D2.Civ.3.9-12. Analyze the impact of constitutions, laws, treaties, and international agreements on the maintenance of national and international order.

Dimension 2. Geography

- D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them.
- D2.Geo.5.9-12. Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.
- D2.Geo.12.9-12. Evaluate the consequences of human-made and natural catastrophes on global trade, politics, and human migration.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...
- D2.His.14.9-12. Analyze multiple and complex causes and effects of events in the past.

Dimension 4. Communicating Conclusions and Taking Informed Action

- D4.1.9-12. Construct arguments using precise and knowledgeable claims, with evidence from multiple sources...
- D4.2.9-12. Construct explanations using sound reasoning, correct sequence, examples, and details with significant and pertinent information and data...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

Module 1 Chapter 9: NS2M1C9 – World War II: The Pacific War

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 9 / Section 1: NS2-M1C9S1 – Pearl Harbor

(Section 1 of 5)

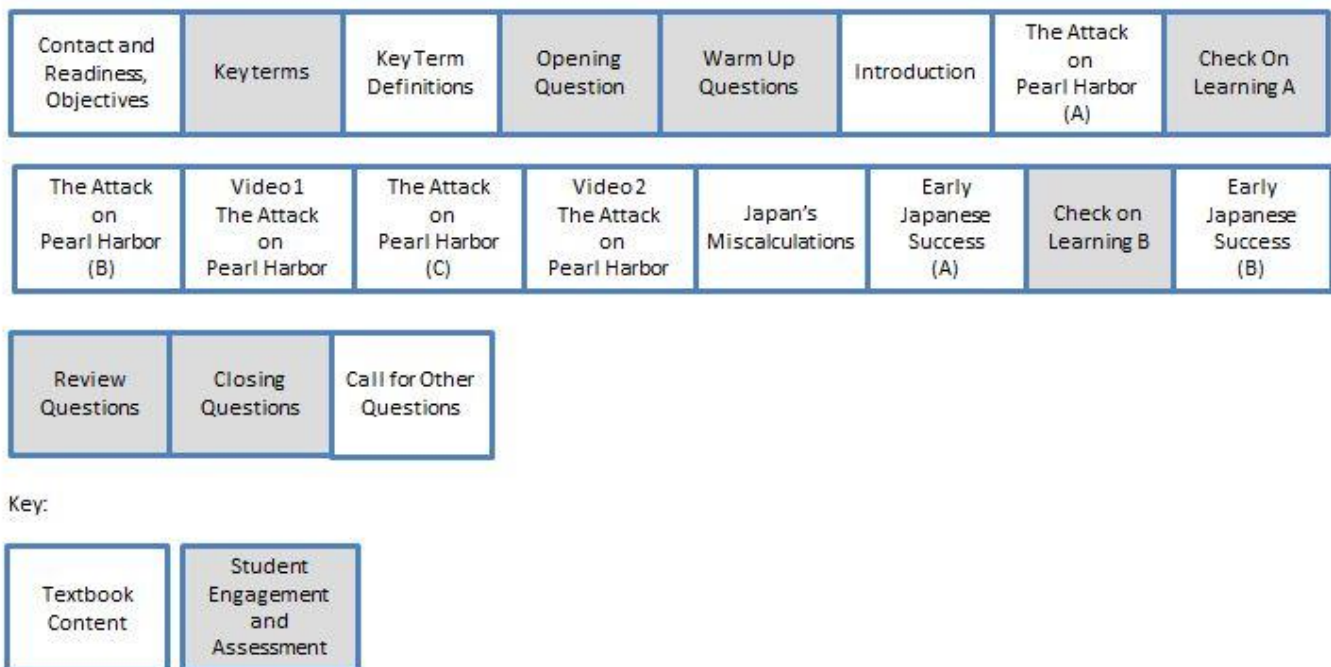
What Students Will Learn to Do:

Demonstrate an understanding of Naval history in the Pacific War from 1941 – 1945

Skills and Knowledge to be Gained:

1. Explain the events that led up to the Japanese attack on Pearl Harbor
2. Describe the state of U.S. military readiness during and after the attack on Pearl Harbor
3. Explain three miscalculations the Japanese made during and following the attack on Pearl Harbor
4. Describe the spread of Japanese control

LESSON FLOW OUTLINE



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 9. Place a checkmark beside the NS2-M1C9S1 PowerPoint presentation, and these two CPS question deck files: NS2-M1C9S1 - Key Terms and NS2-M1C9S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 9 / Section 1: NS2-M1C9S1 – Pearl Harbor

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>So far, our discussion on World War II has been limited to the Atlantic and European Theaters. However, today we will begin a journey into the Pacific. In this lesson we will discuss the events that led to the war in the Pacific and the Navy's role in World War II. Of course, many things led up to the war, but what was the specific event that drew the U.S. into the war? As our author said, "The fires had not even been extinguished at Pearl Harbor before the U.S. Navy began to make both short- and long-term plans for the future conduct of the war against the Japanese."</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5
Opening Question(Random Pick a Student – "RPS")	<p>This Opening Question is, "List 2-3 specific reasons why the element of surprise would be significant in an attack." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on the Pacific war.</p>	6
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	7
Introduction	<p>Explain that the following were significant events in the 1930's which lead to Japan's war with United States:</p> <p>1931 – Japan invaded Manchuria</p> <p>1932 – Japan Prime Minister is assassinated</p> <p>1933 – Japan resigned from the League of Nations</p> <p>1936 – Japanese ministers of finance, education, and interior are assassinated.</p> <ul style="list-style-type: none"> – FDR is re-elected – Japan renewed war against China 	8-9

Chapter 9 / Section 1: NS2-M1C9S1 – Pearl Harbor

	<p>1937 – U.S. proposed quarantine on “aggressor” nations – U.S. sent aid to China</p> <p>1939 – Japan entered 6-month undeclared war with Russia over border of Mongolia-Manchuria – Japan soundly defeated with heavy losses – Japan abandoned “Northern” expansion, adopted “Southern” expansion plan in Asia</p>	
Introduction	<p>Explain that Russia used blitzkrieg tactics, with massive armor and air superiority. Japan suffered heavy losses within their 60,000 troops, with 18,000 killed and 20,000 wounded.</p>	10
Introduction	<p>1940 – French, British and Dutch were under attack in Europe and unable to protect colonial assets in Southeast Asia – Japan joined Tripartite pack with Germany and Italy – Japan seized Northern French Indochina with Vichy government permission – U.S. cancelled trade agreements – U.S. embargoed high grade metals – U.S. ordered Pacific Fleet to remain in Hawaii indefinitely</p>	11
Introduction	<p>July 1941 – Japan invaded Southern French Indochina – U.S. froze Japanese assets in U.S. – U.S. denied Japan’s use of Panama Canal – U.S. embargoed scrap metal, aviation fuel and oil</p> <p>Oct 1941 – Japan demanded release of assets in the U.S. – U.S. demanded Japanese forces leave Indochina and China</p>	12
Introduction	<p>Explain that, in response to Japanese expansion into Indochina, the United States restricted the sale of oil to Japan in July 1941. This was done in response to Japanese expansion into Indochina and forced the Japanese to find an alternative source of oil. The Dutch East Indies were the only possible source of supply in the western Pacific region. Thus, American strategists reasoned that a Japanese military move into the Indies would be their next logical step. To deter such a move, President Roosevelt had directed that the battleships and aircraft carriers of the U.S. Pacific Fleet be based at Pearl Harbor, Hawaii. In October, the civilian government of Japan fell and was replaced by a military government headed by General Tojo. In November, a special Japanese envoy arrived in the United States to assist the Japanese ambassador in negotiations to resume the flow of western oil.</p>	13-15
Introduction	<p>Explain that “Magic” was the name given by the Americans to the breaking of the Japanese high-level Naval and diplomatic code. The machine named “Purple” was used to crack Japan’s code purple encrypted messages.</p>	16
Introduction	<p>Explain that, unknown to the Japanese the United States had an advantage in the negotiations because American code breakers had some months earlier succeeded in breaking the Japanese diplomatic code. Thus, Washington knew that a deadline for the negotiations had been set for late November, after which something ominous would take place. In late November, a Japanese Naval expeditionary force was sighted heading toward the Malay Peninsula, where they presumably would launch an invasion. But unknown and undetected, another Japanese force was at sea. This one, which included all six of Japan’s large carriers and numerous escort ships, was headed east across the Pacific toward Pearl Harbor, Hawaii.</p>	17-18
Introduction	<p>Explain that the carriers in the second task force included:</p> <ul style="list-style-type: none"> • <i>Akagi</i> 	19

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	<ul style="list-style-type: none"> • <i>Kaga</i> • <i>Kiryu</i> • <i>Soryu</i> • <i>Shokaku</i> • <i>Zuikaku</i> 	
The Attack on Pearl Harbor	Explain that masked by stormy seas and heavy rain, the Japanese strike force had approached to within 200 miles north of Oahu, Hawaii, by the early morning of Sunday, 7 December.	20
The Attack on Pearl Harbor	Explain that because of a threat of subversive activity, most American aircraft at the air base at Pearl Harbor on Oahu had been lined up in neat rows to guard against sabotage. The eight battleships of the Pacific Fleet were all anchored at Battleship Row in the harbor to permit weekend liberty. Fortunately, the two carriers <i>Lexington</i> and <i>Enterprise</i> , then stationed at Pearl Harbor, were out delivering planes to Midway and Wake Islands.	21-22
The Attack on Pearl Harbor	Explain that at 0600, the six carriers of the Japanese strike force turned into the wind and launched over 180 planes to attack the battleships and destroy the parked aircraft insuring that there could be no counterattack.	23
The Attack on Pearl Harbor	Explain most sailors and airmen spent Sunday mornings eating breakfast, relaxing, getting ready for church – so they were caught by complete surprise with the attack. The Japanese had pre-designated targets and struck Pearl Harbor, Ewa, Hickam and Kaneohe Bay simultaneously.	24
The Attack on Pearl Harbor	Explain that at 0800 the first of the attacking Japanese planes reached the harbor and radioed back the signal “Tora . . . Tora . . . Tora,” a code word meaning complete surprise had been achieved.	25
The Attack on Pearl Harbor	Suddenly, death and destruction began raining from the skies. Within moments, the battleship <i>Arizona</i> exploded and sank after a bomb set off her ammunition magazines. 1,777 Sailors were killed.	26
The Attack on Pearl Harbor	Show pictures of, ‘Flying Fortress at Hickman Field’, the ‘Vindicator at Marine Corps Air Station’ and ‘Post-Attack at Kaneohe Bay on December 8, 1941’.	27-29
Check on Learning Questions A (Lesson questions 3-4)	Check in on student’s understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	30
The Attack on Pearl Harbor	Soon, all remaining battleships were sunk or badly damaged. By 0945, the attack was over. In total, some 2,400 American servicemen had been killed and another 1,200 had been wounded. Nineteen ships had been sunk or severely damaged, including all eight battleships. Over 230 planes had been destroyed on the ground.	31
Video 1 on the Attack on Pearl Harbor	Show video 1 on the attack on Pearl Harbor	32
The Attack on Pearl Harbor	Explain that fortunately for the United States, a large tank farm near the harbor containing some 4.5 million barrels of oil was spared. Loss of this oil would have hindered later American naval operations even more than the damage done to the ships. Also, important repair yards and machine shops, which would make possible the eventual salvage and return to duty of fourteen of the nineteen ships disabled by the attack, were virtually untouched.	33-34
Video 2 on the	Show video 2 on the attack on Pearl Harbor	35

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Attack on Pearl Harbor		
Japan's Miscalculations	Explain that in accordance with the "Axis" Tripartite Pact signed on 27 September, 1940, Germany and Italy joined Japan in declaring war on the United States.	36
Japan's Miscalculations	<p>Explain that despite the attack's apparent success at the time, the Japanese had made three serious miscalculations. First, they had counted heavily on the efforts of twenty submarines deployed in the area and five midget submarines launched for the attack. However, as far as it is known, none of the midgets reached their targets, and the other submarines were not able to successfully interdict the sea-lanes between California and Pearl Harbor.</p> <p>Explain that second, rather than demoralize their American enemy, as had the sneak attacks on their Chinese foes in 1894 and the Russians in 1904, the attack on Pearl Harbor roused and infuriated the American public in general, and the U.S. Navy in particular, as nothing else could have. Third, and perhaps most importantly, the attack forcibly altered the mind-set of the senior American Naval leadership, which had until then believed that the dominant ships in Naval warfare would be battleships.</p>	37
Japan's Miscalculations	<p>Explain that Japanese Admiral commented after Pearl Harbor:</p> <p><i>"I fear that all we have done is awaken a sleeping giant, and fill it with a desire for vengeance."</i></p>	38
Japan's Miscalculations	Explain that after Pearl Harbor, the U.S. and its allies had no choice but to build their offense in the Pacific around the aircraft carrier. The Japanese held to a belief in the superiority of a battleship-centered strategy to the end. History would show that the carrier, not the battleship, would be the dominant Naval weapon of the Pacific in World War II, as it has been in all the major Navies of the world since that time.	39
Early Japanese Success	Explain that with the American fleet crippled in Pearl Harbor, the other parts of the Japanese master plan thrust into action. Japanese forces landed on the Malay Peninsula to begin their successful push toward the great British base at Singapore. The Japanese took Thailand without resistance. Their planes bombed U.S. air bases in the Philippines, and Japanese troops landed on the U.S. territories of Wake Island and Guam and at British Hong Kong. All these would fall to the Japanese by year's end.	40-41
Early Japanese Success	<p>Explain that into the confusion of successive defeats in the Pacific came the new Commander in Chief of the Pacific Fleet, Admiral Chester W. Nimitz. Nimitz arrived at Pearl Harbor on Christmas Day and assumed command in a brief ceremony aboard a submarine on 31 December.</p> <p>Explain that Admiral King's first instructions to Nimitz were clear: (1) cover and hold the Hawaii-Midway line and maintain communications with the U.S. West Coast, and (2) maintain communications between the West Coast and Australia by holding a line drawn north to south from Dutch Harbor in the Aleutian Islands of Alaska, through Midway to Samoa, then southwest to New Caledonia and Port Moresby, New Guinea.</p>	42
Early Japanese Success	Explain that the order was to hold the line against any further Japanese advances. Available forces were to be sacrificed in delaying Japanese advances in the Dutch East Indies in order to hold that defense line. Forces would be sent to the Pacific to reinforce as they became available. Meanwhile, it would be necessary for the United States to make a major effort in the Atlantic in order to keep the sea-lanes open to Britain and thwart the massive German threat facing the British and Soviet allies.	43

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Early Japanese Success	<p>Explain that the fires had hardly been extinguished at Pearl Harbor in December 1941 before the U.S. Navy began to finalize both short- and long-term plans for the conduct of the war against the Japanese. The war in the Pacific was going to be primarily a Naval war, and planning had already taken place for the conduct of such a war. A contingency plan for an island-hopping campaign in the Pacific, called War Plan Orange, had been drawn up thirty years earlier by Naval planners at the Naval War College in Newport, Rhode Island. The plan had been thoroughly refined in the years since.</p> <p>Explain that given the orders to hold the line of defense across the mid-Pacific and to protect the sea-lanes to Australia, Admiral Nimitz knew his task would be grim for the first months as small Allied Naval forces fought a delaying action in the Dutch East Indies. Fortunately, after that, there was no question in his mind that the U.S. Navy would have to take the offensive.</p>	44
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	45
Early Japanese Success	<p>Explain the following significant events in regards to "War Plan Orange"</p> <ul style="list-style-type: none"> • 1898 - Philippines and Guam acquired as a result of Spanish-American War • 1908 - Initially developed by Army-Navy Joint Board as a plan to protect the Philippines • Revised and updated by Naval War College, Newport RI • 1941 version was WPO-3 last updated in 1938 • Based on the premise of Japanese attack and early successes • Response would be a Navy-led war, island hopping to recover Philippines and force Japanese to suffer 	46-47
Early Japanese Success	<p>Explain that WPO gained importance as Japan:</p> <ul style="list-style-type: none"> • 1898-1914: Expressed strong anger over anti-Oriental laws passed in the U.S., particularly in California • 1918: Gained Pacific Island territories from Germany at the close of WWI (Marshalls, Marianas, the Carolines) *Note: Japan was a WWI ally • 1920s and 30s: Became increasingly militaristic 	48
Early Japanese Success	Explain that the Japanese moved quickly following their attack on Pearl Harbor. Within days they made landings in the Philippines to guard the sea-lanes of communications to their main objective, the oil of the Dutch East Indies. By mid-December they made their first landings near the oil fields on the island of Borneo, followed by an advance southward toward Java, the main island of the archipelago. Java was especially rich in the natural resources that Japan needed.	49
Early Japanese Success	Explain that in January 1942, the ABDA (American, British, Dutch, and Australian) defense command was formed. Its headquarters was in Java. The ABDA was never very effective because of the small forces at its disposal and disagreements over what it should do. The Dutch considered defense of Java the principal goal. The British and Americans believed that a successful defense of Java was impossible. The best ABDA could do was delay the Japanese so they could not move their forces farther into the Southwest Pacific and isolate Australia. The Japanese methodically moved through the Indies, setting up airfields for land-based air support at each succeeding location they conquered.	50-52

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Early Japanese Success	Explain that in mid-February Admiral Nagumo's carrier striking force arrived in the area. It raided Darwin, Australia's northernmost port, and supported an invasion of Portuguese Timor, thus effectively isolating Java from any major reinforcement.	53
Early Japanese Success	Explain the Battle of Java Sea took place 27 Feb-1 March 1942. Explain that the ABDA Naval force under command of Dutch Admiral Karel Doorman, made several attempts to stop the Japanese advance but was defeated in almost every encounter. The Battle of the Java Sea on 29 February all but eliminated the Allied force. The majority of ABDA ships, including the cruiser <i>USS Houston</i> , was sunk by aircraft and destroyer-fired torpedoes. They made several attempts to stop the Japanese advance. They were defeated in most encounters and Admiral Doorman was killed in battle.	54
Early Japanese Success	Explain that because the new British carrier, <i>HMS Indomitable</i> had been run aground in Jamaica en route to Java, there was no ABDA air cover. The war was fought at night. Explain that the Japanese began landing on Java on 28 February 1942. By 9 March, the island was forced into unconditional surrender. Before the end of March, the entire Dutch East Indies were in Japanese hands and the rich oil wells of Java, Borneo, and Sumatra were providing the Japanese with an inexhaustible supply of fuel and other resources. The Japanese had attained all their objectives in the south, and at the same time, they had conquered Burma and the Andaman Islands in the Indian Ocean. They had driven the battered British Indian Ocean Fleet into East African ports. The Japanese had accomplished all their primary objectives in less than half the time they had planned, and with insignificant losses.	55-57
Early Japanese Success	Explain that on 11 March, two days after the fall of Java, General Douglas MacArthur was ordered out of the Philippines by President Roosevelt. He slipped away from his command post on Corregidor in Manila Bay on a PT boat and made his way to the southern Philippines. From there he flew to Australia to take command of the defense of that nation. As he left the Philippines, he promised the Filipinos, in his now-famous words, "I shall return." In April and May the last Filipino and American defenders of the Philippines were overrun on Bataan Peninsula and Corregidor. The survivors suffered every form of human brutality as they were forced on a "Death March" from Bataan to their prison camps.	58-59
Early Japanese Success	Explain that the Bataan Death March included extreme malnutrition and disease from months of siege. Bad planning by the Japanese, along with deliberate and arbitrary cruelty, killed thousands of the almost 75,000 American and Filipino prisoners of war.	60
Early Japanese Success	Explain that during the March, only 54,000 prisoners reached the camp; between 7,000 and 10,000 died on the way and the rest escaped into the jungle. They were forced to march 65 miles without food, water or adequate rest. Those that fell behind were brutally slain: bayoneted, shot, buried alive - or unable to move, they were driven over by passing trucks and tanks.	61
Review Question	The Review Question is "In terms of human rights, what was significant about the Bataan Death March?" Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	62
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	63

Chapter 9 / Section 1: NS2-M1C9S1 – Pearl Harbor

Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	64
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III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handouts in class and take home activities

When: at the end of the lesson

- Have the cadets complete the handout about the Pearl Harbor attack.

B. Take Home Activity: Have the cadets use the take home handout Pearl Harbor and fill in the table with the information pertaining to each ship that was at Pearl Harbor on Dec 7, 1941

IV. Evaluation - see CPS database for chapter test questions.

Chapter 9 / Section 1: NS2-M1C9S1 – Pearl Harbor

Activity 1: In-Class Activity – Pearl Harbor Attack

Name: _____ Date: _____ Class: _____

What reaction did the Japanese expect from the American people after the attack on Pearl Harbor? (Think about the reaction of people in nation's attacked by the Japanese before Pearl Harbor.) Why did they make this assumption? What was the American people's reaction and how did it impact the war effort?

The U.S. was fortunate in that several critical installations were not attacked at Pearl Harbor. Name 2 of them and include what made them critical.

Chapter 9 / Section 1: NS2-M1C9S1 – Pearl Harbor

Activity1: Take Home Activity – Pearl Harbor

Name: _____ Date: _____ Class: _____

The 8 battleships at Pearl Harbor on Dec 7, 1941 are listed below. Fill in the table with the information pertaining to each ship:

Ship	Casualties: Wounded &/or Killed	Damages	Took Part in WWII after the attack? (Yes/No)
Arizona			
California			
Maryland			
Nevada			
Oklahoma			
Pennsylvania			
Tennessee			
West Virginia			

Chapter 9 / Section 2: NS2-M1C9S2 – Japanese Defense Perimeter

(Section 2 of 5)

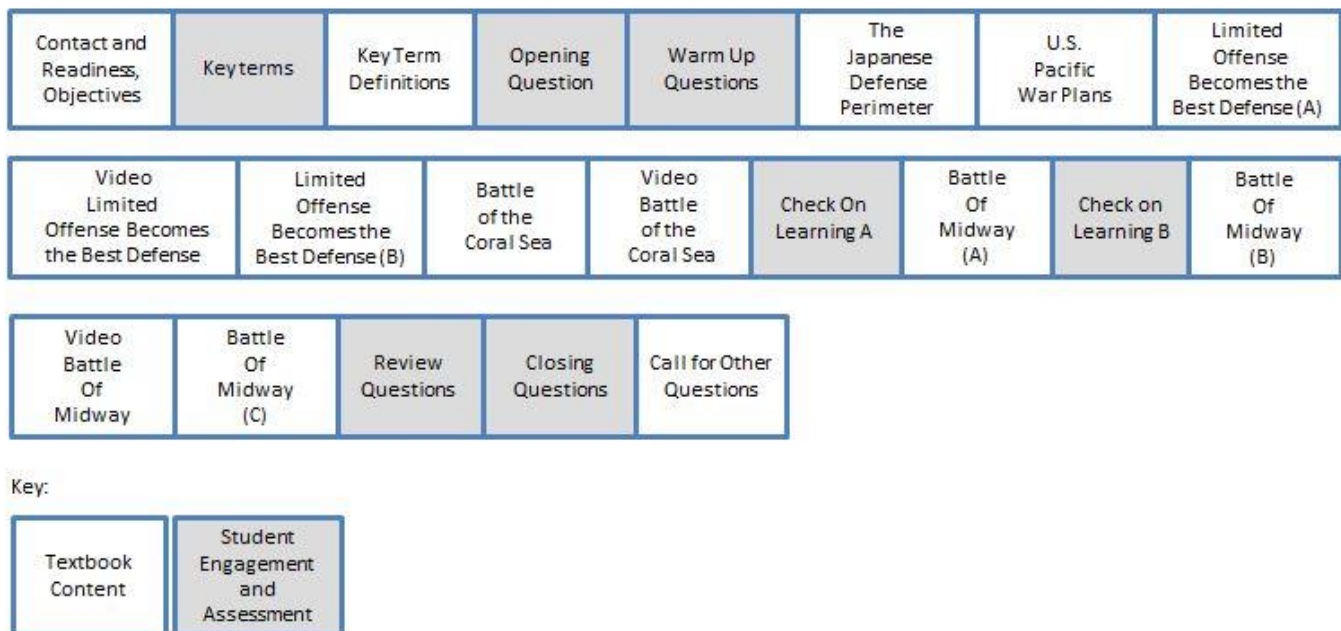
What Students Will Learn to Do:

Demonstrate an understanding of Naval history in the Pacific War from 1941 – 1945

Skills and Knowledge to be Gained:

1. Describe Japan's Pacific perimeter of defense
2. Explain the use of U.S. intelligence in establishing a limited offensive to counter major Japanese moves
3. Cite two reasons the Battle of the Coral Sea was important
4. Explain the significance of the Battle of Midway

LESSON FLOW OUTLINE



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 9. Place a checkmark beside the NS2-M1C9S2 PowerPoint presentation, and these two CPS question deck files: NS2-M1C9S2 - Key Terms and NS2-M1C9S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 9 / Section 2: NS2-M1C9S2 – Japanese Defense Perimeter

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will talk about how Japanese control spread throughout the Pacific. We will also look at the “gap” in the Japanese defense perimeter. We will discuss how U.S. intelligence gave Admiral Nimitz “one up” on the Japanese, the strategy of U.S. air raids on the Japanese homeland, and the Battle of the Coral Sea.</p> <p>The Battle of the Coral Sea was a significant “first” in Naval history. We’ll talk about what that first was, why it was important and additionally how the Japanese advance was turned back as a result. We will discuss the Battle of Midway—the turning point of the war in the Pacific. Following the Allied victory at the Battle of Midway, both Admiral Nimitz and General MacArthur thought it was time for a counter-offensive. The Solomon Islands became the objective of both the Allied and Japanese forces.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “List 2-3 reasons how intelligence communication can make or break a war.” Since this is a discussion question, it can be engaged using the RPS function where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the Japanese defense perimeter.	6
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	7
The Japanese Defense Perimeter	Explain that the Japanese had now established their defense perimeter. Anchored by Rangoon in the Indian Ocean area, their defense perimeter included all the Dutch East Indies and northern New Guinea on the south and included Rabaul on New Britain and Kavieng on nearby New Ireland to the southwest. It then crossed the Pacific northward to newly acquired Wake, Guam, and the British Gilbert Islands. On the northern flank, Japan was protected by bases in the Kurile Islands. Japan had also improved its many bases in the islands acquired from Germany during World War I—the Carolines, Marshalls, and Marianas. Japan made Truk in the Carolines into its “Pearl Harbor” of the central Pacific and developed Rabaul into a major forward base for further	8

Chapter 9 / Section 2: NS2-M1C9S2 – Japanese Defense Perimeter

	expansion southwestward. Only on the central perimeter, near Midway Island, did a gap exist. Admiral Yamamoto wanted to seal this gap, but the Japanese General Staff felt it was not necessary	
The Japanese Defense Perimeter	<p>Explain that the Japanese hoped that their string of well-defended bases and their fine Navy would be sufficient to keep the growing American strength at bay. The Japanese hoped to defeat newly arriving American forces bit by bit in a prolonged war of attrition. This, they hoped, would cause the American people to become disheartened and willing to make a compromised peace that would allow Japan keep her newly acquired territory. But Admiral Nimitz, the U.S. Navy, and the American people would not allow the Japanese achieve their hopes.</p> <p>Explain that even before the wartime buildup, Japan's industrial capability was 1/7th of that of the United States. Japanese strategy was for a short war with definitive sea battles before U.S. industrial strength could build.</p>	9 -11
U.S. Pacific War Plans	Explain that Admiral Nimitz knew that the Japanese were planning additional moves to the southwest. Unknown to them, the Japanese naval code had been broken by U.S. Naval Intelligence. Thus, on many crucial occasions throughout the war, Japanese plans were known ahead of time. This allowed successful countermeasures to be planned and executed. Nimitz felt that he could best defend the sea-lanes to Australia by attacking Japanese bases in the central Pacific with carrier task forces in a series of hit-and-run raids. This would cause much concern in the Japanese high command. Yamamoto himself was afraid that the Americans might even attempt a raid on Tokyo and endanger the emperor's life.	12
U.S. Pacific War Plans	Explain that Vice Admiral William Halsey was selected as the man to strike the Japanese bases. He was to conduct raids at widely separated locations so as to cause the Japanese the most anxiety. Halsey even hoped to make them believe that there were more U.S. Naval task forces in the region than they thought existed. Back home the press exaggerated the effects of the raids and greatly boosted American public morale, and so the raids achieved part of their purpose.	13
Limited Offense Becomes the Best Defense	Explain that then came an electrifying surprise U.S. attack on the Japanese home islands. In April 1942, Halsey's carrier striking force boldly sailed deep into Japanese waters with sixteen long-range Army B-25s lashed to the flight deck of the aircraft carrier <i>USS Hornet</i> . The plan was to launch the bombers on a one-way mission to the Japanese home islands as soon as the force approached within maximum range.	14
Limited Offense Becomes the Best Defense	Explain that on 18 April the all-volunteer pilots, led by Army Lieutenant Colonel James Doolittle, successfully took off when the force had come within 660 miles of Japan. They made air raids on Tokyo, Nagoya, and Kobe. None of the B-25s were lost over Japan. They then continued on into China, since they did not have sufficient fuel to return to the carrier. Once in China the pilots crash-landed or parachuted to the ground. Most escaped in friendly Chinese territory, though eight were captured and three were executed in Japanese-controlled areas.	15-16
Video on Limited Offense Becomes the Best Defense	Show video on limited offense becomes the best defense.	17
Limited Offense Becomes the Best Defense	Explain that the Japanese armed forces were humiliated. Their boast that the sacred territory of the Land of the Rising Sun would never be attacked was proven wrong. Yamamoto's plans to attack Midway in June in order to close the gap in the Japanese defense perimeter were now revived. Another Japanese move into the Coral Sea to cut the sea-lanes to Australia was put into action for early May. A third Japanese move, a	18

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	two-pronged thrust into the Solomon Islands and toward Port Moresby in New Guinea, also was initiated. Nimitz, aware of these intentions through decoding of Japanese messages, planned his own actions carefully.	
Battle of the Coral Sea	Explain that on 8 May the Battle of the Coral Sea was fought. It was the first great combat between carrier forces, with neither fleet ever coming into sight of the other. Both groups launched their attack waves at approximately the same time. Dive bombers and torpedo planes dropped their weapons on enemy ships while defensive planes and support ships fired on the enemy. Although the Americans had the “Magic” in knowing the enemy’s intentions, the Japanese also had several advantages: fliers with more combat experience, better torpedoes, and a storm front that partly concealed their movements. The opposing waves hit the two task groups almost simultaneously. The Japanese carrier <i>Shokaku</i> was severely damaged, and both the <i>Yorktown</i> and <i>Lexington</i> were hit. The <i>Lexington</i> was struck by two torpedoes, which ruptured her fuel lines and caused major explosions. The ship had to be abandoned and was later sunk by one of her own escorting destroyers.	19-22
Battle of the Coral Sea	Explain that the Battle of the Coral Sea turned back the Japanese advance for the first time in the Pacific war. Even though the American losses were somewhat greater, the strategic victory was clearly on the side of the United States. While only one Japanese carrier was sunk, another was damaged, and the third lost so many aviators it was kept out of the Midway operation. Nagumo’s Midway force would be short three carriers for the major action of Yamamoto’s grand plan. In all the Japanese lost 144 planes, 5,100 men, 1 carrier, 2 destroyers, 1 cruiser, 3 cargo ships and various small craft.	23
Battle of the Coral Sea	The strategic victory for the U.S. caused the invasion of Port Moresby to be cancelled. The victory stopped all threats against Australia and New Zealand and ended Japan’s expansion southward.	24
Video on the Battle of the Coral Sea	Show video on the battle of the Coral Sea.	25
Check on Learning Questions A (Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	26
Battle of Midway	Explain that in mid-1942 Yamamoto’s Combined Fleet had immense numerical superiority over Allied forces in the Pacific. However, Yamamoto devised a curious battle plan that split his forces into ten separate groups, spread all the way from the Aleutian Islands to Midway, itself. The Japanese Combined Fleet was a huge armada of eleven battleships, eight carriers, twenty-three cruisers, and sixty-five destroyers.	27
Battle of Midway	Explain that they were pitted against Nimitz’s small force of three carriers, eight cruisers, and fourteen destroyers. The key to the impending action, was U.S. intelligence. Nimitz had deduced all the major movements in the Japanese plan through radio intercepts and code breaking. The Americans were not going to be surprised—much to the astonishment of the Japanese. Naval Intelligence directed Midway to radio a fake message about a water shortage. When Japanese messages appeared reporting that “AF” was short of water, Naval intelligence confirmed it was Midway.	28-29

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Battle of Midway	Explain that the first action occurred on 3 June 1942, with a Japanese diversionary attack on Dutch Harbor in the Aleutians. Due to the U.S. intelligence forces knowing of the plan, the Navy did not respond to the feint. That same day a scout plane ranging 700 miles to sea from Midway alerted the Midway defenders to the presence of the Japanese carriers. RADM Fletcher drew his two task forces in to within 200 miles of Midway and waited. Nagumo launched his first attack of 108 planes against Midway at dawn on the fourth. Fletcher's patrol bombers located the Japanese force and he then ordered Rear Admiral Raymond Spruance on the <i>Enterprise</i> to attack while the <i>Yorktown</i> recovered the search planes	30-34
Battle of Midway	Explain that at the same time, all aircraft on Midway took off to attack the Japanese force. The American planes proved to be no match for the Zero fighters and were quickly shot down. Nagumo now was faced with four hours of fast action and difficult decisions. His carriers were successively attacked by torpedo planes and bombers, none of which scored a hit and almost all of which were shot down. Then, an American submarine penetrated his formation and fired torpedoes, all of which missed. Finally, the aircraft returning from the first Midway attack reported that another attack was needed to destroy the runways there. Bombs were loaded onto Japanese planes for the second attack.	35-36
Battle of Midway	Explain that at almost the same time, Nagumo received word of the American carrier task force. He changed course to approach it and ordered that the bombs that had been loaded on aircraft for the second Midway attack be replaced with torpedoes for an attack on the U.S. carrier force. The bombs were left lying on the deck. At the same time, the first Midway attack wave returned, and Nagumo ordered that the planes be recovered before launching the second wave.	37
Battle of Midway	Explain that Nagumo's force was now attacked by three low and slow waves of U.S. carrier torpedo planes, all of which were shot down in flames before they could score a hit.	38
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	39
Battle of Midway	Explain that their sacrifice would not be in vain. Nagumo had now turned back eight attacks in three hours without a scratch. But his luck had run out. As he was about to launch the counterattack, the four Japanese carriers turned into the wind. At that moment, another American wave of dive bombers from the <i>Enterprise</i> and <i>Yorktown</i> came screaming down in a high-altitude dive-bombing attack. They met almost no resistance from the Japanese combat air patrol, which had been pulled down to meet the previous American low-level torpedo attack. The Americans caught the Japanese carriers with planes on their flight decks about to take off, other planes refueling, and the off-loaded bombs lying around waiting to be returned to the magazines. American bombs hit the carriers <i>Soryo</i> , <i>Kaga</i> , and <i>Akagi</i> and turned them into flaming torches in minutes.	40-41
Battle of Midway	Explain that only the carrier <i>Hiryu</i> , farther north, escaped this attack. Her dive bombers followed the <i>Yorktown's</i> planes back and stopped the U.S. carrier with three hits. Additional hits by torpedo planes caused Fletcher to abandon his flagship and turn tactical command over to Admiral Spruance. Too damaged to continue the battle, the order was given to abandon the <i>Yorktown</i> .	42-43
Battle of Midway	Explain that about the time the <i>Yorktown</i> was being abandoned, her search planes discovered the <i>Hiryu</i> and reported her location and course. A short time later a wave of dive bombers from the <i>Enterprise</i> set the <i>Hiryu</i> on fire with four direct bomb hits. Yamamoto was now without aircraft carriers to protect his main body of heavy	44-45

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	warships. Though he ordered a counterattack during the night with four cruisers of his bombardment force, he canceled the Midway operation in the early hours of the morning rather than have his surface force exposed to a daylight dive-bombing attack. He ordered his entire force to retire to the west.	
Battle of Midway	Explain that the cruiser force now came under attack by a U.S. submarine, and in the process of dodging torpedoes, two of them, the <i>Mogami</i> and <i>Mikuma</i> , collided. On 6 June Spruance located the damaged ships and sank the <i>Mikuma</i> . The final action came when the <i>Yorktown</i> , which was under tow after being abandoned, was sunk by a Japanese submarine. The spread of torpedoes also sank an escorting U.S. destroyer.	46-47
Battle of Midway	Explain that the Japanese loss of four carriers and a cruiser was compounded by the loss of her best Japanese carrier pilots. This loss of pilots was one of the chief causes of Japan's ultimate defeat at sea. After Midway, new aviators sent to the carrier fleet were less prepared to face the growing number of well-trained American pilots.	48
Video on Battle of Midway	Show video on Battle of Midway	49
Battle of Midway	Explain that the Battle of Midway was the turning point in the Pacific war because of the major Japanese defeat at Midway, and limited Japanese success in Aleutians. Explain that only the Japanese northern forces had achieved success in Yamamoto's grand plan. They had succeeded in occupying Kiska and Attu in the Aleutian Islands without resistance. But from then on, the Japanese would never be able to launch a major offensive.	50
Battle of Midway	Explain that after the defeat of the Japanese at Midway, both Admiral Nimitz and General MacArthur believed that an Allied counteroffensive should be started while the enemy was still off balance. To the Japanese, the defeat indicated that they had to reinforce their advanced bases and bring ships and troops down to the southwestern perimeter of their defense line. The Solomon Islands thus became an objective of both sides.	51-53
Review Question	The Review Question is "List 2-3 reasons why the Japanese forces were disabled at the end of the Battle of Midway." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	54
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	55
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	56

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III. Supplemental Activities -

A. In Class Activity:

Supplies requires: none

When: After discussing the Doolittle Raid

- Have the class divide into 2 groups. Give them five minutes to discuss and prepare a quick presentation for the other half of the class.
 - Have one group discuss what the reactions of the Americans were to the success of the Doolittle Raid and how it impacted the American war effort.
 - Have the second group discuss the Japanese reaction to the Doolittle Raid.

B. Take Home Activity: Have the cadets complete the handout – Japanese Defense Perimeter

IV. Evaluation - see CPS database for chapter test questions.

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Activity1: Take Home Activity – The Japanese Defense Perimeter

Name: _____ Date: _____ Class: _____

What does “Magic” refer to in connection with WW II? How was it used? Give examples of at least 2 events where “Magic” played an important role and why.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Chapter 9 / Section 3: NS2-M1C9S3 – The Battles for Guadalcanal

(Section 3 of 5)

What Students Will Learn to Do:

Demonstrate an understanding of naval history in the Pacific War from 1941 – 1945

Skills and Knowledge to be Gained:

1. Describe the Battles of Guadalcanal
2. Explain the strategy of 1943: Continuous pressure
3. Explain the submarine war in the Pacific
4. Explain the importance of the operation: The Marianas Operation: Saipan
5. Describe the Battle of the Philippine Sea

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	The Battles of Guadalcanal	Check On Learning A	Strategy of 1943: Continuous Pressure
The Submarine War in the Pacific	Saipan	Check on Learning B	Battle of the Philippine Sea (A)	Video1 Battle of the Philippine Sea	Battle of the Philippine Sea (B)	Video2 Battle of the Philippine Sea	Review Questions
Closing Questions	Call for Other Questions						

Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 9. Place a checkmark beside the NS2-M1C9S3 PowerPoint presentation, and these two CPS question deck files: NS2-M1C9S3 - Key Terms and NS2-M1C9S3 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

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II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will discuss the Solomon Islands operations, the battles for Guadalcanal, and the invasion of New Guinea. We will look at the submarine operations in the Pacific and talk about how the Pacific operations differed from those against Germany in the Atlantic. The early battles paved the way for the invasion of the Philippines, where some of the bloodiest battles of the war were fought.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5
Opening Question(Random Pick a Student – “RPS”)	<p>This Opening Question is, “List 2-3 reasons why the Battle of Midway was considered the turning point of the Pacific War.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the battles for Guadalcanal.</p>	6
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	7
The Battles of Guadalcanal	<p>Explain that for the Japanese, this meant building an airfield on the Island of Guadalcanal so its aircraft could be used to cover their flank while they completed the conquest of New Guinea. For the Allies, it meant launching an operation to lessen the Japanese threat to the Australian sea-lanes, protecting Port Moresby on New Guinea, and establishing an advanced base from which to strike the Japanese base at Rabaul. All the earlier planning incorporated in War Plan Orange had proposed recapturing the Philippines, if lost, by a drive across the central Pacific. However, the Japanese threat to the sea-lanes of communication with Australia diverted much of the Allied effort to the south.</p>	8
The Battles of Guadalcanal	<p>Explain that when an American scout plane discovered the Japanese building the Guadalcanal airstrip, that the island became the focal point of a series of Naval battles and a prolonged struggle between U.S. Marines and Japanese forces for the next six months. A force of Marines landed on 7 August at Guadalcanal and nearby Tulagi. The seaway north of Guadalcanal used by the Allied task force staging the landings would become known as Ironbottom Sound because of the many ships sunk there during the campaign.</p>	9-10
The Battles of Guadalcanal	<p>Explain that within a few hours, the task force was under bombing attack from the Japanese base at Rabaul. After driving off the air attack, the U.S. carriers <i>Saratoga</i>, <i>Wasp</i>,</p>	11-12

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	and <i>Enterprise</i> retired because of heavy fighter-plane losses and the need for refueling. What the Allied force did not know was that a major Japanese naval force of cruisers was heading for the amphibious ships. They were coming down “the Slot,” the passage between the major Solomon Islands from Rabaul.	
The Battles of Guadalcanal	Explain that it was now that the Japanese surface training in night operations would pay off for them. Catching the U.S. and Australian surface force completely unaware off Savo Island, Vice Admiral Gunichi Mikawa’s cruisers gave the U.S. Navy the worst defeat it has ever suffered in battle: the U.S. cruisers <i>Astoria</i> , <i>Vincennes</i> , and <i>Quincy</i> plus the Australian cruiser <i>Canberra</i> were sunk, and the cruiser <i>Chicago</i> and two destroyers were heavily damaged. One thousand Allied sailors were killed.	13
The Battles of Guadalcanal	Explain that with the Allied surface force shattered and the carriers away from the scene, the amphibious task force was forced to withdraw, leaving 16,000 U.S. Marines on Guadalcanal without support and supplies. Only because the Japanese had no significant force ashore were the Marines able to capture the airfield, which they renamed Henderson Field, and set up a defense perimeter. By 20 August the Seabees had the field in operation and the first planes were flying sorties and bringing in supplies.	14
The Battles of Guadalcanal	Explain that when the Japanese learned that the Americans were repairing the airfield on Guadalcanal, they realized that they had to try to recapture that field. They began pouring troops onto the island at night, bringing them down the Slot by fast transports and destroyers with such regularity that the Marines called the enemy ships the “Tokyo Express.” Explain that Japanese submarines were stationed at the approaches to Guadalcanal, and by early September, they had sunk the <i>USS Wasp</i> , damaged the <i>USS Saratoga</i> , and torpedoed the new battleship <i>North Carolina</i> . Japanese forces continued to be heavily reinforced despite terrible casualties. By 15 October, 22,000 troops were ashore.	15-16
The Battles of Guadalcanal	Explain that night naval battles and attacks by the Japanese Combined Fleet wreaked havoc on American forces. But the Marines held, and they inflicted ten casualties for each one of their own men lost. Then, in the Battle of the Santa Cruz Islands on 24 October, Admiral Halsey gambled his carriers—and came out the loser. The <i>Hornet</i> was sunk and the <i>Enterprise</i> heavily damaged, leaving no operational U.S. carriers in the Pacific. In the process, however, two Japanese carriers and a cruiser were badly damaged and a hundred Japanese planes were shot down.	17-18
The Battles of Guadalcanal	Explain that the Naval Battle of Guadalcanal was now about to begin. On 12 November, the Japanese started down the Slot with 11,000 troops jammed into eleven transports. Escorted by two battleships as well as many cruisers and destroyers, this was to be the last major attempt by the Japanese to relieve their army on Guadalcanal. In a night cruiser action, the American and Japanese naval forces clashed head-on in the darkness, with heavy losses sustained on both sides. Seven of the Japanese transports with 9,000 troops were sunk.	19
The Battles of Guadalcanal	Explain that another night naval battle of Guadalcanal was fought in late November, again resulting in severe damage to U.S. cruisers by Japanese “long lance” (very long-range) torpedoes. But the Tokyo Express was slowly fading, and resupply of Japanese troops on the island was becoming more difficult. Extremely heavy casualties were inflicted on troop reinforcements by destroyers and PT boats. Guadalcanal and Henderson Field held. The Japanese gave up efforts to reinforce, and the remaining Navy battles occurred while trying to supply or withdraw ground forces.	20

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The Battles of Guadalcanal	Explain that five brothers from the Sullivan family of Waterloo, Iowa had enlisted in the U.S. Navy and were serving aboard the light cruiser <i>Juneau</i> . All were killed when the <i>Juneau</i> was sunk in this naval battle. A destroyer, the <i>USS The Sullivans (DD-537)</i> was named in tribute to the brothers, becoming the first U.S. Navy ship named after more than one person.	21-22
The Battles of Guadalcanal	Explain despite vastly superior forces, the U.S. lost one cruiser with three more badly damaged by eight Japanese transport destroyers. The Japanese used “long-lance” torpedoes, an oxygen-powered weapon that could deliver a 1,000 pound warhead at 49 knots over 11 miles (very long range). However, the Japanese could not win a war of ship attrition. U.S. destroyers and PT boats were inflicting heavy losses on Japanese troop reinforcements and transports. To the Marines’ satisfaction, the “Tokyo Express” was slowing down. The Marines who were ashore continued their hard-fought advance, pushing the Japanese into the jungle interior.	23-25
Check on Learning Questions A (Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	26
Strategy of 1943: Continuous Pressure	Explain that finally, on 9 February 1943, the Japanese slipped out of the jungle and 12,000 half-starved survivors made an escape on fast destroyers. Guadalcanal was secured. Explain that a consolidation and planning period took place following the success on Guadalcanal and other successes on New Guinea. Events in Europe dictated that it would be mainly up to U.S. forces, assisted when possible by Australian and New Zealand (ANZAC) forces, to prosecute the war in the Pacific against the Japanese.	27
Strategy of 1943: Continuous Pressure	Explain that the program put into effect for the rest of 1943 and early 1944 called for the elimination of the Japanese outposts in the Aleutians, intensified submarine attacks on the Japanese lines of communication from the Indies, and the isolation of Rabaul, with MacArthur’s forces assisted by the South Pacific naval forces. A two-pronged advance across the Pacific would then follow, with the objective of reaching the Luzon (northern Philippines)–Formosa–China coast geographic triangle by late 1944. From there, attacks against the Japanese home islands could be launched. One line of advance would proceed across the central Pacific by way of the Gilberts, Marshalls, Marianas, the Carolines, and Palau toward the Philippines or Formosa, using naval forces commanded by Nimitz. The second line of advance would be across the Southwest Pacific via the north coast of New Guinea to the southern Philippines, using combined U.S. and Allied forces under the overall command of MacArthur.	28
Strategy of 1943: Continuous Pressure	Explain that in the early part of 1943, there was also hope that the Nationalist Chinese army and other Allied forces under Chiang Kai-shek, the Allied commander in the China theater, could fight their way through Burma to the Chinese coast as well. Later in the year, these hopes were abandoned when it became obvious that the poorly equipped and badly organized Chinese army would not be able to overcome the stiff resistance of Japanese occupational forces in the region.	29
Strategy of 1943: Continuous Pressure	Explain that the re-conquest of Attu and Kiska in the Aleutian Islands took place over the summer months of 1943. By August the Aleutians had been fully returned to American control, and they were never again threatened by the Japanese. Ground forces used in the attacks were redeployed to the central Pacific. Though some thought was given to establishing a third line of advance across the North Pacific via these islands, the Joint Chiefs finally decided that the foggy, cold North Pacific with its rocky islands was not suitable for such a major offensive.	30

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The Submarine War in the Pacific	Explain that the submarine war in the Pacific was, in many ways, a mirror image of the Battle of the Atlantic. In the Atlantic, it was the goal of German U-boats to interdict Allied shipping in order to strangle Britain, but in the Pacific the roles were reversed. It was the American submarines that attempted to gain a stranglehold against Japanese shipping. In this endeavor they were aided somewhat by the Pacific geography, where shipping lanes to Japan from their sources of supply in Malaya, Borneo, Sumatra, and Java were often located in narrow straits between islands. This made interdiction easier for American submarines than for their German counterparts in the Atlantic. To build up the numbers of submarines, they were mass-produced during the war by American shipyards, just as escort destroyers and <i>Liberty</i> and <i>Victory</i> merchant ships were. For the Pacific, specially designed big submarines, nearly twice the size of German U-boats, were developed to carry greater fuel and torpedo loads for long-distance patrols against the Japanese.	31-33
The Submarine War in the Pacific	Explain that the Japanese, on the other hand, never placed much emphasis on their submarine fleet. Making the situation worse for the Japanese was the fact that their antisubmarine operations were never very successful, either. Because of a general lack of escort ships, the Japanese were not able to adopt the convoy techniques that were so successful in the Atlantic against the German U-boats, and they never developed radar. Consequently, by mid-1943 Japanese merchant shipping losses to submarine attacks were very heavy. The essential raw materials could not be delivered from the Southern Resources Areas to support Japanese war industry or military forces.	34
The Submarine War in the Pacific	Explain that altogether in the Pacific war, U.S. submarines sank over 1,100 merchant vessels, totaling over 5 million tons. In addition, U.S. subs sank some 200 Naval ships. The submarine was in many ways the Naval weapon that won the war for the United States in the Pacific.	35
Saipan	Explain that June 1944 found U.S. forces engaged in arguably the greatest military effort in history. At the very time the Normandy landings were taking place in Europe, the United States was about to send a huge amphibious force against Saipan in the central Pacific. The mammoth task of projecting 127,000 troops on 535 ships some 3,000 miles from Pearl Harbor, and providing them with fast carrier task force support against the entire Japanese Fleet, was just as complex as the D-Day invasion in Europe.	36
Saipan	Explain that as the amphibious task force proceeded toward its objective, Army planes from the newly won bases in the Marshalls and Navy carrier planes from <i>Task Force 58</i> struck Japanese bases in the Marianas and in the Carolines. A bombardment by U.S. battleships began on 13 June. It continued until the fifteenth, when two Marine divisions crossed the coral reef through passages blasted by underwater demolition teams and hit the beaches.	37-38
Saipan	Explain that heavy casualties were sustained, but by the end of the day 20,000 Marines were ashore. Reinforcements were put ashore, and by 17 June the American offensive had captured the main airfield and begun to push the Japanese back. By this time the Japanese Combined Fleet was approaching the operating area, and Admiral Mitscher had to steam out to place himself between it and the forces on Saipan. Mitscher's primary orders were: "Capture, occupy and defend Saipan, Tinian and Guam."	39
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	40
Battle of the Philippine Sea	Explain that maneuvering went on for two days as the two forces searched for each other. Mitscher was always mindful of his primary orders: "Capture, occupy, and defend Saipan, Tinian, and Guam." On the afternoon of 18 June Admiral Ozawa's scout planes discovered <i>Task Force 58</i> . History records that he had a total of 32 scout planes in the air!	41

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Battle of the Philippine Sea	<p>Explain that Ozawa’s main body had 6 carriers surrounded by cruisers and destroyers in two circular formations. One hundred miles ahead of the main body was Vice Admiral Takeo Kurita with the main Japanese surface force of battleships and cruisers, and 3 carriers. Facing the Japanese Mobile Force of 9 carriers, 5 battleships, 13 cruisers, 28 destroyers, and 430 carrier aircraft was <i>Task Force 58</i> with 15 carriers, 7 battleships, 21 cruisers, 69 destroyers, and 891 carrier aircraft. From Japan, Admiral Toyoda radioed Ozawa that “the fate of the Empire depends on the issue of this battle; let every man do his utmost!”</p> <p>Explain that alerted to the impending attack, Mitscher and Spruance put more than 450 planes in the air to meet the challenge. New combat information centers with the latest radar equipment guided TF-58’s Hellcats to approaching enemy planes from advantageous altitudes and directions. The superbly trained American pilots, at peak efficiency after a year of successful combat experience, were ready for the battle.</p>	42-45
Battle of the Philippine Sea	<p>Explain that Ozawa had counted heavily on getting air support from the Marianas bases. He felt that this land-based air support would more than equalize the opposing task forces. Unfortunately for Ozawa, he did not know that only thirty operational planes remained after the devastating American raids made earlier, and that many of his carrier pilots had returned from previous operations defending other Japanese outposts from the advancing Americans sick with malaria. Not aware that the odds were heavily against him because of these factors, he moved to close with <i>Task Force 58</i>.</p>	46
Battle of the Philippine Sea	<p>Explain that in eight hours of furious air warfare, 330 Japanese planes were shot down in what historians came to call the “Marianas Turkey Shoot.”</p>	47
Video 1 on Battle of the Philippine Sea	<p>Show video 1 on Battle of the Philippine Sea</p>	48
Battle of the Philippine Sea	<p>At the same time, the American submarine <i>Albacore</i> torpedoed Ozawa’s new carrier flagship, the <i>Taiho</i>, and the submarine <i>Cavalla</i> put three torpedoes into the carrier <i>Shokaku</i>. Both carriers exploded a few hours later with great loss of life. But Ozawa and his staff survived and transferred to the carrier <i>Zuikaku</i>.</p>	49
Battle of the Philippine Sea	<p>Explain that Ozawa ordered a general retirement to refuel, intending to resume battle the next day—even though he had only 100 carrier planes left. He believed erroneous reports from his surviving pilots that <i>TF-58</i> had been crippled.</p> <p>Explain that Mitscher, in the meantime, had received no information on Ozawa’s movements and chose a course that separated the forces well beyond his optimum operating radius. Late the next day, a scout plane located the Japanese formation. Taking a calculated risk, Mitscher launched 200 planes against the Japanese when they were just within maximum operating range.</p>	50
Battle of the Philippine Sea	<p>Explain that then came a shock: the Japanese were 60 miles farther away than originally reported. Mitscher decided to let his planes continue, while steaming full speed toward the Japanese in order to reduce the return flight distance.</p> <p>Explain that just before sunset the Americans found the Japanese force and attacked it, sinking two oilers and a carrier and damaging two other carriers, a battleship, and a cruiser. Ozawa managed to get seventy-five of his fighters into the air. Only ten survived, and the crippled Mobile Fleet sailed away with only thirty-five planes left. Japanese naval air capability had been destroyed, and the Marianas invasion was able to continue, opposed only by the Japanese garrisons on the islands.</p>	51-52

Chapter 9 / Section 3: NS2-M1C9S3 – The Battles for Guadalcanal

Battle of the Philippine Sea	<p>Explain that during the night after the final engagement, Admiral Mitscher daringly turned on the carrier lights to guide back the returning pilots. Still, many planes were lost. They had to ditch in the sea when out of fuel. However, of 209 aviators who had engaged the enemy that day, all but 49 were recovered, either on the flight decks or from the water by destroyers and float planes.</p> <p>Explain that with the Mobile Force defeated and out of the area, <i>TF-58</i> was able to concentrate on providing full assistance to the invading forces on Saipan and succeeding invasions of Tinian and Guam. Now sustained shore bombardment could be brought to bear before the troops landed, greatly reducing casualties.</p>	53
Battle of the Philippine Sea	<p>Explain that both Saipan and Tinian were secured by the end of July, and organized resistance ceased on Guam by 10 August.</p> <p>Explain that Japan had lost her direct air route into the Carolines. The United States had acquired logistic bases for additional steps toward the Philippines, advance submarine bases for attacks on Japanese communications and sea-lanes to the Indies, and air bases from which the new long-range B-29s would soon be bombing the industrial cities of Japan.</p>	54
Video 2 on Battle of the Philippine Sea	Show video 2 on Battle of the Philippine Sea	55
Battle of the Philippine Sea	Explain that this was the beginning of the end for Japan. The emperor and other high officials now knew that they would have to surrender. The Tojo government fell and was succeeded by a cabinet to which the emperor made known his desire for early peace negotiations. But the Japanese military ethic was still so strong that no official would initiate steps to end the war for yet another year.	56
Review Question	The Review Question is, “Explain the principle effect of the Japanese defeat in the Battle of the Philippine Sea.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	57
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	58
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	59

Chapter 9 / Section 3: NS2-M1C9S3 – The Battles for Guadalcanal

III. Supplemental Activities -

A. In Class Activity:

Supplies requires: Handout for Take Home Activity

When: This activity can be done during or at the end of the lesson.

- Have the cadets participate in a class discussion about the difference between the objective of the German U-boat strategy in the Atlantic Theater and the American submarine force's objective in the Pacific Theater.

B. Take Home Activity: Have the Cadets complete the handout – The Battle of Guadalcanal.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 9 / Section 3: NS2-M1C9S3 – The Battles for Guadalcanal

Activity1: Take Home Activity – The Battle of Guadalcanal

Name: _____ Date: _____ Class: _____

During the Battle of Guadalcanal, an area called the “Slot” played a significant part. Using complete sentence and correct punctuation, describe how was the “Slot” used by the Japanese? What was the result of any battles between the Japanese and American Forces?

[illegible]

Chapter 9 / Section 4: NS2-M1C9S4 – Return to the Philippines

(Section 4 of 5)

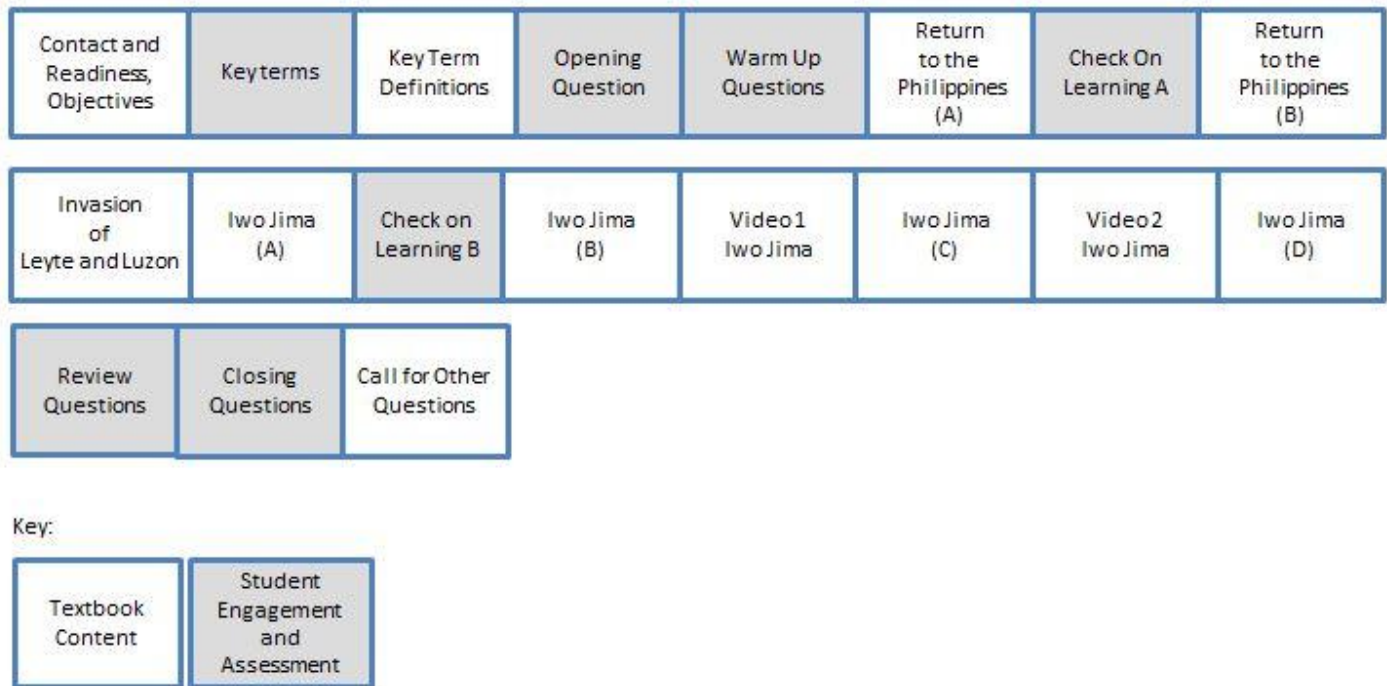
What Students Will Learn to Do:

Demonstrate an understanding of Naval history in the Pacific War from 1941 – 1945

Skills and Knowledge to be Gained:

1. Describe the Allied invasion of the Philippines and its significance
2. Describe the condition of the Imperial Japanese Navy following Battles for Leyte Gulf
3. Describe the U.S. occupation of Iwo Jima and its logistic significance

LESSON FLOW OUTLINE



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 9. Place a checkmark beside the NS2-M1C9S4 PowerPoint presentation, and these two CPS question deck files: NS2-M1C9S4 - Key Terms and NS2-M1C9S4 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 9 / Section 4: NS2-M1C9S4 – Return to the Philippines

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will discuss how the early battles paved the way for the invasion of the Philippines, where some of the bloodiest battles of the war were fought. We will look at the Battles of Leyte Gulf and discuss the strategy the Japanese used and why they eventually failed. We will talk about the battle of Iwo Jima and why logistically, it was so valuable to whoever occupied the island.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Explain the Doolittle Raid on Japan in April 1942.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the return to the Philippines.	6
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	7
Return to the Philippines	Explain that still following WPO-3, the next series of invasion plans had yet to be decided when Spruance and other senior Naval Commanders returned to Pearl Harbor to rest and plan their future operations. This included a return to the Philippines. The <i>Fifth Fleet</i> was redesigned the <i>U.S. Third Fleet</i> under Admiral Halsey, with Vice Admiral Mitscher remaining in command of the <i>Fast Carrier Task Force</i> , now called <i>Task Force 38</i> . The Military principles of maneuver, economy of force, surprise, and massing of force, were in play.	8-9
Return to the Philippines	Explain that in its two drives across the Pacific, the Allied forces had arrived in mid-September 1944 at the threshold of their strategic objective, the Luzon–Formosa–China coast triangle. In seven months, MacArthur’s forces had moved nearly 1,500 miles from the Admiralties to the island of Morotai. In ten months, Nimitz’s forces had advanced over 4,500 miles from Hawaii to the Palaus. The time had now arrived when a final choice had to be made of the main objective in the target area.	10
Return to the Philippines	Explain that knowing that the Palau Islands, Yap, and Morotai were probably the next objectives, Halsey joined <i>TF-38</i> in his flagship, the <i>USS New Jersey</i> , and carried out air strikes against the central Philippines. The results were astounding. <i>TF-38</i> destroyed	11-12

Chapter 9 / Section 4: NS2-M1C9S4 – Return to the Philippines

	200 enemy airplanes and sank a dozen freighters and a tanker. Convinced that the central Philippines were weakly defended, Halsey sent Nimitz an urgent message recommending that the Palaus and Yap be bypassed and that ground forces for these operations be turned over to MacArthur, at his urging, for an invasion of Leyte Island in the central Philippines.	
Return to the Philippines	Explain that until this time, there had been some indecision among the Joint Chiefs between Formosa and the Philippines as the objective of the central Pacific campaign, but now the choice seemed clear. Because of the weaknesses discovered by Halsey in the central Philippines, the Allies would follow his and MacArthur's advice and take the Philippines—first Leyte in October, then Luzon in December. Nimitz would then invade Iwo Jima and Okinawa early in 1945. The Joint Chiefs directed Nimitz and MacArthur to combine forces for the invasion of Leyte on 20 October 1944, after securing Morotai and Peleliu in the Palau Islands.	13
Return to the Philippines	Explain that three large carriers and 5 light carriers conducted the pre-assault “softening up” of Peleliu.	14
Return to the Philippines	Explain that Morotai was captured in one of the easiest conquests of the war. However, while the “softening up” bombardment was somewhat successful, overcoming Peleliu's defenses cost the Marines the highest combat casualty rate (40 percent) of any amphibious assault in American history. A new Japanese strategy was put into effect. The old strategy called for the defenders to meet the invasion on the beaches, but this obviously had not worked in the face of devastating shore bombardment.	15
Return to the Philippines	Explain that the new strategy called for a “defense in depth.” The defenders were to have prepared positions well behind the beaches, taking full advantage of the natural terrain. Resistant fortifications were to be constructed, and there were to be no useless “banzai” charges.	16
Return to the Philippines	Explain that more than 10,000 Japanese had carefully prepared Peleliu in accordance with the new strategy. After three days of naval bombardment, the Marines landed on Peleliu on 17 September and quickly made good their beachhead and captured the airfield. Then they ran into the interior defenses, and from then on progress was costly and slow. It was not until February 1945, that the island was cleared of Japanese defenders. By that time the Marines had suffered 10,000 casualties, including nearly 2,000 dead.	17
Return to the Philippines	Explain that long before February, the airfields and the anchorages in the Palaus were brought under American control. Had they remained in Japanese hands, they would have been a threat to the Leyte invasion and later operations in Luzon.	18
Return to the Philippines	Explain that in preparing for the Leyte invasion, the Third Fleet conducted heavy attacks on Formosa and Okinawa to destroy potential land-based air support for the Japanese forces in the Philippines. Just before the landings took place, they attacked Formosa again, destroying most of the torpedo bombers that had been sent from the home islands. Over 350 Japanese land-based aircraft were destroyed between 11 and 15 October. This ensured control of the air over the Leyte beaches.	19
Return to the Philippines	Explain that more than 60,000 assault troops were landed ashore on Leyte by sunset on D-Day, 20 October. From then on, it was a tough fight in the interior of the island. General MacArthur waded ashore a few hours after the first landing, accompanied by President Sergio Osmena of the Philippines. In a radio broadcast MacArthur announced his return to the islands and called for Filipinos to rise and strike the Japanese at every opportunity.	20

Chapter 9 / Section 4: NS2-M1C9S4 – Return to the Philippines

Return to the Philippines	Explain that by late December, MacArthur's Sixth Army had secured the most important sections of the island, that is, those required for air and logistical bases. Japanese troops in the mountains continued organized resistance well into the spring of 1945. While the fighting for Leyte continued, MacArthur's forces moved on to Luzon only slightly behind schedule. In mid-December two Army regiments captured an air base in southwestern Mindoro, 150 miles south of Manila.	21
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	22
Return to the Philippines	Explain that the invasion of Luzon itself started on 9 January 1945, when four Army divisions landed along the shores of Lingayen Gulf. Explain that the Japanese were incapable of Naval intervention at Lingayen Gulf, their most significant reaction being "kamikaze" (suicide plane) attacks against Admiral Kinkaid's supporting naval forces and Mitscher's fast carrier force, now redesignated <i>TF-58</i> . Army units reached Manila on 3 February. It took them a month of bitter building-to-building fighting to root out the Japanese. By mid-March, Manila Bay was open for Allied shipping. Except for a strong pocket of resistance in the mountains of central Luzon, organized Japanese resistance ended by late June 1945.	23-25
Invasion of Leyte and Luzon	Explain that between 23 and 26 October 1944, the Japanese made their greatest challenge to the Leyte landings. Admiral Toyoda knew that if the Japanese lost the Philippines they would lose everything. The lifeline between Japan and the Indies would be cut and the Mobile Fleet would be divided, without fuel and ammunition. The Fleet could then be defeated piece by piece and Japan would be blockaded. Toyoda knew he was outnumbered, but this would be the last chance for the Imperial Navy to stop the American advance. Accordingly, he directed nearly every Japanese warship still afloat to attack the enemy at Leyte.	26-28
Invasion of Leyte and Luzon	Explain that in the four-day action, there were four major battles: the Battle of the Sibuyan Sea on 24 October, and, on 25 October, the Battle of Surigao Strait, the Battle off Cape Engano, and the Battle off Samar. These battles were the largest and most complex naval engagements in history. When the battles were over, the Imperial Japanese Navy had lost most of its remaining carriers, plus most of its remaining surface forces.	29
Invasion of Leyte and Luzon	Explain that with the Japanese surface Navy ruined, its carriers sunk and pilots lost, the United States proceeded with the re-conquest of the Philippines. Eighteen amphibious assaults were conducted between the landings on Leyte and the final landings in March 1945 on the islands of Mindanao and Panay. It was during these actions at Leyte Gulf that another new threat appeared for the first time in the Pacific war—the "kamikaze" suicide planes. (The word kamikaze means "divine wind." This referred to a typhoon, which reputedly saved Japan in 1281 by destroying a Mongol fleet that was sailing to invade the islands.) From then on, until the Philippine Islands were secured, U.S. Naval forces suffered increasing damage and sinking from these planes. The worst of this type of attack was yet to come, however.	30
Iwo Jima	Explain that the conquest of the Marianas had provided bases for the large B-29 bombers to make devastating air raids on the Japanese industrial cities. However, between the Marianas and Japan was the volcanic island of Iwo Jima. As long as the Japanese held the island, the home islands' defenses were alerted when bombers were en route, and fighters were scrambled to intercept them.	31

Chapter 9 / Section 4: NS2-M1C9S4 – Return to the Philippines

Iwo Jima	Explain that the 3,000-mile round trip was much too far for Allied fighters to accompany and defend the bombers. Damaged bombers were often lost in the sea on the return trip because they would not hold up for that distance. The Americans determined to put an end to this dangerous situation.	32
Iwo Jima	Explain that in U.S. hands, the island's airfields could be improved to handle emergency landings for the big bombers and to provide a base for fighter planes to escort them over Japan. The Japanese, fully aware of the importance of the island to their defenses, expected an assault. They removed the civilians and reinforced the garrison to 23,000 troops. They proceeded to transform the island into the strongest fortress in the Pacific.	33
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	34
Iwo Jima	Explain that Iwo Jima was an 8-square-mile island of lava cut into hills and ravines and overlooked by 550-foot Mount Suribachi, an extinct volcano. The Japanese tunneled into the volcanic rock and made interconnecting passageways between 400 concealed pillboxes and concrete blockhouses. Their artillery was placed in caves on Mount Suribachi, where it could sweep the beaches.	35
Iwo Jima	Explain that when the invasion force arrived, heavy Naval bombardment on the island was able to be conducted for only three days of the ten requested by the Marines, because of the accelerated timetable decreed by the Joint Chiefs of Staff. This was to prove grossly inadequate.	36
Iwo Jima	Explain that D-Day at Iwo Jima was set for 19 February 1945. Five hundred landing craft carrying eight battalions of Marines moved to the line of departure. Meanwhile, more than a hundred of <i>TF-58's</i> planes attacked the island with rockets, machine guns, general purpose and napalm bombs. Naval guns shifted from slow, destructive fire to fast, neutralizing fire to drive the defenders underground. When the assault waves approached the beach, the support ships shifted fire again to provide a barrage of fire ahead and on the flanks of the advancing Marines. More than fifty rocket-firing amphibious ships advanced to give the Marines close support.	37
Iwo Jima	Explain that despite all this preparatory fire, the assault waves quickly piled up on the beach because the amphibian tractors were unable to climb the crumbling volcanic ash. Many landing craft broached (turned sideways in the surf) or ran into earlier boat waves. The Marines, stranded on the steep beach, soon were hit by withering machine-gun, mortar, and heavy gunfire from weapons that had withheld their fire earlier so they would not reveal their positions. Through this bombardment, the Marines inched forward, isolating Mount Suribachi and reaching the edge of the nearest airfield. Of 30,000 Marines who hit the beach on the first day, 2,400 became casualties.	38-39
Iwo Jima	Explain that the fighting continued through the night, and the next day the airfield was captured. The assault on Mount Suribachi then began. For three days there was blasting and burning out pillboxes and sealing up caves with grenades, flamethrowers, rockets, and demolition charges.	40
Video 1 on Iwo Jima	Show video 1 on Iwo Jima	41

Chapter 9 / Section 4: NS2-M1C9S4 – Return to the Philippines

Iwo Jima	Explain that the mountain was surrounded. A patrol reached the summit and raised the American flag. By a stroke of good fortune, the flag raising was photographed by a war correspondent. A greater than life-sized sculpture was later made from the photo and immortalized the moment. It has provided inspiration to the American people ever since. The sculpture is located in Washington, D.C."	42
Video 2 on Iwo Jima	Show video 2 on Iwo Jima	43
Iwo Jima	Explain that while the vicious fighting was in progress on Iwo Jima, the supporting Naval forces of <i>TF-58</i> and the <i>Amphibious Support Force</i> were hit by numerous "kamikaze" attacks. The carrier <i>Saratoga</i> was badly damaged, and the escort carrier <i>Bismarck Sea</i> sank after a tremendous explosion that blew off her stern.	44
Iwo Jima	Explain that instead of taking five days as originally planned, the conquest of Iwo Jima took over a month. It wasn't until 25 March that the last Japanese troops made their final attack. Only 200 Japanese were captured. The remainder were killed. For the first time, casualties among the assault forces exceeded those of the Japanese defenders. Over 19,000 Marines and sailors were wounded and nearly 7,000 were killed.	45
Iwo Jima	Explain that historians have described the U.S. forces attack against the Japanese defense as "throwing human flesh against reinforced concrete." There were no front lines. The Marines were above ground and the Japanese underground. The Marines rarely saw a live Japanese soldier but the Japanese could easily see the Marines. Explain that Admiral Nimitz said the Marines on Iwo Jima made "uncommon valor a common virtue."	46-47
Review Question	The Review Question is, "List 2-3 ways that the battle at Iwo Jima was different in terms of the way it was fought on the ground." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	48
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	49
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	50

Chapter 9 / Section 4: NS2-M1C9S4 – Return to the Philippines

III. Supplemental Activities -

A. In Class Activity:

Supplies requires: Handouts for In Class and Take Home Activities

When: at the end of the lesson

- Have the cadets complete the handout “Return to the Philippines”, describing the outcome of the Battles for Leyte Gulf. Have them also describe the new weapon employed by the Japanese. Was it effective? What was the downside, that is, the negative consequences of employing this weapon?

B. Take Home Activity: Complete the take home handout “Morotai and Peleliu”.

Answering the following questions:

1. What did the Japanese change that made overcoming Peleliu’s defenses cost the Marines the highest combat casualty rate (40%) of any assault in American history?
2. Why was Morotai and Peleliu considered important areas to be controlled by American Forces?

IV. Evaluation - see CPS database for chapter test questions.

Chapter 9 / Section 4: NS2-M1C9S4 – Return to the Philippines

Activity 1: In-Class Activity – Return to the Philippines

Name: _____ Date: _____ Class: _____

Directions: Using complete sentences and correct punctuation, describe the result of the Battles for Leyte Gulf. Describe the new weapon employed by the Japanese. Was it effective? What was the downside, that is, a negative consequence of employing this weapon?

[illegible]

Chapter 9 / Section 4: NS2-M1C9S4 – Return to the Philippines

Activity1: Take Home Activity – Morotai and Peleliu

Name: _____ Date: _____ Class: _____

Directions: Answer the following questions using complete sentences.

1. What did the Japanese change that made overcoming Peleliu's defenses cost the Marines the highest combat casualty rate (40%) of any assault in American history? Why were Morotai and Peleliu considered important areas to be controlled by American Forces.

2. Why were Morotai and Peleliu considered important areas to be controlled by American Forces?

Chapter 9 / Section 5: NS2-M1C9S5 – Battle of Okinawa

(Section 5 of 5)

What Students Will Learn to Do:

Demonstrate an understanding of Naval history of World War II: Pacific War from 1941 - 1945

Skills and Knowledge to be Gained:

1. Describe the battle of Okinawa
2. Explain the surrender of Japan as being a fight to the bitter end

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	The Battle of Okinawa (A)	Video The Battle of Okinawa	The Battle of Okinawa (B)
Check On Learning A	The Final Days (A)	Check on Learning B	The Final Days (B)	In Summary	Review Questions	Closing Questions	Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 9. Place a checkmark beside the NS2-M1C9S5 PowerPoint presentation, and these two CPS question deck files: NS2-M1C9S5 - Key Terms and NS2-M1C9S5 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 9 / Section 5: NS2-M1C9S5 – Battle of Okinawa

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will look at Okinawa, the last Japanese counterattack and the strategy used by the Japanese. Ending the war was not a simple matter for the Japanese even when they knew they had lost. We will talk about why. We will also look at the terms of surrender spelled out by the Potsdam Conference. Finally, we will discuss the introduction of atomic weapons into the war and talk about how Japan surrendered. We will discuss the effects of the atomic bomb on Hiroshima and Nagasaki.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5
Opening Question(Random Pick a Student – “RPS”)	<p>This Opening Question is, “What did the Japanese see as the consequence of losing the battles for Leyte Gulf?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the Battle of Okinawa.</p>	6
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	7
The Battle of Okinawa	<p>Explain that the war was now closing in on the home islands of Japan. From the middle of February, carrier aircraft began striking the Japanese cities with high explosives and incendiaries. On 25 February, even before Iwo was secured, fighters from <i>TF-58</i> supported 200 B-29s in a massive raid on Tokyo, burning out 2 square miles of the enemy capital and destroying 150 Japanese aircraft. Afterward, <i>TF-58</i> steamed past Okinawa, bombing the island’s airfields and taking intelligence photographs. The final gigantic amphibious assault and battle of the Pacific war was about to begin.</p>	8
The Battle of Okinawa	<p>Explain that weeks of heavy raids and softening-up attacks on Japanese bases on Kyushu and Okinawa preceded the assault landings on Okinawa. On 1 April, a force of 1,300 ships carrying 182,000 assault troops arrived off the island, having come from bases all over the Pacific. Over 100,000 Japanese defenders awaited their attack from well-prepared positions, as on Iwo Jima and Peleliu. The Japanese troops on Okinawa knew that they were the last obstacle to an Allied invasion of the Japanese home islands. Many had pledged to fight to the death to prevent the island from falling. From this point on, all elements of the invasion fleet were subject to fierce kamikaze attacks.</p>	9-11

Chapter 9 / Section 5: NS2-M1C9S5 – Battle of Okinawa

The Battle of Okinawa	Explain that on the morning of 6 April, however, the Japanese began their last major counterattack of the war. Over 350 Japanese kamikazes came out of Kyushu to strike the fleet.	12
Video on The Battle of Okinawa	Show video on the Battle of Okinawa	13
The Battle of Okinawa	Explain that meanwhile, the last surviving Japanese surface force, made up of the huge battleship <i>Yamato</i> , the light cruiser <i>Yahagi</i> , and eight destroyers, sailed south from the Inland Sea, propelled by the last 2,500 tons of fuel oil in Japan. It was to be a one-way trip, for both aircraft and ships. Since the ships did not have enough fuel to return, their mission was to drive through the invasion fleet, causing as much damage as possible. They planned to beach themselves at the invasion site, firing until all their ammunition was expended or until they were destroyed.	14-15
The Battle of Okinawa	Explain that the kamikazes sank several U.S. picket destroyers, but not before warnings had been radioed by the sinking ships. Met by combat air patrol fighters from <i>TF-58</i> , 150 planes were shot down. The remaining 200 made it to the Okinawa area.	16
The Battle of Okinawa	Explain that, for the most part, they were destroyed by fighter planes and intense anti-aircraft fire. Meanwhile, the <i>Yamato</i> force was allowed to proceed far enough southward so it would not be able to retreat to safety. Then Admiral Mitscher struck with the full force of his carrier aircraft. Only two destroyers survived the attack and made it back to base.	17
The Battle of Okinawa	Explain that for the next three months the carrier task forces and other ships of the U.S. Fifth and Third Fleets suffered hundreds of kamikaze attacks as they supported the Okinawa action and thrust their power into the Japanese home islands. On 21 June 1945, Okinawa was declared secure after the defending Japanese general, Lt. General Mitsuru Ushijima, and his chief of staff acknowledged defeat by committing suicide. During the battle for the island, the Navy had endured the loss of 68 ships and over 4,000 sailors—more than either the Marines or the Army had suffered in the hard going on the island.	18-20
The Battle of Okinawa	Explain that the U.S. Navy stayed, and Okinawa was secured. Overall U.S. losses were: 12,274 Dead, 36,707 Wounded, and 26,000 Non-battle casualties. At the same time, Japanese casualties were: 107,539 troops dead (out of 110,000), 7,000 airplanes and 140,000 civilians, (many at their own hand). Okinawa was the end of the fighting for the Japanese. Emperor Hirohito told his Supreme War Council on 22 June that they must find a way to end the war. Fire-bombing raids were turning Japanese cities into ashes, and their Navy and Air Force were gone.	21
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	22
The Final Days	Explain the Soviet Union had informed the Japanese that they would not renew their Neutrality Pact in April, and since Germany had surrendered in May, entrance of the Soviets into the Pacific war was imminent.	23
The Final Days	Explain that bringing an end to the war was not easy. There were still powerful factions in the Japanese military forces who favored a fight to the bitter end. The Japanese people would never accept a surrender that would not preserve the emperor and imperial system.	24
The Final Days	Explain that the Japanese made peace gestures to the Soviets during their negotiations for extension of the neutrality pact. Still, the Soviets remained silent—so silent that	25

Chapter 9 / Section 5: NS2-M1C9S5 – Battle of Okinawa

	Stalin did not reveal to the United States or Britain information about the peace initiatives during their late July meeting in Potsdam, Germany.	
The Final Days	Explain that the United States knew about the peace initiatives, however. U.S. intelligence was reading the messages between the Foreign Ministry in Tokyo and the Japanese ambassador in Moscow. On 26 July, the Potsdam Declaration spelled out the terms of surrender for Japan, specifying that unconditional surrender would pertain only to the military forces and their possessions with the exception of the four home islands—Hokkaido, Honshu, Shikoku, and Kyushu, that would have to be given up. No provisions concerning the emperor were made, since the Allies had not yet decided on this question. This omission caused much concern in Japan.	26-27
The Final Days	Explain that as the Soviets stalled and the Japanese procrastinated, the Americans and British were actively planning an invasion of the home islands of Japan, code-named Operation Downfall. Events were moving faster than governments. On 16 July, the United States successfully exploded the first atomic device at Alamogordo, New Mexico. Within hours, atomic bombs were en route to the Marianas bomber bases. During the next three weeks the combined U.S. and British fleets, the most powerful ever assembled in history, ranged freely up and down the Japanese coast, shelling and bombing cities virtually at will.	28
The Final Days	Explain that the USS <i>Indianapolis</i> (CA-35) carried bomb parts and enriched nuclear fuel to the island of Tinian in the Marianas. It was sunk while returning to Guam. The secret mission left sailors in the water for five days with oil and sharks – resulting in only 317 survivors out of 1200.	29
The Final Days	Explain that after a thorough assessment of projected casualties to both sides that could result from the planned invasion of Japan, versus the casualties and damage anticipated from dropping the atomic bomb, President Harry Truman decided to use the A-bomb in an attempt to end the war without the necessity of an invasion.	30
The Final Days	Explain that the Historian William Manchester wrote: “The capture of Iwo Jima, less than 8 square miles of volcanic ash, had cost 28,849 Marines...Okinawa’s price had been 49,151... “If the Japanese could draw that much blood in the outer islands of their defense perimeter, how formidable would they be on the 14,151 square miles of their 5 home islands...”	31
The Final Days	Explain that The first A-bomb was called “Little Boy”. It was 10 ½ feet long and weighed about 9,700 pounds. Explain that on 6 August 1945, a B-29 carrying an atomic bomb left Tinian and headed for Hiroshima, an industrial city on the Inland Sea. The weapon was dropped and utterly destroyed the city.	32-33
The Final Days	Explain that the Soviets then realized that the end had arrived and that they had to get into the Pacific war immediately if they were to participate in the victory. On 8 August, the Soviet Union declared war on Japan and moved its forces into Manchuria and Korea, sweeping the Japanese before them. Despite the destruction at Hiroshima and the dropping of leaflets warning of the consequences of further delay, the Japanese military elements in the government refused to consider unconditional surrender. Therefore, on 9 August another U.S. aircraft dropped a second atomic bomb on the industrial port of Nagasaki.	34-36
The Final Days	Explain that the second A-bomb was called “Fat Man”. It was over ten feet long and weighed 10,700 pounds. The plane, B-29 <i>Bock’s Car</i> was piloted by Major Sweeny. “Little Boy” was carried by B-29 <i>Enola Gay</i> and was piloted by Col. Tibbetts.	37-38

Chapter 9 / Section 5: NS2-M1C9S5 – Battle of Okinawa

Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	39
The Final Days	Explain that faced with this ultimate destruction, Emperor Hirohito advised his Supreme Council to accept the Potsdam Declaration. The cabinet agreed, but only on the condition that the imperial system remain. The U.S. Secretary of State, speaking on behalf of the Allied governments, accepted the condition subject to stipulations that the emperor must submit to the authority of the Supreme Allied Commander during the occupation of Japan, and the Japanese people should decide on the emperor's final status in free elections at a later date. The cabinet, on the advice of the emperor, agreed to these stipulations on 14 August. The next day, with one carrier raid already flying over Tokyo, the Third Fleet received the order to "cease fire."	40-41
The Final Days	Explain that in the next two weeks the Allies converged on Tokyo Bay. On Sunday morning, 2 September 1945, the Japanese foreign minister and representatives of the Imperial General Staff boarded the <i>USS Missouri</i> at anchor in Tokyo Bay and signed the surrender document on behalf of the emperor, the government, and the Imperial General Headquarters.	42-43
The Final Days	Explain that General Douglas MacArthur signed the acceptance as Supreme Allied Commander for the Allied powers. Fleet Admiral Chester Nimitz signed as the representative for the United States. Following him were representatives of the United Kingdom, China, the Soviet Union, Australia, Canada, France, the Netherlands, and New Zealand. Shortly thereafter, General MacArthur moved into his Tokyo headquarters to direct the occupation of Japan. World War II was over.	44-48
The Final Days	Explain that newspapers from around the country proclaimed the end of the war. V-J Day was proclaimed after the treaty had been signed.	49-53
In Summary	<p>July 1941 U.S. halts oil sales to Japan</p> <p>7 Dec. 1941 Japan bombs Pearl Harbor</p> <p>11 Mar. 1942 MacArthur leaves Philippines</p> <p>18 Apr. 1942 Doolittle raid on Japan</p> <p>8 May 1942 Battle of Coral Sea</p> <p>4 June 1942 Battle of Midway</p> <p>7 Aug. 1942 Marines land on Guadalcanal</p> <p>9 Feb. 1943 Guadalcanal secured</p> <p>Aug. 1943 Aleutians recaptured</p> <p>Mar. 1944 Rabaul bypassed</p> <p>15 June 1944 Saipan landing</p> <p>18 June 1944 Battle of Philippine Sea</p> <p>July 1944 New Guinea secured</p> <p>20 Oct. 1944 MacArthur invades Philippines</p> <p>23-26 Oct. 1944 Battle for Leyte Gulf</p> <p>19 Feb. 1945 Iwo Jima landing</p> <p>1 Apr.-21 June 1945 Battle of Okinawa</p> <p>6 Aug. 1945 Atomic bomb dropped on Hiroshima</p> <p>8 Aug. 1945 Soviets declare war on Japan</p> <p>2 Sept. 1945 Japan surrenders</p>	54-57
Review Question	The Review Question is, "List three events in August 1945 that made it imperative for Japan to accept the Potsdam Declaration." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	58

Chapter 9 / Section 5: NS2-M1C9S5 – Battle of Okinawa

Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	59
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	60

III. Supplemental Activities -

A. In class Activity:

Supplies required: Handouts for in class and take home activities

When: at the end of the lesson

- Have the cadets complete the handout “The Battle of Okinawa” by answering the following questions: What was the attitude/mission of the Japanese defenders on Okinawa? Did you think the vicious fighting with the Japanese defenders during the defense of Okinawa had any influence on President Truman’s decision to use the A-bomb? Why?

B. Take Home Activity: Have the cadets use the handout “USS Indianapolis” and write a paragraph describing what significant mission did the *USS Indianapolis (CA35)* take part in that contributed to the surrender of the Japanese? What happened to the *USS Indianapolis* after she completed her mission?

IV. Evaluation - see CPS database for chapter test questions.

Chapter 9 / Section 5: NS2-M1C9S5 – Battle of Okinawa

Activity 1: In-Class Activity – The Battle of Okinawa

Name: _____ Date: _____ Class: _____

Directions: Using complete sentences and correct punctuation, answer the following questions:

What was the attitude/mission of the Japanese defenders on Okinawa? Did you think the vicious fighting with the Japanese defenders during the defense of Okinawa had any influence on President Truman's decision to use the A-bomb? Why?

[illegible]

Chapter 9 / Section 5: NS2-M1C9S5 – Battle of Okinawa

Activity1: Take Home Activity – USS Indianapolis

Name: _____ Date: _____ Class: _____

What significant mission did the *USS Indianapolis (CA35)* take part in that contributed to the surrender of the Japanese? What happened to the *USS Indianapolis* after she completed her mission?

[illegible]

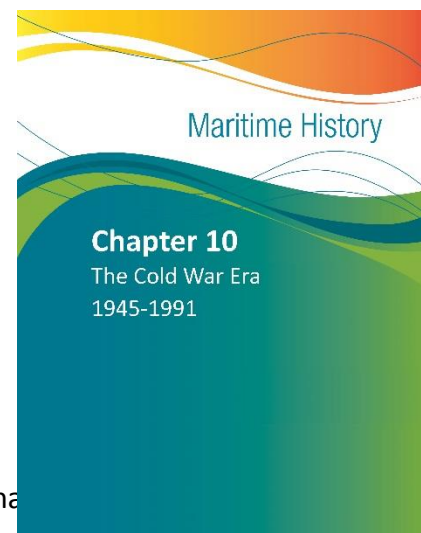
Module 1 Chapter 10: NS2M1C10 – The Cold War Era

What Students Will Learn to Do:

Demonstrate an understanding of naval history from the Cold War Era, 1945 – 1991

Skills and Knowledge to be Gained:

1. Describe the views and events during the demobilization periods
2. Describe the events leading to the Cold War
3. Explain postwar views and actions in relation to the unification of the armed services and provisions for national security
4. Describe the causes for implementation of the Truman Doctrine and the Marshall Plan
5. Describe the events leading to formation of the North Atlantic Treaty Organization (NATO)
6. Describe postwar activities in the Far East in regard to insurgencies, nationalism, and colonialism
7. Describe the events involved in the Breakout at Pusan
8. Describe the events involved in the Chinese Intervention within the Korean War
9. Describe the events involved in the dismissal of General Douglas MacArthur from all duties in the Far East
10. Describe the events involved in the Truce Talks of the Korean War exchange of prisoners
11. Describe naval confrontations in the post-Korean aftermath and how these confrontations related to the U.S. Navy
12. Describe the Navy's movement into the nuclear age
13. Describe major events in the Cuban missile crisis
14. Describe the major events which led to the breakup of Vietnam into North and South Vietnam
15. Describe the U.S. involvement in the Tonkin Gulf incident in August of 1964
16. Describe the U.S. expansion efforts in Vietnam in 1967
17. Describe the restrictions placed on military forces stationed in Vietnam
18. Describe the Vietnamization process established by the United States
19. Describe the major events that led to the end of the Vietnam War
20. Describe the events that were included in the Post-Vietnam Modernization efforts
21. Explain the significance of the 1972 Strategic Arms Limitation Treaty (SALT).
22. Describe the events that took led to the Falklands War of 1982
23. Describe the joint U.S. task force's role in Grenada during the fall of 1983



Module 1 Chapter 10: NS2M1C10 – The Cold War Era

24. Describe the role the United States played in restoring democracy to Panama and the importance of Operation Just Cause to U.S. interests in Panama
25. Describe the rise of terrorism worldwide with events in the Middle East during the 1980s
26. Describe the major events that occurred between Iran and Iraq in the Persian Gulf region
27. Describe the great changes experienced by the Soviet Union since 1985 and the rapid rise of the democratic movement within the Soviet Union after the demolition of the Berlin Wall

Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.5. Analyze in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text (e.g., a section or chapter).
- RI.9-10.6. Determine an author's point of view or purpose in a text...
- RI.9-10.9. Analyze seminal U.S. documents of historical and literary significance...

Writing

- W.9-10.1. Write arguments to support claims in an analysis of substantive topics or texts...
- W.9-10.7. Conduct short as well as more sustained research projects to answer a question or solve a problem...
- W.9-10.8. Gather relevant information from multiple authoritative print and digital sources...

Speaking & Listening

- SL.9-10.2. Integrate multiple sources of information presented in diverse media or formats...
- SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically ...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Civic and Political Institutions

- D2.Civ.3.9-12. Analyze the impact of constitutions, laws, treaties, and international agreements on the maintenance of national and international order.

Module 1 Chapter 10: NS2M1C10 – The Cold War Era

- D2.Civ.7.9-12. Apply civic virtues and democratic principles when working with others.
- D2.Civ.9.9-12. Use appropriate deliberative processes in multiple settings.

Dimension 2. Geography

- D2.Geo.2.9-12. Use maps, satellite images, photographs, and other representations...
- D2.Geo.12.9-12. Evaluate the consequences of human-made and natural catastrophes on global trade, politics, and human migration.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...
- D2.His.5.9-12. Analyze how historical contexts shaped and continue to shape people's perspectives.
- D2.His.16.9-12. Integrate evidence from multiple relevant historical sources and interpretations into a reasoned argument about the past.

Dimension 3. Gathering and Evaluating Sources

- D3.1.9-12. Gather relevant information from multiple sources ...
- D3.4.9-12. Refine claims and counterclaims attending to precision, significance, and knowledge conveyed through the claim...

Dimension 4. Communicating Conclusions and Taking Informed Action

- D4.1.9-12. Construct arguments using precise and knowledgeable claims, with evidence from multiple sources...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 10 / Section 1: NS2-M1C10S1 – Beginnings of the Cold War

(Section 1 of 6)

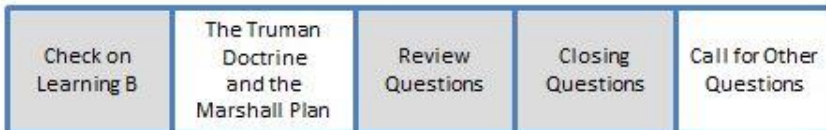
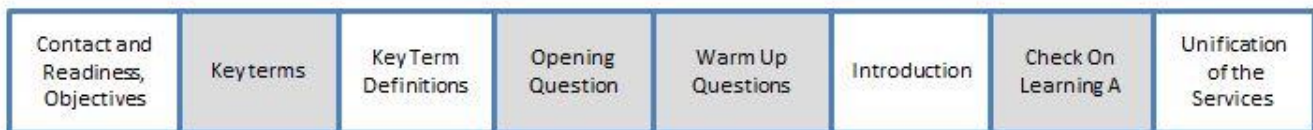
What Students Will Learn to Do:

Demonstrate an understanding of Naval history from the Cold War Era, 1945 – 1991

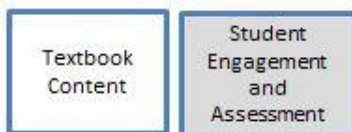
Skills and Knowledge to be Gained:

1. Describe the views and events during the demobilization periods
2. Describe the events leading to the Cold War
3. Explain postwar views and actions in relation to the unification of the armed services and provisions for national security
4. Describe the causes for implementation of the Truman Doctrine and the Marshall Plan

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 10. Place a checkmark beside the NS2-M1C10S1 PowerPoint presentation, and these two CPS question deck files: NS2-M1C10S1 - Key Terms and NS2-M1C10S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 10 / Section 1: NS2-M1C10S1 – Beginnings of the Cold War

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will discuss U.S. Navy involvement in the Cold War from 1945 to 1991. The U.S. Navy ended World War II with the largest Naval force ever assembled in world history. The Navy had grown from 330,000 personnel on 7 December 1941, to 3,408,347 at war's end in 1945. This number included 93,074 uniformed Navy women called WAVES. The Navy had more than 50,000 vessels, 1,200 major fighting ships, and 40,000 airplanes. After this war, the United States could not retreat to a position of isolation and prewar conditions. It had acquired responsibilities around the world, and the only way it could meet those responsibilities was with a powerful Navy. The nation had worldwide duties to perform, and these duties could be discharged only if it continued to be a great sea power. We will cover the expansion of Communism, the creation of the CIA, the Truman Doctrine and the Marshall Plan.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-8
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "What do you think was the mental outlook of Americans after WW II and why?" Since this is a discussion question, it can be engaged using the RPS function where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on the introduction to the Cold War era.	9
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	10
Introduction	Explain that at the end of WW II, the U.S. Navy had assembled the largest Naval force in world history.	11
Introduction	Explain that even before the surrender of Japan, the American public had begun to pressure Congress to dismantle the greatest military force ever assembled in human history and to "bring our boys home." Knowledgeable Americans knew that the United States had acquired worldwide responsibilities by becoming a superpower. The country could not retreat into isolationism as it had done after World War I. Nevertheless, the rush to demobilize was so swift that the American Armed Forces were soon rendered virtually impotent.	12-14

Chapter 10 / Section 1: NS2-M1C10S1 – Beginnings of the Cold War

Introduction	Explain that from wartime Navy of nearly 3.5 million, within a year, merely 500,000 remained. Of an army strength of over 8 million, only 1 million remained a year after the war ended, and the deterioration continued to a low of only 600,000 by 1950. This drastic reduction in strength made it difficult at times to man even the smaller numbers of ships left in commission. Nearly all Naval construction was halted, and 2,000 vessels were decommissioned. Many of these were laid up in “mothballs” for future use in the event of an emergency, with their engines, hulls, and guns covered with protective coatings.	15
Introduction	Explain that the American public had become complacent. There appeared to be no remaining enemies in the world, and further, the United States had a monopoly on the atomic bomb. It was assumed by many that the newly created United Nations could solve any disputes in a peaceful manner that might arise.	16
Introduction	Explain that in the face of this attitude, the Soviet Union quickly resumed the offensive in its war against capitalism. It soon demonstrated that its strategic, long-term goal of a Communist-dominated world remained unchanged. The wartime alliance with the West had been only a temporary tactical maneuver.	17-18
Introduction	Explain that as Americans pinned their hopes on the United Nations, sped their demobilization, and slashed the defense budget, the Soviets made only a token demobilization. By mid-1946, the Soviet Union had consolidated its wartime military gains and subjugated all the nations of Eastern Europe because the United States was unable to effectively contest the action. The U.S. Army was too weakened, and these areas were beyond Navy range.	19-21
Introduction	Explain that America had only two options - make a diplomatic protest or use the atomic bomb. The former could accomplish nothing without any power to back it up, and American public opinion was solidly against war—especially atomic war—even in the face of blatant Soviet aggression in territories adjacent to the USSR.	22-23
Introduction	Explain that President Truman, top officials in his government, and United States military Commanders soon became aware of the Soviet intentions. Soviet annexation of eastern Poland and the Baltic countries, installation of Communist governments in Eastern Europe; meddling in the internal affairs of Iran, Turkey, and Greece; aiding Mao Zedong’s Communists in the Chinese civil war; and the creation of Communist puppet governments in East Germany and North Korea left no doubt.	24-26
Introduction	Explain that in order to motivate Americans who were again seeking a “return to normalcy,” in March 1946, President Truman invited Winston Churchill to make a speech at Westminster College in Fulton, Missouri. He was to issue a strong warning concerning the USSR. In this speech Churchill stated, “From Stettin in the Baltic to Trieste in the Adriatic an iron curtain has descended across the continent.... From what I have seen of our Russian friends and allies during the war, I am convinced that there is nothing they admire so much as strength, and there is nothing for which they have less respect than for weakness, especially military weakness.” Thus was born the term given to the barrier between the West and Communism: the Iron Curtain.	27-29
Introduction	Explain that the American public was startled, but it was not moved toward significant action. When Truman proposed universal military training (the draft) as a means of rebuilding the services, Congress eventually responded with a Selective Service Act full of loopholes for those who wished to avoid military service. The weakening of the services continued. Ships sat alongside piers with half crews, unable to get under way.	30-31
Check on Learning Questions A (Lesson questions 3-4)	Check in on student’s understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	32

Chapter 10 / Section 1: NS2-M1C10S1 – Beginnings of the Cold War

Unification of the Services	Explain that along with demobilization came a reappraisal of the entire U.S. defense structure. Under the slogan of “unification,” many in government and in the Army and its Air Corps component proposed a centralized military establishment that would, they hoped, make the shrinking peacetime defense budgets stretch further. The Navy came under special criticism. Several loud voices stated that the Navy was extravagant and unnecessary because there was no Naval power anywhere in the world to oppose the US.	33-34
Unification of the Services	Explain that the Army Air Corps sought independent status as the U.S. Air Force. They pointed to their strategic bombing role in Europe and Japan, and the fact that only they had the ability to deliver the atomic bomb, since Navy planes were not large enough. Some Air Corps generals questioned the need for a Navy at all, arguing that any future wars, unlikely as they were, could be won cheaply and quickly by bombing. They saw the proposed Air Force as the nation’s new first line of defense.	35-37
Unification of the Services	Explain that Fleet Admiral Nimitz, now the Chief of Naval Operations, took a more realistic view. He felt that no single weapons system would be adequate enough to provide for all aspects of national defense or to protect the nation’s growing world interests, most of which were dependent upon free use of the seas. Various Navy spokesmen such as Nimitz and Secretary of the Navy James Forrestal did not foresee a major world war in the immediate future. Instead, they saw the dangers of takeovers in countries bordering the Soviet Union and Communist-inspired insurgencies in many underdeveloped nations. The countries threatened were the ones most closely associated with the West and most dependent upon logistic and tactical support from the sea.	38-39
Unification of the Services	<p>Explain that Forrestal opposed the idea of a single Chief of Staff over all of the armed forces because that would almost certainly result in an emphasis on one of the services at the expense of the others.</p> <p>Explain that despite the general Navy opposition to unification, there were many things to be said for it. Unified command in large combat areas could be a significant advantage, improving overall battle coordination. Also, it might help to eliminate some waste and duplication, which none of the services could afford with their austere peacetime budgets.</p>	40-41
Unification of the Services	Explain that after long debate, Congress finally passed the National Security Act (NSA) in July 1947. The new law created the Department of Defense, headed by a Secretary of Defense, with subordinate Departments of the Army, Navy, and Air Force, and the Joint Chiefs of Staff. Under the terms of the NSA, the Secretary of Defense became a member of the President’s Cabinet, while the Secretaries of the services did not have Cabinet rank. It established the Air Force as a separate service and gave it responsibility for strategic bombing and for combat operations in support of land armies. The Navy retained its carrier aviation and its land-based reconnaissance wing, as well as the Marine Corps. The Army kept its traditional roles. Secretary Forrestal became the nation’s first Secretary of Defense.	42-47
Unification of the Services	Explain that under the same act, the National Security Council, with permanent members including the President, Vice President, Secretary of State, and Secretary of Defense, became the nation’s top National Security policy body. The National Security Act also provided for the creation of the Central Intelligence Agency (CIA).	48-50
Check on Learning Questions B (Lesson questions 5-6)	Check in on student’s understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	51

Chapter 10 / Section 1: NS2-M1C10S1 – Beginnings of the Cold War

The Truman Doctrine and the Marshall Plan	Explain that several events that occurred during the months before approval of the National Security Act made a significant impact on the congressional decision to maintain a strong Navy–Marine Corps team with all of its component forces. The post–World War II Soviet actions into the Balkan and Baltic nations had gone unopposed, but when the Soviets tried to expand into Iran and the countries bordering the eastern Mediterranean, President Truman took steps as Commander in Chief that caused Congress to become more aware of the danger. Strong pressure in the United Nations by the United States caused the Soviets to back down and get out of northern Iran.	52-56
The Truman Doctrine and the Marshall Plan	Explain that in 1946-47 George Kennan, a prominent American diplomat stationed in Moscow, published his view that “the main element of any United States policy toward the Soviet Union must be that of a long-term, patient but firm and vigilant containment of Russian expansionist tendencies.” This policy of containment became the cornerstone of U.S. cold war foreign policy for the next four decades	57-58
The Truman Doctrine and the Marshall Plan	Explain that in the spring of 1947, President Truman applied this containment policy to counter Soviet moves toward Greece and Turkey. In Greece, there had been civil war since the closing days of World War II, with Communists supported by the Soviets seeking to overthrow the legitimate government that had returned to power there after the war. The Soviets had been threatening Turkey since the war as well, because Stalin wanted access to the Dardanelles, through which Soviet ships from Black Sea ports had to transit to reach the Mediterranean.	59-60
The Truman Doctrine and the Marshall Plan	Explain that in March 1947, in a speech before Congress, President Truman enunciated the Truman Doctrine, thus formalizing the containment policy. Truman stated, “It must be the policy of the United States to support free peoples who are resisting attempted subjugation by armed minorities or by outside pressures.... We must assist free peoples to work out their own destinies in their own way.” The key to making the Truman Doctrine successful was the U.S. Navy. In support of the doctrine, Congress voted substantial economic aid to both Greece and Turkey. U.S. military bases were established in both countries, and they are still there today. U.S. Navy units were sent to the Mediterranean as a diplomatic show of force. Soviet expansion toward the Mediterranean was thus neutralized.	61-64
The Truman Doctrine and the Marshall Plan	Explain that this was the beginning of the permanent deployment of the U.S. Sixth Fleet in the Mediterranean Sea. Truman said that U.S. policy was “to support the cause of freedom wherever it was threatened.” Thus the Navy found itself projecting American foreign policy at the same time as it was struggling in the halls of Congress for its very existence.	65-67
The Truman Doctrine and the Marshall Plan	Explain that in June 1947, Secretary of State George Marshall announced Truman’s plan to provide economic aid for reconstruction of European countries. This plan, formally named the European Recovery Program, became known as the Marshall Plan. Its purpose was to restore the economies of the war-ravaged countries in Europe and in the process, make it more difficult for the Soviets to make further inroads there. Although the Soviet Union was invited to participate, it refused to do so, and it prohibited any of its new satellites from accepting the American assistance. The Soviet leaders denounced the plan as American economic aggression. Thus began an era of contention between the Western democracies headed by the United States and the Communist bloc dominated by the USSR that would extend over much of the next forty-five years. The cold war had begun in earnest.	68-71
The Truman Doctrine and the Marshall Plan	Explain that as American political and economic policy began to assert itself, several Soviet actions solidified Western determination. In 1948, the Communist party executed a sudden coup d’état in Czechoslovakia, seizing complete control of the country and causing the death of the Czech president. Many Americans and Europeans now began to take note of the aggressive the forces of Soviet-backed communism.	72-73

Chapter 10 / Section 1: NS2-M1C10S1 – Beginnings of the Cold War

The Truman Doctrine and the Marshall Plan	Explain that the next incident was the Berlin Blockade in June 1948. The Soviets clamped a blockade on all materials entering or leaving the occupied city of Berlin by road, rail, or canal. This action was an attempt to cut off the army garrisons of the western Allies in the city including Britain, France, and the United States, and starve West Berlin into capitulation to the Soviets and their East German satellite. The Allies responded with a massive airborne supply operation called the Berlin Airlift, which lasted eleven months. During this time, over 2 million tons of supplies were flown into the city, one-fourth of it carried by Navy planes.	74-76
Review Question	The Review Question is, “What was the objective of the unification of U.S. armed forces?” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	77
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	78
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	79

III. Supplemental Activities -

A. In class Activity:

Supplies required: Handouts – The Iron Curtain Activity and Map

When: The In-Class Activity can be done at any time to either introduce the idea of the “Iron Curtain” and the tensions that existed between the United States and the USSR or to check for understanding about lesson objectives.

- Iron Curtain activity. Make copies of the iron curtain map. Have the cadets complete the Iron Curtain Activity.

B. Take Home Activity: Use the handout The Cold War Era, 1945-1991. Have the Cadets write a paragraph stating whom they believe is responsible for the Cold War - the United States or the USSR? Have Cadets be sure to back up their claim with evidence from the items listed on the handout.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 10 / Section 1: NS2-M1C10S1 – Beginnings of the Cold War

Activity1: In Class Activity – The Iron Curtain Activity

Name: _____ Date: _____ Class: _____

Directions: Using the map provided, complete the following items.

1. With a black marker, draw the Iron Curtain on the map referred to by Winston Churchill in his speech.

2. Color all Communist controlled countries red.

3. Color any NATO countries blue.

4. What do you notice about your map?

5. Why do you think it was called the “Iron Curtain”?

6. In your own words, what was the Iron Curtain?

Chapter 10 / Section 1: NS2-M1C10S1 – Beginnings of the Cold War

Activity1: In Class Activity – The Iron Curtain Map

Name: _____ Date: _____ Class: _____



Chapter 10 / Section 1: NS2-M1C10S1 – Beginnings of the Cold War

Activity1: Take Home Activity – The Cold War Era, 1945 – 1991

Name: _____ Date: _____ Class: _____

Who is Responsible for the Cold War?

Reflect on things you learned in this lesson such as:

The Iron Curtain Speech

The Truman Doctrine

The Marshall Plan

Unification of Forces

Write a paragraph stating whom you believe is responsible for the Cold War - the United States or the USSR? Be sure to defend your claim with evidence from the items listed above.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Chapter 10 / Section 2: NS2-M1C10S2 – NATO

(Section 2 of 6)

What Students Will Learn to Do:

Demonstrate an understanding of Naval history from the Cold War Era, 1945 – 1991

Skills and Knowledge to be Gained:

1. Describe the events leading to formation of the North Atlantic Treaty Organization (NATO)
2. Describe postwar activities in the Far East regarding insurgencies, nationalism and anti-colonialism

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	NATO	Warm Up Questions	Warsaw Pact	The Far East
Check On Learning A	The Korean War (A)	Videos 1 & 2 The Korean War	The Korean War (B)	Video 3 The Korean War	The Korean War (C)	Video 4 The Korean War	The Korean War (D)
Check on Learning B	The Korean War (E)	Operation Chromite: Inchon (A)	Video 1 Operation Chromite: Inchon	Operation Chromite: Inchon (B)	Video 2 Operation Chromite: Inchon	Operation Chromite: Inchon (C)	Review Questions
Closing Questions	Review Questions	Call for Other Questions					

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 10 / Section 2: NS2-M1C10S2 – NATO

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 10. Place a checkmark beside the NS2-M1C10S2 PowerPoint presentation, and these two CPS question deck files: NS2-M1C10S2 - Key Terms and NS2-M1C10S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>This lesson will cover the establishment of NATO and the major and minor conflicts beginning with the Korean War and to Vietnam and will include the eventual demise of the Soviet Union. The Korean War represented the first full-scale military response to Communist aggression. We will address the initial stages of Korean War, Naval contributions, Operation Chromite: Inchon, the breakout at Pusan, the new war: Chinese intervention, dismissal of General MacArthur, truce talks, and Korean final.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-6
Opening Question(Random Pick a Student – “RPS”)	<p>This Opening Question is, “Describe what it means to make a pact with someone.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on NATO.</p>	7
NATO	Explain that in response to the growing Soviet menace, the United States, Canada, and their West European allies agreed in 1949 to create the North Atlantic Treaty Organization (NATO). In this treaty, all agreed that “an armed attack against one or more of them . . . shall be considered an attack against them all.”	8-9
NATO	Explain that the nations that signed this military alliance were Belgium, Britain, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, and the United States. Turkey and Greece became members of the alliance in 1951, the Federal Republic of Germany joined in 1955, and Spain joined in 1982. France withdrew from military participation in 1966, though it still participates in political affairs. The former Soviet satellite countries Hungary, Poland, and the Czech Republic joined in 1999, and others later. NATO headquarters today is located in Belgium.	10-12

Chapter 10 / Section 2: NS2-M1C10S2 – NATO

NATO	Explain the Communist response was that in 1949 the Soviets established the Council for Mutual Economic Assistance as the economic organization of Communist-bloc countries.	13
Warm-Up Questions(Lesson questions 1-2)	Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions. Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.	14
Warsaw Pact	Explain that in 1955 the Eastern European Mutual Assistance Treaty, more commonly referred to as the Warsaw Pact, created the military counterpart to NATO. The former organization died with the fall of the Berlin Wall in 1989 and the demise of the Soviet Union in 1991.	15-17
Warsaw Pact	Explain that throughout the balance of the cold war from the early 1950s on, Soviet turboprop Bear and supersonic Badger reconnaissance aircraft continually monitored U.S. and NATO maritime exercises throughout the Mediterranean Sea and Atlantic Ocean areas. In the 1980s, some of these aircraft were based in Cuba. From Cuba, the reconnaissance aircraft often flew surveillance missions all along the U.S. Atlantic seaboard. They were often intercepted and escorted by U.S. and NATO fighters back to international air space, keeping tension high throughout these years.	18
The Far East	Explain that in the Far East, the end of World War II and the defeat of Japan fanned the smoldering flames of nationalism and anti-colonialism into major insurgencies trying to take control of weak governments. Communist backing was often a major factor in these revolutions.	19-20
The Far East	Explain that in December, 1949, after five years of civil war, the government of Nationalist China, headed by Chiang Kai-shek, was driven from the Chinese mainland to Taiwan by Mao Zedong's Communists. The vacuum left by British and French withdrawals from Southeast Asia in the early 1950s stimulated insurgencies in Burma, Thailand, Malaya, and Indochina. Indochina erupted into open warfare. The Dutch were forced to leave the East Indies after a revolution by the Indonesian people. The British granted independence to India, Pakistan, and Ceylon.	21-24
The Far East	Explain that in Korea after World War II, the Potsdam Conference had decreed that this former Japanese possession would be temporarily divided. The Soviets would occupy the part north of the thirty-eighth parallel and the United States would occupy the southern part of the country. The Soviets quickly established a puppet Communist regime and trained a large North Korean army. In May 1948 they established the People's Democratic Republic of Korea, with its capital in Pyongyang.	25-26
The Far East	Explain that in the south, the United States and the United Nations helped establish the Republic of Korea (ROK). In free elections, the South Koreans elected Syngman Rhee as first president and set up their capital at Seoul in July 1948. Not until U.S. forces began their evacuation did an American advisory group start to train an ROK army. This army was still ill-equipped and poorly organized when the last of the American garrison forces departed in June 1949. The lack of American resolve had set the stage for another war involving American servicemen. A year later, on 25 June 1950, the North Korean army crossed the thirty-eighth parallel in a full-scale invasion of South Korea.	27-28

Chapter 10 / Section 2: NS2-M1C10S2 – NATO

Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	29
The Korean War	Explain that the North Korean invasion of South Korea in June 1950, backed by the Soviet Union and the Chinese Communists, had two main purposes. The first was to unify Korea into a Communist state. The second purpose was to establish a geographic dagger pointed at the center of Japan, where General MacArthur's occupation rule prevented the Communist subversion from gaining a foothold. U.S. State Department spokesmen had suggested that Korea was not important to American strategic defense. This implied that the United States would not oppose an invasion, and undoubtedly encouraged the North Korean leaders to attempt open aggression.	30-33
The Korean War	Explain that as soon as President Truman learned of the invasion, he directed the U.S. delegate to the United Nations Security Council to call an emergency meeting. The USSR was boycotting the council, and with no Soviet veto to hurdle, the Security Council condemned the North Korean act as a breach of world peace and ordered military sanctions.	34-35
Videos 1 & 2 on The Korean War	Show videos 1 & 2 on the Korean war.	36-37
The Korean War	The United States assumed leadership of the direction of military operations. President Truman ordered the Joint Chiefs of Staff to take any action necessary to aid South Korea and repel the invasion. The Joint Chiefs named General MacArthur, Commander in Chief, Far East. He was later named Supreme Commander of United Nations Forces.	38-39
The Korean War	Explain that the UN Security Council called on other member nations to come to the aid of South Korea and to assist the United States with military forces. Eventually, fourteen other countries—Great Britain, Canada, Australia, New Zealand, France, Brazil, Greece, Turkey, Norway, Sweden, the Netherlands, Thailand, Colombia, and the Philippines—sent military and naval contingents, and many other nations sent medical and material aid.	40-41
Video 3 on The Korean War	Show video 3 on the Korean War.	42
The Korean War	Explain that the South Koreans were soon overrun by fifteen well-equipped North Korean divisions. Seoul fell only three days after the invasion, and the "Reds," as the Communists were called, proceeded southward with little opposition.	43
Video 4 on The Korean War	Show video 4 on the Korean War.	44
The Korean War	Explain that General MacArthur committed three of the four American occupational divisions in Japan to stem the tide and gain some time for UN forces to build up strength through the port of Pusan. U.S. General Walton Walker and the remnants of the ROK army fought hard but retreated steadily. By late July 1950, only an area about 25 miles west by 80 miles north of Pusan remained in allied hands. This was called the Pusan Perimeter. The U.S. was pushed into a corner and reinforcements and equipment poured in.	45-46

Chapter 10 / Section 2: NS2-M1C10S2 – NATO

The Korean War	Explain that fortunately, at this point, American reinforcements and equipment began pouring into the Pusan Perimeter. Aided by naval bombardment, air strikes, and U.S. Marines, the defenders began to inflict severe casualties on the attacking North Koreans.	47
The Korean War	Explain that by the third week of August, after being stalled for three weeks on the Pusan Perimeter, the North Korean drive began losing momentum and General MacArthur began plans for possibly the most daring amphibious assault ever conceived.	48
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	49
The Korean War	Explain that by September 1950, General Walker had consolidated the Pusan Perimeter and made it nearly impossible to penetrate. A stalemate had been reached. The UN forces were growing ever stronger and could undoubtedly have broken through the weakening North Korean lines but at great cost. General MacArthur did not want to incur those losses, so he proposed an exceptionally complex amphibious assault on Inchon, the port of Seoul.	50-51
Operation Chromite: Inchon	Explain that the objective was to capture Inchon and Seoul, and thus cut the North Korean supply line to their armies on the Pusan Perimeter. This would isolate over 90 percent of the North Korean army and, for all practical purposes, destroy North Korea's capability for making war.	
Operation Chromite: Inchon	Explain that the proposed landing at Inchon presented extreme difficulties. The only approach to the port was through the Flying Fish Channel, a tortuous 30-mile run through mud flats. These mud flats became visible each day at low tide. The range of tide at Inchon is one of the greatest in the world—29 feet on the average, and sometimes as much as 36 feet. It was this tide that made the landing feasible, for it allowed the LSTs to go right up to Inchon's waterfront to disembark troops and vehicles. The troops would have to use ladders to scale a seawall. Worst of all, if the landing was unsuccessful, not only the troops but also the LSTs would be lost, since the ships would later be trapped, sitting high and dry on the tidal mud flats.	53-56
Operation Chromite: Inchon	Explain that D Day for the Inchon landing was set for 15 September, because it was only on the three days beginning 15 September that the tides would meet amphibious requirements. The Marine brigade, a key force in General Walker's successful defense of the Pusan perimeter, was withdrawn to form the nucleus of the First Marine Division, which would spearhead the landing.	57
Operation Chromite: Inchon	Explain carrier air support was provided by Admiral Ewan from three U.S. carriers in <i>Task Force 77</i> . Vice Admiral Arthur Struble, Commander of the Seventh Fleet, was in overall command.	58-60
Video 1 on Operation Chromite: Inchon	Show video 1 Operation Chromite: Inchon	61
Operation Chromite: Inchon	Explain that the First Marine Division was to make the initial landing, followed by the U.S. Seventh Infantry Division, an airborne regiment, and a South Korean Marine regiment. These ground forces made up the X Corps, commanded by Major General Edward Almond, USA.	62
Operation Chromite: Inchon	Explain that a cruiser-destroyer force threaded its way up the Flying Fish Channel on 13 September to bombard the North Korean fortifications on the islands of Wolmido	63-64

Chapter 10 / Section 2: NS2-M1C10S2 – NATO

	and Sowolmido, which protected the harbor and city. There was a spirited exchange of fire during which three destroyers were hit, but the shore and air bombardment on 13–14 September was sufficient to enable the landing to precede on schedule the following morning.	
Operation Chromite: Inchon	Explain that at 0630 on the fifteenth, the first waves of American and South Korean forces stormed ashore at- Green Beach on Wolmido. The island was secured in thirty-one minutes. Sowolmido followed quickly, thanks to 40-mm fire from one of the support ships. The main landing followed in the late afternoon. Red Beach was in downtown Inchon, the only place heavy equipment such as tanks, bulldozers, and trucks could be landed. Blue Beach was on the southern outskirts of the city on a muddy, narrow beach too soft to take heavy equipment.	65-66
Operation Chromite: Inchon	Explain that at 1730, the first wave hit Red Beach. Not until the fourth wave landed did the defenders commence any serious opposition, but by that time the troops ashore were securing enemy strong points and advancing toward their first objective line which lay 1,000 yards inland. By 2000, they had moved beyond their objective.	67-69
Operation Chromite: Inchon	Explain that the landings went on during the night and the next day, as bulldozers tore down the seawall to facilitate landing heavy equipment. The Marines at Blue Beach landed against light resistance and seized the main rail line to Seoul, but their LST support did not arrive until the following morning's high tide.	70
Operation Chromite: Inchon	Explain that twenty-four hours after the landings at Inchon began, the Marines shifted their command post ashore and declared the landing phase of the operation concluded. On 18 September and before the enemy could regroup, Kimpo Airfield outside Seoul was captured and the Marines were advancing toward Seoul.	71-72
Video 2 on Operation Chromite: Inchon	Show video 2 Operation Chromite: Inchon	73
Operation Chromite: Inchon	Explain that the Inchon operation proved to be one of the most successful amphibious assaults in military history. "The Navy and Marines have never shone more brightly," General MacArthur remarked.	74-75
Review Question	The Review Question is, "List 2-3 reasons why the Inchon Landing was an example of brilliant generalship." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	76
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	77
Review Question	The Review Question is, "Discuss the role the tides played on Operation Chromite." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	78
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	79

Chapter 10 / Section 2: NS2-M1C10S2 – NATO

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handouts for in class and take home activities

When: The In-Class Activity should take place before slide 50, “The Korean War,” as an introduction to the topic, or after the lesson as a reflection.

- As a class, read the handout of the poem, “Korea, the Chosen Place”.
- Discuss the following:
 1. How does the author feel about Korea? What words led you to this conclusion?
 2. How do you think the author feels about the Korean War? The American Government? NATO?
 3. What is the mood of this poem? Why did the author write it?

B. Take Home Activity: Cadets will complete a Multi-Flow thinking map which illustrates the causes and effects of the Korean War.



Tech Tip: Students are able to learn more on the [Utah Education Network](#), a great website that links to many resources about the Korean War.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 10 / Section 2: NS2-M1C10S2 – NATO

Korea, The Chosen Place, a poem

Korea

Korea, the chosen place
Ravished by war, laid to waste
All United Nations there engaged
In another history Page.
Korea, tis not a beauty site
To see by day or by night.
The eye beholds only the gloom
Of a country buried in war's tomb.
Korea, it's been torn up
and torn down;
Marched up
and marched down.
Korea, blood shed, land and mountains
Have been bathed by youthful fountains.
Brave men here have gone to their reward
---S/Sgt. Irvin V. Worden

Perishing 'neath the sword.
Korea, twas not a war they say;
Only a police action day by day,
A testing place
For the human race.
Korea, two ideals clashing
Communism and democracy smashing;
The U.N.'s firm stand
Against the hammer red hand.
Korea, a question of peace there,
A question of peace everywhere
Soon it may be inflamed
Again in blood and war's shame.
Korea, a prayer of the free
That in peace here we may see
The sword no more to rise
On any land or any skies.

The poem is by S/SGT Irvin V. Worden, written on 14 December 1953 while stationed in Korea. This poem is included in the book "Korea, The Chosen Place, A View From Old Smokey", the story of my father's experiences in Korea. --Stephen H. Worden

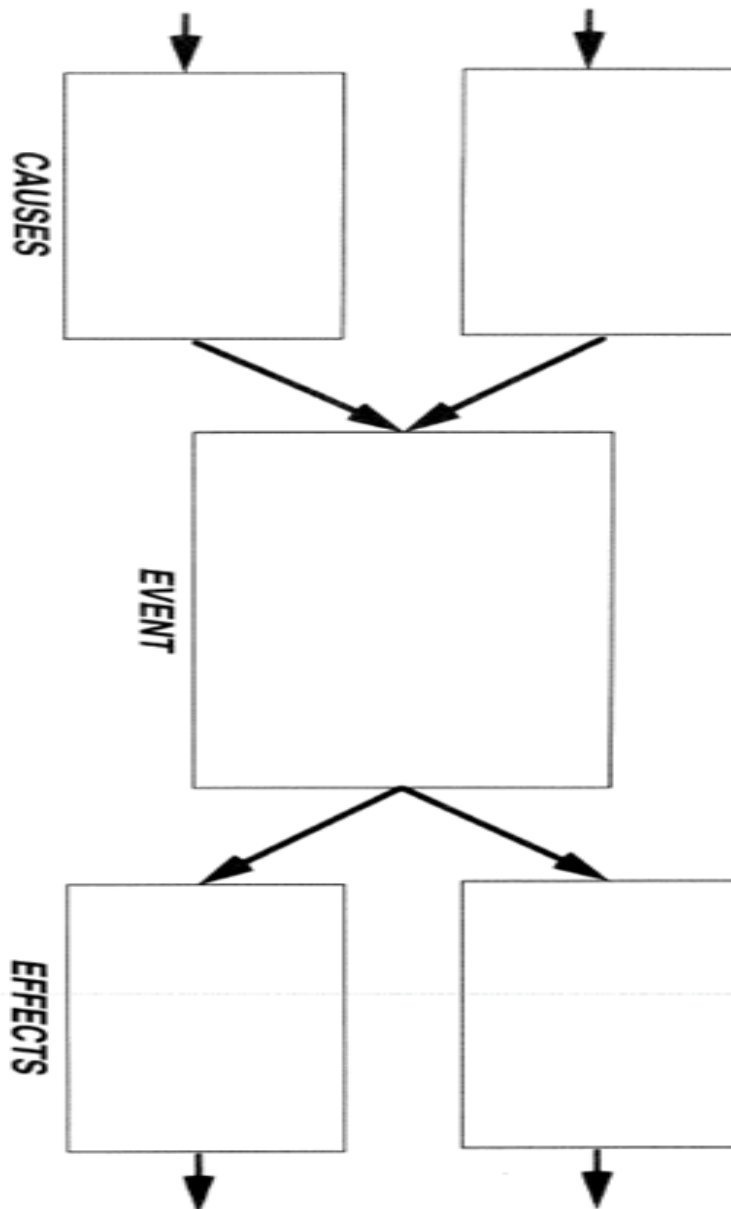
<http://www.koreanwar.org/html/units/frontline/worden.htm>

Chapter 10 / Section 2: NS2-M1C10S2 – NATO

Activity1: Take Home Activity – The Cold War Era, 1945 – 1991 Part II

Name: _____ Date: _____ Class: _____

Directions: Create a multi-flow map illustrating the causes and effects of the Korean War based upon the lesson and the textbook reading. More spaces may be added for causes and effects. This multi-flow map is only an example of what a multi-flow map might look like.



Chapter 10 / Section 3: NS2-M1C10S3 – Breakout at Pusan

(Section 3 of 6)

What Students Will Learn to Do:

Demonstrate an understanding of naval history from the Cold War Era, 1945 – 1991

Skills and Knowledge to be Gained:

1. Describe the events involved in the Breakout at Pusan
2. Describe the events involved in the Chinese Intervention within the Korean War
3. Describe the events involved in the dismissal of General Douglas MacArthur from all duties in the Far East
4. Describe the events involved in the Truce Talks of the Korean War exchange of prisoners
5. Describe naval confrontations in the post-Korean aftermath and how these confrontations related to the U.S. Navy

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Breakout At Pusan (A)	Video1 Breakout at Pusan	Breakout At Pusan (B)
Video2 Breakout at Pusan	Breakout At Pusan (C)	Video3 Breakout at Pusan	Breakout At Pusan (D)	Chinese Intervention (A)	Video1 Chinese Intervention	Chinese Intervention (B)	Video2 Chinese Intervention
Chinese Intervention (C)	Video3 Chinese Intervention	Chinese Intervention (D)	Check On Learning A	Chinese Intervention (E)	Video4 Chinese Intervention	Chinese Intervention (F)	Dismissal of MacArthur (A)
Video Dismissal of MacArthur	Truce Talks (A)	Video1 Truce Talks	Truce Talks (B)	Video2 Truce Talks	Check on Learning B	Korean War Aftermath	Review Questions
Closing Questions	Call for Other Questions						

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 10 / Section 3: NS2-M1C10S3 – Breakout at Pusan

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 10. Place a checkmark beside the NS2-M1C10S3 PowerPoint presentation, and these two CPS question deck files: NS2-M1C10S3 - Key Terms and NS2-M1C10S3 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will learn that the Korean War represented the first full-scale military response to Communist aggression. We will address the initial stages of Korean War, Naval contributions, Operation Chromite: Inchon, Breakout at Pusan, the New War: Chinese intervention, dismissal of General MacArthur, truce talks, and Korean final. During the 10 years after the Korean War, innovations such as the hydrogen bomb, nuclear submarines and ballistic missiles prevented major military intervention. The United States government used the Navy to stifle minor military aggression such as the Cuban missile crisis, the Lebanese operation, and the defense of Taiwan (formerly Formosa).</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5
Opening Question(Random Pick a Student - "RPS")	This Opening Question is, "Name 2-3 facts you know about General Douglas MacArthur." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds with before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on the Breakout at Pusan.	6
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	7

Chapter 10 / Section 3: NS2-M1C10S3 – Breakout at Pusan

Breakout at Pusan	Explain that on the day after the Inchon landing, General Walker and his Eighth Army began a major offensive to break out of the Pusan Perimeter.	8
Video 1 on Breakout at Pusan	Show video 1 on breakout at Pusan.	9
Breakout at Pusan	Explain that the North Koreans were now in an untenable military situation. With their main supply route through Seoul severed and their only other supply route along the east coast road under steady Naval bombardment, the North Koreans had no means of logistic support. When the Inchon invasion force turned southward and met the Eighth Army coming north from Pusan on 26 September, for all practical purposes, the war in South Korea was over. On the twenty-eighth Seoul fell. All fighting had not ceased, but the North Koreans had no hope of victory. All that remained was the task of “mopping up.” In that process, over 125,000 North Korean soldiers were taken prisoner.	10-12
Video 2 on Breakout at Pusan	Show video 2 on breakout at Pusan.	13
Breakout at Pusan	Explain that after much debate in the United Nations, the UN authorized General MacArthur to proceed north of the thirty-eighth parallel to destroy the remnants of the North Korean forces. While the Eighth Army advanced against heavy opposition toward Pyongyang, the ROK army, now reorganized, reequipped, and trained in the hardships of war, roared 100 miles northward in ten days along the east coast against little opposition.	14-15
Breakout at Pusan	Explain that another major amphibious assault behind North Korean lines was planned to assist the ROK forces by cutting off the enemy’s route of escape and thereby hasten the fall of Pyongyang. MacArthur embarked the X Corps in amphibious ships for transportation from Inchon to the east coast of North Korea for an assault on Wonsan. The concept was similar to the Inchon landing. The retreating North Koreans would be encircled, and their capability to resist would be even further reduced.	16
Breakout at Pusan	Explain that the timetable was interrupted, however, by a huge Communist minefield at Wonsan Harbor. Instead of taking five days to sweep the mines clear as planned, the job took fifteen days. The minefield had caused the allies to lose valuable time. The delay enabled the North Koreans to retreat in some semblance of order Pyongyang on 19 October.	17
Video 3 on Breakout at Pusan	Show video 2 on breakout at Pusan.	18
Breakout at Pusan	Explain that the amphibious landing became an “administrative” operation, taking place after the ROK forces had already captured the city. In the meantime, the Eighth Army captured Pyongyang on 19 October.	19
Chinese Intervention	Explain that despite warnings that his invasion of Communist North Korea would bring Chinese Communist intervention, MacArthur pressed his forces and continued the drive northward toward the Yalu River, the boundary with Chinese Manchuria. MacArthur’s intelligence officers did not believe the Chinese would enter the war in force. They believed that if the Chinese were going to do it at all, they would have entered the war when the allies had their back to the sea at Pusan. Thus, MacArthur sent the Eighth Army north from Pyongyang and the X Corps north from Hamhung. On 26 October elements of the ROK army arrived at the Yalu.	20-21

Chapter 10 / Section 3: NS2-M1C10S3 – Breakout at Pusan

Chinese Intervention	Explain that because of no east/west communications or roads, there was an 80-mile gap between the two northward-moving UN forces. Chinese forces began to advance southward into this gap. Elements of the ROK army met the Chinese in several heavy encounters in late October and early November. On 2 November, Chinese forces attacked units of the Eighth Army near Unsan.	22
Video 1 on Chinese Intervention	Show video 1 on Chinese intervention.	23
Chinese Intervention	Explain that MacArthur warned the Joint Chiefs on 6 November that if the movement of Chinese forces across the Yalu continued, his army faced destruction. On 24 November, MacArthur gave the order for his forces to begin a drive to the Yalu. On the same day, the first U.S. elements reached the Yalu at Hyesanjin.	24-25
Video 2 on Chinese Intervention	Show video 2 on Chinese intervention.	26
Chinese Intervention	Explain that on 25 November 1950 200,000 Chinese, called Volunteers of the People's Liberation Army, launched a major offensive, sweeping the allies before them and cutting off a large group of Marines at the Chosin Reservoir north of Hungnam.	
Video 3 on Chinese Intervention	Show video 3 on Chinese intervention.	28
Chinese Intervention	Explain that the next two weeks saw the United Nations forces fight their way back southward in full retreat, even as the cold and snow of the Korean winter closed in. At temperatures as low as 25 degrees below zero, Marines and other allied forces were often forced to fight their way out of surrounded positions. Marine planes pounded the Chinese forces in the hills.	29
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	30
Chinese Intervention	Explain that under an Air-Support umbrella, On 9 December, the Marines finally reached the coastal city of Hungnam. During the next two weeks, 105,000 troops, 90,000 Korean refugees, thousands of vehicles, and tons of bulk cargo were combat-loaded in orderly manner onto waiting amphibious vessels in the greatest "amphibious operation in reverse" ever conducted. During the entire time, naval gunfire and carrier air strikes kept the Communist forces back. This created a no-man's-land around the Hungnam defense perimeter that the Chinese could not penetrate. On Christmas Eve 1950, the last troops departed and before leaving, the Navy's Underwater Demolition Teams blew up all port facilities.	31-34
Chinese Intervention	Explain that the forces evacuated from Hungnam were sped southward and reintroduced into the fighting below the thirty-eighth parallel, where, by 15 December, the bulk of United Nations forces had retreated.	35
Chinese Intervention	Explain that, on 26 December and following the death of General Walker in a jeep accident, General Matthew Ridgway took command of the Eighth Army. The Eighth Army slowed its retreat but could not stop the Chinese advance before losing Seoul again on 4 January 1951.	36
Video 4 on Chinese Intervention	Show video 4 on Chinese intervention.	37

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Chinese Intervention	Explain that in late January, Ridgway began a slow advance toward the Han River south of Seoul - a methodical drive that culminated in the recapture of the South Korean capital on 15 March. UN forces made more advances in the succeeding months, particularly along the east coast, where they reached a point about 50 miles north of the thirty-eighth parallel. It was at this location that the war bogged down for both sides.	38-39
Dismissal of MacArthur	Explain that General MacArthur had hated the limitations placed upon him after the Chinese intervened. He particularly wanted to be allowed to follow Chinese aircraft in "hot pursuit" over the Yalu River into Manchuria and to bomb Chinese staging bases on the north bank of the river. The Western European allies put great pressure on the United States to forbid such action. They feared that the war would escalate and eventually involve the Soviets on the basis of the Sino-Soviet Mutual Defense Treaty. This opinion was shared by the U.S. State Department, and their perspective prevailed with President Truman.	40-42
Video on the Dismissal of MacArthur	Show video on the dismissal of MacArthur.	43
Dismissal of MacArthur	Explain that when he was unable to persuade President Truman to accept his recommendations, in March 1951 General MacArthur sent a letter to Joseph Martin, the minority leader of the House of Representatives, attacking the President's policies. When Martin made the letter public, President Truman interpreted MacArthur's pointed response as a violation of a Presidential order. Truman relieved MacArthur for insubordination, replacing him with General Ridgway.	44
Dismissal of MacArthur	Explain that in his letter, MacArthur pointed out that "Europe's war against the Communists was being fought in Asia with arms, while the diplomats there still fight it with words; that if we lose the war to Communism in Asia the fall of Europe is inevitable; win it and Europe most probably would avoid war, and yet preserve freedom. . . . There is no substitute for victory."	45
Truce Talks	Explain that by June 1951, the severe casualties inflicted on the Chinese began to make an impression. The USSR's Ambassador to the United Nations suggested that armistice talks might be held, and the United Nations leaders agreed.	46
Video 1 on Truce Talks	Show video 1 on truce talks.	47
Truce Talks	Explain that thereafter began over two years of almost fruitless negotiations at Panmunjom, a small village along the thirty-eighth parallel. Meanwhile, fierce fighting continued, although neither side attempted a major offensive to capture territory.	48
Truce Talks	Explain that during the negotiations, the Chinese Communists showed no willingness to compromise. To them, a concession was a sign of weakness and an invitation for the other side to make additional demands. Negotiating with the Communists was clearly shown to be another battlefield, with the weapons being steadfastness of policy, infinite patience, and complete firmness.	49
Truce Talks	Explain that Dwight Eisenhower was elected President in November 1952. A major promise of his campaign was to bring an end to the Korean War. This stimulated new efforts in the truce talks, and finally, after more than two years of negotiations, an armistice was signed on 27 July 1953. The agreement divided the two Koreas along a frontier near the thirty-eighth parallel, but based on the existing cease-fire line. South Korea kept its freedom, gaining in the process about 1,500 square miles of territory at	50-53

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	a cost of 70,000 South Korean, 34,000 American, and 5,000 other UN casualties on the battlefields. In addition, several million Korean civilians are believed to have died during the course of the war.	
Truce Talks	Explain that a major issue in the truce talks concerned prisoners of war (POWs). Many North Koreans and Chinese taken prisoner in the south refused to go back to their countries. Furthermore, after American prisoners were returned, they brought with them horror stories of inhumane treatment in North Korean prison camps and failure by North Korea to comply with international conventions concerning treatment of POWs. The issue of North Korean treatment of American POWs would continue to be a topic of discussion between U.S. and North Korean representatives at Panmunjom for years to come. Both the North Koreans and the United Nations continue to maintain representatives at Panmunjom. They meet periodically to conduct negotiations on many military incidents that have occurred over the years since the armistice ending the war.	54-55
Video 2 on Truce Talks	Show video 2 on truce talks.	56
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	57
Korean War Aftermath	Explain that, encouraged by the outcome in Korea, Communist guerrillas led by Ho Chi Minh intensified their war against the French in Indochina. In 1954 the French were defeated in battle at Dien Bien Phu. This defeat resulted in the partition of Indochina into North and South Vietnam, Laos, and Cambodia. The victory emboldened the Chinese Communists, who threatened to invade Taiwan and the Nationalist-held islands of Quemoy, Matsu, and the Pescadores. However, in November, the United States signed a treaty to guard Taiwan and the Pescadores from Communist invasion. The Chinese shifted their attention to insurgencies in Indonesia, Thailand, and Malaya.	58-61
Korean War Aftermath	Explain that in 1955, the Communist Chinese threatened the Nationalist-held Tachen Islands and invaded one of the islands. President Eisenhower did not want to enter into a war with China, but he was committed to the defense of Taiwan. Consequently, he asked Congress to grant him the authority to use military force as necessary to accomplish such defense, and it was granted. Since the Tachens themselves were indefensible, the Navy undertook the evacuation all the inhabitants to Taiwan, an operation that was conducted successfully.	62
Korean War Aftermath	Explain that two post-Korean War events during the summer of 1958 illustrated the value of sea power in stabilizing a threatening situation and preventing potential war.	63
Korean War Aftermath	Explain that following a revolt in Iraq that toppled the Pro-Western government in July, Lebanese president Camille Chamoun requested U.S. military assistance to protect his country from a similar event. Within a few hours, the Sixth Fleet Carrier Striking Force was in position off Lebanon. The Amphibious Ready Group began landing Marines on the afternoon of 15 July on the beaches near Beirut Airport. The American forces were met by bikini-clad girls and ice cream vendors selling Popsicles. No insurrection took place. The situation calmed, peaceful elections were held, and the Americans withdrew.	64-66
Korean War Aftermath	Explain that although many Americans remained naïve about the action, President Gamal Abdel Nasser of Egypt and his Soviet supporters did not overlook the significance of the landing. The Soviets were forced to back down on their promises to	67-68

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	Egypt to support coup d'état attempts in the Middle East. As a consequence they lost much prestige among the Arab nations. The Lebanese operation demonstrated that the U.S. Sixth Fleet was a force-in-being capable of decisive action. That the Soviets did not have such a capability caused them to embark upon a significant naval shipbuilding program designed to remedy their weakness in the Mediterranean Sea.	
Korean War Aftermath	Explain that at the same time, the Lebanese operation was attracting so much attention—and probably not by coincidence—the Communist Chinese made new preparations to attack Quemoy, an island near the port city of Amoy still held by the Nationalists. Siege guns subjected the island to constant bombardment. Admiral Burke, the CNO at the time, anticipated a confrontation with the Chinese in Asia at the very time that the Sixth Fleet was committed in Lebanon. He placed the entire Pacific Fleet on alert and sent units of the First Fleet to reinforce the Seventh Fleet in supporting Taiwan.	69-70
Korean War Aftermath	Explain that when the Lebanese plot was defused by the swift U.S. Naval action there, the Chinese became discouraged, retreated, and tensions relaxed. This was very short-lived, for on 23 August another ferocious artillery barrage opened up on Quemoy. The United States dispatched six carriers and their supporting forces to the area, prepared to do all in their power to defend the Nationalist islands. With such support, the Nationalist air force took on the Chinese air force using new American-built planes equipped with heat-seeking Sidewinder missiles.	71-73
Korean War Aftermath	Explain that they quickly drove the Communists from the sky. U.S. Navy planes then joined the Nationalists in patrols over the Taiwan Straits. The Navy ferried supplies in to the defenders of Quemoy on amphibious craft. By September, the Navy had 150 ships operating in the Taiwan area.	74
Korean War Aftermath	Explain that the demonstrated fighting capability of the Nationalists and the heavy American Naval force were decisive in causing the Chinese Communists to reconsider their planned invasions. Admiral Nimitz wrote, “the quick assembly of the U.S. Navy’s Pacific power was the factor most responsible for averting a general war.”	75-76
Korean War Aftermath	Explain that unfortunately, provocative behavior on the part of the North Koreans did not end with the Korean War armistice. In the years since, many incidents have occurred that have shown their continued willingness to test the resolve of South Korea and the United States. One of the worst of these incidences took place in January 1968, when a U.S. intelligence-gathering ship, the <i>USS Pueblo (AGER-2)</i> , was attacked and captured by the North Koreans 15 miles off Wonsan Harbor. As had been common practice for some time, the ship was conducting routine intelligence-gathering operations in international waters off the coast of North Korea. On 23 January, the lone ship was suddenly approached by several North Korean torpedo boats and a subchaser. After several attempts to get away, during which she was continually fired upon, the <i>USS Pueblo (AGER-2)</i> was boarded and her crew was rounded up at gunpoint. The ship was then forced into Wonsan Harbor, where the crew was removed to a detention site.	77-78
Korean War Aftermath	Explain that for the next eleven months her crew of eighty-two officers, enlisted men, and civilians were held as prisoners by the North Koreans. They were often subjected to beatings to try to make them admit that they were in North Korean waters when they were captured. Only after agreeing to a false confession (which was later repudiated) was the U.S. negotiating team at Panmunjom finally able to obtain their release. The ship itself was put on display as a tourist attraction at Wonsan. This incident marked the first time in over 150 years that a U.S. warship had been captured on the high seas by a foreign power.	79-80

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Review Question	The Review Question is, “Speculate on the consequences if MacArthur had been allowed to carry the Korean War into China in 1951.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	81
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	82
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	83

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handout for take home activity – “Who’s Who?”

When: This activity should be done any time after the discussion about General MacArthur.

- Split the class in half and have the one half of the cadets write a favorable response and the other write a negative response to the question, “Was President Truman justified in firing General MacArthur?” Have cadets from each side read their arguments and the class votes at the end.

B. Take Home Activity: Who’s Who? Handout.

Cadets figure out which key player of the Korean War is being described. Discussion may follow.

IV. Evaluation - see CPS database for chapter test questions.

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Activity1: Take Home Activity – Who’s Who in the Korean War

Name: _____ Date: _____ Class: _____

Fill in the missing blanks with the key players from the Korean War. Choose from the following:
United Nations, General MacArthur, President Truman, China and North Korea.

1. _____ wanted to unite both halves of Korea under Communist rule.

2. _____ wanted to defeat the North Korean army.

3. _____ wanted to keep the UN troops away from the Chinese border so that it was less likely that China would enter the war.

4. _____ wanted the UN troops to stay away from the border between China and North Korea.

5. _____ wanted to restore peace in both North and South Korea as soon as possible.

In the space below, write a “who” statement for South Korea.

Chapter 10 / Section 4: NS2-M1C10S4 – New Naval Capabilities

(Section 4 of 6)

What Students Will Learn to Do:

Demonstrate an understanding of Naval History from the Cold War Era, 1945 – 1991

Skills and Knowledge to be Gained:

1. Describe the Navy's movement into the nuclear age
2. Describe major events in the Cuban missile crisis
3. Describe the major events which led to the breakup of Vietnam into North and South Vietnam
4. Describe the U.S. involvement in the Tonkin Gulf incident in August of 1964
5. Describe the U.S. expansion efforts in Vietnam in 1967
6. Describe the restrictions placed on military forces stationed in Vietnam

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	New Naval Capabilities (A)	Video1 New Naval Capabilities	New Naval Capabilities (B)
Video2 New Naval Capabilities	New Naval Capabilities (C)	The Cuban Missile Crisis	Check On Learning A	The Vietnam War (A)	Video1 The Vietnam War	The Vietnam War (B)	Video2 The Vietnam War
The Vietnam War (C)	Check on Learning B	The Tonkin Gulf Incident (A)	Video Tonkin Gulf Incident	The Tonkin Gulf Incident (B)	Restrictions Hinder Victory (A)	Video1 Restrictions Hinder Victory	Restrictions Hinder Victory (B)
Video2 Restrictions Hinder Victory	Restrictions Hinder Victory (C)	Video3 Restrictions Hinder Victory	Restrictions Hinder Victory (D)	Video4 Restrictions Hinder Victory	Restrictions Hinder Victory (E)	Review Questions	Closing Questions

Call for Other Questions

Key:

Textbook Content

Student Engagement and Assessment

Chapter 10 / Section 4: NS2-M1C10S4 – New Naval Capabilities

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 10. Place a checkmark beside the NS2-M1C10S4 PowerPoint presentation, and these two CPS question deck files: NS2-M1C10S4 - Key Terms and NS2-M1C10S4 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will learn that during the 10 years after the Korean War, innovations such as the hydrogen bomb, nuclear submarines, and ballistic missiles prevented major military intervention. The United States government used the Navy to stifle minor military aggression such as the Cuban missile crisis, the Lebanese operation, and the defense of Taiwan (formerly Formosa).</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-7
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Name three lessons learned from the Korean War.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on new Naval capabilities.	8
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	9

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New Naval Capabilities	Explain that although the end of the Korean War did not bring peace to a troubled world, it had positive implications for the U.S. Navy. The pre-war contention that Naval warfare was obsolete was largely discredited. The Korean War had shown that Naval shore bombardment, carrier air strikes, close air support, amphibious landings, and logistic support from the sea were all necessary parts of any military operations.	10
New Naval Capabilities	Explain that Congress thereafter authorized the building of six large Forrestal-class aircraft carriers, and plans for new classes of amphibious and mobile logistics ships were drawn up.	11
New Naval Capabilities	Explain that on 1 November 1952, a new threshold in nuclear warfare was crossed. The test explosion of the first U.S. hydrogen bomb (named “Mike”) on Eniwetok Atoll in the Pacific was the beginning of nuclear warfare. In August 1953 the Soviet Union detonated its version of the super-explosive bomb.	12
New Naval Capabilities	Explain that as President Eisenhower expanded U.S. military power to cope with the growing Soviet cold war threat, there was a greater spirit of cooperation among the Joint Chiefs of Staff.	13
Video 1 on New Naval Capabilities	Show video 1 on new Naval capabilities	14
New Naval Capabilities	Explain that the Joint Chiefs of Staff now realized that all components of the U.S. Armed Forces had a definite role in limited war, as they did in deterring possible nuclear war with the Soviet Union. This new cooperative spirit would show itself many times in various crises throughout the remainder of the cold war thereafter, when joint forces from all services would many times be called upon to protect U.S. interests around the globe.	15-16
New Naval Capabilities	Explain that approval of the new carrier construction program won for the Navy its battle to be a part of the nation’s nuclear striking force. The Forrestal class was designed to launch planes capable of carrying nuclear bombs. The difficulty of locating and neutralizing mobile nuclear-equipped carrier forces was certainly a deterrent that any aggressor would have to seriously consider.	17-18
New Naval Capabilities	Explain that while the new carriers were being built, an even more far-reaching Naval technical development occurred. Under the direction of the Navy’s hard-driving Captain (later Admiral) Hyman G. Rickover, the world’s first nuclear-powered submarine, the <i>USS Nautilus</i> put to sea in January 1955. It was soon followed by a fast-growing fleet of nuclear attack submarines. During the remainder of the twentieth century, nuclear power would become as significant to the Navy as the shift from sail to steam had been during the Civil War.	19
New Naval Capabilities	Explain that the next significant development was an intermediate-range nuclear-tipped ballistic missile named the Polaris, which could be launched from a submerged submarine. Simultaneously, a new class of submarines that could launch the Polaris was built. The <i>USS George Washington</i> went into commission in 1959 as the first of the new fleet of ballistic missile submarines.	20-21
New Naval Capabilities	Explain that these new submarines and the succession of improved missiles they would carry, would join with the Army’s land-based ICBMs (intercontinental ballistic missiles) and the Air Force’s manned bombers to become a significant leg of the nation’s triad of strategic deterrence for the balance of the century. Several classes of nuclear-powered aircraft carriers and other surface warships followed.	22
New Naval Capabilities	Explain that for much of the next three decades, U.S. nuclear attack submarines would play a major (and only recently revealed) role in the cold war at sea. Specially equipped	23

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	submarines were often sent on extended secret spy missions to monitor Soviet military communications only miles off the Soviet coasts. Others often secretly followed Soviet missile subs on their patrols, ready to sink them before they could launch their deadly cargo should war have ever broken out during these years.	
New Naval Capabilities	Explain that during the 1960s, a whole new generation of mobile logistic ships designed for underway replenishment (UNREP) joined the fleet. These had the capability of servicing whole task groups at sea at speeds up to 20 knots. Improvement in large helicopters added the new dimension of vertical replenishment (VERTREP) to mobile logistics.	24
Video 2 on New Naval Capabilities	Show video 2 on new Naval capabilities	25
New Naval Capabilities	Explain that both the Sixth Fleet in the Mediterranean and Seventh Fleet in the West Pacific receive the bulk of their stores in UNREP and VERTREP operations today.	26
New Naval Capabilities	Explain that similarly, in the 1960s and 1970s, new ships transformed the amphibious squadrons of the Atlantic and Pacific Fleets into 20-knot operational groups capable of landing a fully equipped Marine Battalion on an enemy beach. The advent of nuclear weapons required the modification of amphibious doctrine, emphasizing mobility and dispersal. The helicopter made a major impression on amphibious warfare also, with the tactic of vertical envelopment, which is the airlift of troops and equipment to landing areas behind the selected assault beach. There, they can prevent enemy reinforcements from opposing the landing and the later delivery of logistic support.	27-28
The Cuban Missile Crisis	Explain that on 14 October 1962, high-flying U-2 reconnaissance aircraft on photographic intelligence missions positively identified Soviet ICBM launching pads under construction in Fidel Castro's Cuba. Earlier photographs had shown surface-to-air missile batteries being erected and Soviet-flag freighters laden with electronic gear, construction equipment, and even suspected crated missiles being unloaded in Cuban ports. With proof of the ICBM sites confirmed, it became obvious that the Soviets were trying to overcome the superiority of America's Polaris missile submarines by placing the majority of American cities well within the 2,200-mile range of Soviet missiles.	29-32
The Cuban Missile Crisis	Explain that President Kennedy had only two choices. He could do nothing and make the United States vulnerable to Soviet nuclear blackmail or he could force the Soviets to remove the missiles, even under threat of nuclear war. After an agonizing appraisal of the alternatives, the President called upon the U.S. Navy to establish a quarantine (a type of selective blockade) of Cuba.	33
The Cuban Missile Crisis	Explain President Kennedy announced that "a strict quarantine of all offensive equipment under shipment to Cuba is being initiated, and that any ship bound for Cuba carrying such cargo would be met by the U.S. Navy and turned back."	34
The Cuban Missile Crisis	Explain that having made the decision, the President told Admiral George Anderson, then CNO, "Well, it looks as if everything is in the hands of the Navy." Admiral Anderson replied, "Mr. President, the Navy will not let you down."	35
The Cuban Missile Crisis	Explain that 21 October, during the same press conference at which the President announced the quarantine of Cuba, Kennedy told the American people and the world that the Soviet Union had placed missiles in Cuba. By 24 October, over 180 Navy ships were involved in the operation, establishing a quarantine line on an arc 500 miles to the east of Cuba. Naval vessels and aircraft continuously conducted reconnaissance missions over and around the island.	36-38
The Cuban Missile Crisis	Explain that Soviet Premier Nikita Khrushchev branded the U.S. charges as lies and warned that if America carried out any act of "piracy," the Soviet Union would react	39-41

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	accordingly. Work on the missile sites continued. Thirty thousand U.S. Marines embarked in amphibious ships near Cuba and made preparations to invade the island. Intelligence reported that twenty-five Soviet ships were on their way to Cuba and nearing the quarantine line. The question was, would they turn back, would they have to be boarded and captured, or would they have to be sunk? Tensions rose. War seemed inevitable and only hours away.	
The Cuban Missile Crisis	Explain that on the afternoon of 24 October, word was received that many of the Soviet ships had either stopped or turned back. Secretary of State Dean Rusk is reported to have remarked, “We’re eyeball to eyeball, and I think the other fellow just blinked.” On 26 October, a Soviet charter ship was stopped, boarded, searched and allowed to proceed when found not to be carrying any contraband. This established the right to stop and search suspected quarantine violators.	42-43
The Cuban Missile Crisis	Explain that later that day, President Kennedy offered to end the quarantine and promised not to invade Cuba if the Soviets would remove their missiles. Unwilling to challenge the superior American sea power, Khrushchev capitulated. Nuclear holocaust was averted, and the world breathed easier. Khrushchev’s attempt to overcome American nuclear superiority had failed. Determined leadership coupled with sea power had preserved the peace; the Navy had indeed not let the nation down. President Kennedy summed it up clearly: “Events of October 1962 indicated, as they have all through history, that control of the sea means security . . . peace . . . [and] victory. The United States must control the seas if it is to protect our security.”	44-46
The Cuban Missile Crisis	Explain that Khrushchev and the Soviet Union had been checked. As a result, the buildup of Soviet sea power that had begun after the setback in Lebanon was given top priority. The Soviet buildup moved forward with great momentum under the leadership of the Admiral of the Fleet of the Soviet Union, Sergei G. Gorshkov. By the 1970s, that momentum would give the Soviets a Navy second only to that of the United States. It was comprised of a powerful Mediterranean squadron, the world’s largest submarine force, an aircraft carrier with vertical-takeoff planes, an amphibious force with Naval infantry embarked, and impressive new merchant, oceanographic, and intelligence collection fleets as well.	47-49
The Cuban Missile Crisis	Explain that in the aftermath of the Cuban missile crisis, the United States and the Soviet Union agreed in 1963 to establish a direct communications link—the famous “hotline”—between the two governments for use in the event of a future crisis.	50
Check on Learning Questions A (Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	51
The Vietnam War	Explain that in 1972, President Nixon and Premier Brezhnev signed the Strategic Arms Limitation Treaty (SALT I), the first of several such treaties. One provision contained an antiballistic missile (ABM) defense system agreement (henceforth called the ABM Treaty). Under this treaty, no further antiballistic missile systems could be developed by either country. Another provision froze the numbers of land-based and sea-launched ballistic missiles (ICMBs and SLBMs) at then-existing levels.	52
Video 1 on the Vietnam War	Show video 1 on the Vietnam war	53
The Vietnam War	Explain that Vietnam had been a part of French Indochina since the mid-1800s, when France had acquired control of the area now comprising Vietnam, Laos, and Cambodia as a result of imperialist expansion into the region. During World War II, Vietnam was	54

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	occupied by the Japanese. Vietnam declared its independence following the Japanese defeat in 1945. The French tried to reassert their control in a war that lasted from 1946 to 1954. In that year, the French suffered a major defeat by Communist forces led by Ho Chi Minh at Dien Bien Phu, leading to complete French withdrawal two years later. After the French defeat, a Geneva accord established a demilitarized zone (DMZ) along the seventeenth parallel between North and South Vietnam, just as was done in Korea following World War II. The Communists under Ho Chi Minh were given control of North Vietnam, and South Vietnam, initially placed under French control, soon came under the control of anti-Communist Nationalists led by Bao Dai.	
Video 2 on the Vietnam War	Show video 2 on the Vietnam war	55
The Vietnam War	Explain that the partition was supposed to be temporary until free elections would unify the country two years later.	56
The Vietnam War	Explain that in 1955 a new leader, Ngo Din Diem, was chosen by Bao Dai in South Vietnam. He organized the government into the Republic of Vietnam and declared himself President. He was backed by U.S. President Dwight Eisenhower and the Southeast Asia Treaty Organization. He established his government in Saigon.	57
The Vietnam War	Explain that Communist China and the Soviet Union poured assistance into North Vietnam. Fearing that this would soon lead to expansion southward by North Vietnam, President Eisenhower offered South Vietnam military aid, including 700 advisors, and economic assistance in the amount of \$200 million a year. Initially this American aid brought great prosperity to South Vietnam.	58-60
The Vietnam War	Explain that Diem ran a corrupt and dictatorial government, composed largely of politicians and military officers who had earlier sided with the French. They carried with them a legacy of defeat and were never fully supported by the population. Ho Chi Minh, on the other hand, was regarded as a hero by most Vietnamese, both in the North and the South, because of his role in the defeat of the French. These facts would bear heavily on the eventual outcome in the embattled country.	61-63
The Vietnam War	Explain that when it came time for the 1956 elections to determine national unification and type of government, Diem, fearful of defeat at the polls, refused to allow them. Civil war flared immediately. Communist rebels in the South, called the National Liberation Front (NLF), or Vietcong, received the support of Communist North Vietnam.	64
The Vietnam War	Explain that they resorted to massacre and terrorization of the peasantry to force support of the NLF. When he took office in 1962, President John Kennedy, following the advice of the Joint Chiefs and Secretary of State Dean Rusk, decided to increase the number of American military advisers in South Vietnam to 23,000 by the middle of 1963. They soon were piloting helicopters and returning Vietcong fire.	65-66
The Vietnam War	Explain that the NLF, now reinforced by thousands of troops from North Vietnam, were spreading their control over the countryside, murdering about 500 village leaders, teachers, and businessmen each month. In response to this deteriorating situation, in November 1963 South Vietnamese military leaders staged a coup. They assassinated Diem and seized control of the government. Open involvement of the United States in the war began in August 1964, during the presidency of Lyndon Johnson.	67-69
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	70

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The Tonkin Gulf Incident	Explain that the destroyer <i>USS Maddox</i> was patrolling in the Gulf of Tonkin off the North Vietnamese coast on an intelligence mission. The ship was outside of the 3-mile limit then recognized by the United States but within the 12-mile limit claimed by North Vietnam. On 2 August, the <i>Maddox</i> was attacked by three NVN patrol boats, which fired torpedoes and machine guns at her. In the ensuing battle, one of the patrol boats was left dead in the water.	71-72
The Tonkin Gulf Incident	Explain that President Johnson ordered the destroyer to resume its patrol in the gulf as an expression of American rights to freedom of the seas. The following night, during stormy weather, another North Vietnamese torpedo attack was reported by the <i>Maddox</i> and the Destroyer <i>C. Turner Joy</i> , though later evidence seemed to indicate the alleged attack may never have occurred. In any event, the President ordered aircraft from the carriers <i>Constellation</i> and <i>Ticonderoga</i> to bomb North Vietnamese patrol boat bases and an oil storage depot in retaliation.	73-75
Video on the Tonkin Gulf Incident	Show video on the Tonkin Gulf Incident	76
The Tonkin Gulf Incident	Explain that recent investigations cast doubts on the reports of a second attack.	77
The Tonkin Gulf Incident	Two days later, Congress passed the Tonkin Gulf Resolution, which gave the President a free hand to employ necessary measures to “repel any armed attack” or “prevent further aggression.” This resolution, along with subsequent congressional financial appropriations, formed the legal basis for America’s escalating involvement in the Vietnam War.	78
The Tonkin Gulf Incident	Explain that in February 1965, after heavy American casualties were sustained in a Vietcong mortar attack on the Pleiku Air Base, President Johnson retaliated with carrier air attacks on barracks and port facilities in North Vietnam. A terrorist attack three days later killed twenty-three Americans in an enlisted men’s hotel.	79-80
The Tonkin Gulf Incident	Explain that the President now ordered the U.S. Marines to land at DaNang to protect a major air base located there. They were also to develop and defend additional bases in the northern part of South Vietnam in order to prevent North Vietnamese incursions across the DMZ. The Marines landed on 8 March and shortly thereafter joined South Vietnamese forces in “search and destroy” missions against the Vietcong.	81
The Tonkin Gulf Incident	Explain that with the commitment of the Marines, the general U.S. buildup began. Amphibious assaults and combat air support from the Seventh Fleet steadily grew in size and strength. Army combat troops arrived and took over the Chu Lai base in April 1967, while the Marines, now numbering more than 70,000, operated from a series of bases from DaNang north to the DMZ. The Marines were supported by 26,000 U.S. Navy Seabees in the northern area.	82-84
Restrictions Hinder Victory	Explain that they fought regularly against regiment-sized North Vietnamese units and thousands of Vietcong. An example of this fighting was the siege at Khe Sanh in which surrounded Marines inflicted heavy casualties on the enemy for over six months.	85-86
Video 1 on Restrictions Hinder Victory	Show video 1 on restrictions hinder victory	87

Chapter 10 / Section 4: NS2-M1C10S4 – New Naval Capabilities

Restrictions Hinder Victory	Explain that the U.S. Navy involvement was massive. The Seventh Fleet had as many as five carriers operating off “Yankee Station” in the Tonkin Gulf continuously for the next five years. Their movements were often monitored by one or more Soviet intelligence-gathering trawlers (AGIs) operating in the Gulf. Over sixty amphibious assaults were made on South Vietnamese beaches, in missions designed to eliminate pockets of Vietcong and North Vietnamese forces that had been located by intelligence. By 1968 President Johnson had committed more than half a million American servicemen to South Vietnam.	88-90
Restrictions Hinder Victory	Explain that B-52 bombers flew hundreds of massive “Rolling Thunder” bombing raids against enemy targets from bases in Guam and Thailand. In addition to these activities, the Navy also became involved with all kinds of sea-launched commando, river, and coastal patrol operations. A whole new “Brown Water Navy,” named the Mobile Riverine Force, was created. It consisted of armored monitors, armored troop carriers, and a variety of patrol and minesweeping craft. Riverine patrols roamed through the numerous canals and rivers of the Mekong Delta south and west of Saigon. Air-cushion vehicles patrolled the coastal sounds, the Plain of Reeds, and many rivers.	91-93
Video 2 on Restrictions Hinder Victory	Show video 2 on restrictions hinder victory	94
Restrictions Hinder Victory	Explain that thousands of armed helicopters and helicopter gunships zipped through the air to strike known and suspected enemy concentrations. Navy “swift boats” and Coast Guard cutters interdicted attempts by the North Vietnamese to infiltrate troops and supplies by sea in Operation Market Time. Special Forces, SEAL teams, UDTs, and Sea Commandos conducted hundreds of raids and ambushes against the elusive enemy. (Sea Commandos were highly trained Vietnamese with SEAL and U.S. Marine advisers.)	95-97
Restrictions Hinder Victory	Explain that in spite of the increased American involvement, the war dragged on for several years. There was no declaration of war by Congress, and political indecision in Washington made effective military prosecution of the war difficult if not impossible.	98
Video 3 on Restrictions Hinder Victory	Show video 3 on restrictions hinder victory	99
Restrictions Hinder Victory	Explain that many bombing restrictions in North Vietnam and prohibitions against mining North Vietnamese waters were imposed, mainly out of concern over provoking a reaction from the Soviet Union or China.	100
Video 4 on Restrictions Hinder Victory	Show video 4 on restrictions hinder victory	101
Restrictions Hinder Victory	Explain that continuous attacks by carrier and land-based aircraft along the famous Ho Chi Minh Trail, the overland Communist supply route through the Laotian and Cambodian jungles, could not stop a steady flow of combatants and material from North Vietnam. There rarely was anything resembling a battlefield. Instead, guerrillas popped up from jungles, villages, and rice fields where only moments before, peaceful-looking farmers had tended their crops.	102-103

Chapter 10 / Section 4: NS2-M1C10S4 – New Naval Capabilities

Restrictions Hinder Victory	Explain that the Chinese, Soviets, and other Communist-bloc nations kept their North Vietnamese allies amply supplied with weapons, ammunition, and equipment, mainly through the port of Haiphong. U.S. ships and aircraft were under strict orders not to fire on any “third country” shipping, even when it was observed off-loading cargo to the enemy, again out of concern over provoking the Soviets or the Chinese.	104-106
Restrictions Hinder Victory	Explain that, for a time in late 1967, it began to look as though the Communists were being beaten in the field. Then on 30 January 1968, during Tet, the Buddhist New Year, they struck at major cities all across South Vietnam. They created havoc in Saigon and held the provincial capital of Hue for twenty-five days.	107
Restrictions Hinder Victory	Explain that this “Tet Offensive” was eventually beaten back. The North Vietnamese and Vietcong suffered many casualties and gained no Communist battlefield objectives. However, the offensive birthed a peace movement in the United States which was supported by many college students and all kinds of leftists and liberals. The President found his administration under increasing pressure to get out of the Vietnam War due to the rising toll of casualties and material costs, as well as the growing protests around the country. Finally, President Johnson announced a unilateral bombing halt of North Vietnam and invited Hanoi to peace talks in Paris. He announced at the same time that he would not seek reelection.	108-111
Restrictions Hinder Victory	Explain that as the peace talks dragged on through 1969, newly elected President Nixon began withdrawing Americans from Vietnam. He insisted that America still sought the original objective, to ensure that the South Vietnamese had the right to choose and maintain their own form of government. He believed the way to attain that was to help the Vietnamese take over all aspects of their government and military operations.	112
Review Question	The Review Question is, “Give three reasons the Vietnam War was such a difficult war to win.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	113
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson with follow-up reinforcement and discussion as appropriate.	114
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	115

Chapter 10 / Section 4: NS2-M1C10S4 – New Naval Capabilities

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handouts of letter Krushev sent to President Kennedy and Kennedy's reply.

When: These activities should take place after slide 50 or upon the completion of the study of the Cuban Missile Crisis.

- Cadets will read an excerpt from the letter Krushev sent to President Kennedy discussing the removal of Cuban missiles. The letter, in its entirety, can be found at: <http://microsites.jfklibrary.org/cmc/oct27/doc4.html>
- Have a discussion based on the following questions: Discussion questions will then follow regarding the deal that was struck between the two leaders.

1. What is each side proposing?

2. What detail do you think is often left out of US History lessons regarding the Cuban Missile Crisis? Why do you think that this is so?

3. What is the tone of this letter?

4. If you were the President of the US, what would you think about this offer to settle the conflict?

B. Take Home Activity: Cadets will write a response to Krushev as though they are President Kennedy. Cadets will include what they think of his proposal. Do you agree to his proposal? Are there any other conditions that must be met? Do you offer a counter proposal?

The following day, have the Cadets read President Kennedy's response and compare their response with the actual response.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 10 / Section 4: NS2-M1C10S4 – New Naval Capabilities

Letter from Krushchev to President Kennedy

Moscow, October 27, 1962.

DEAR MR. PRESIDENT,

I understand your concern for the security of the United States...

You wish to ensure the security of your country, and this is understandable. But Cuba, too, wants the same thing; all countries want to maintain their security. But how are we, the Soviet Union, to [understand] the fact that you have surrounded the Soviet Union with military bases; surrounded our allies with military bases; placed military bases literally around our country; and stationed your missile armaments there? This is no secret. . . .Your missiles are located in Britain, are located in Italy, and are aimed against us. Your missiles are located in Turkey. You are disturbed over Cuba. You say that this disturbs you because it is 90 miles by sea from the coast of the United States of America. But you have placed destructive missile weapons, which you call offensive, in Turkey, literally next to us. I therefore make this proposal: We are willing to remove from Cuba the [missiles] which you regard as offensive. Your representatives will make a declaration to the effect that the United States, for its part, . . . will remove its [missiles] from Turkey.

We, in making this pledge, will promise not to invade Turkey. . . .The United States Government will promise not to invade Cuba . . .

The greatest joy for all peoples would be the announcement of our agreement.
These are my proposals, Mr. President.

Respectfully yours,
N. Khrushchev

Source: <http://microsites.jfklibrary.org/cmc/oct27/doc4.html>

President Kennedy's Reply

Washington, October 27, 1962

Dear Mr. Chairman:

I have read your letter of Oct. 26th with great care and welcomed the statement of your desire to seek a prompt solution to the problem. As I read your letter, the key elements of your proposals...are as follows:

- 1) You would agree to remove these weapons from Cuba under appropriate United Nations observation and supervision; and halt the further introduction of such weapons systems into Cuba.
- 2) We, on our part, would agree...a) to remove promptly the [blockade] now in effect and (b) to give assurances against an invasion of Cuba, I am confident that other nations of the Western Hemisphere would be prepared to do likewise.

There is no reason why we should not be able to complete these arrangements and announce them to the world within a couple of days. The effect of such a settlement on easing world tensions would enable us to work toward a more general arrangement regarding "other armaments", as proposed in your letter.

But the first step, let me emphasize, is the cessation (end) of work on missile sites in Cuba The continuation of this threat by linking these problems to the broader questions of European and world security, would surely [be] a grave risk to the peace of the world. For this reason I hope we can quickly agree along the lines outlined in this letter and in your letter of October 26.

John F. Kennedy

Source: <http://www.let.ruq.nl/usa/presidents/john-fitzgerald-kennedy/president-kennedy-to-chairman-khrushchev-october-27-1962.php>

Chapter 10 / Section 5: NS2-M1C10S5 – Vietnamization

(Section 5 of 6)

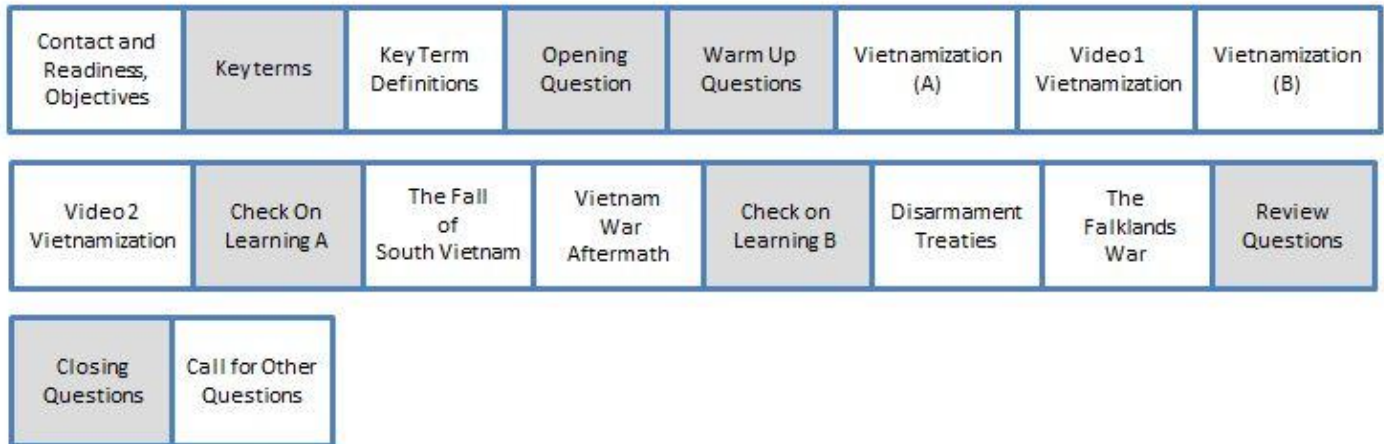
What Students Will Learn to Do:

Demonstrate an understanding of Naval history from the Cold War Era, 1945 – 1991

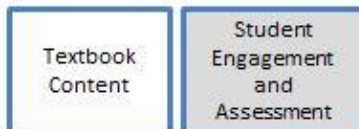
Skills and Knowledge to be Gained:

1. Describe the Vietnamization process established by the United States
2. Describe the major events that led to the end of the Vietnam War
3. Describe the events that were included in the Post-Vietnam Modernization efforts
4. Explain the significance of the 1972 Strategic Arms Limitation Treaty (SALT).
5. Describe the events that took led to the Falklands War of 1982
6. Describe the joint U.S. task force's role in Grenada during the fall of 1983

LESSON FLOW OUTLINE



Key:



Chapter 10 / Section 5: NS2-M1C10S5 – Vietnamization

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 10. Place a checkmark beside the NS2-M1C10S5 PowerPoint presentation, and these two CPS question deck files: NS2-M1C10S5 - Key Terms and NS2-M1C10S5 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons. In this lesson we will talk about the beginnings of Vietnam, the Tonkin Gulf incident, expansion of the U.S. efforts in Vietnam, the restrictions that hinder victory, Vietnamization, and the Vietnam final. We will discuss the U.S. involvement in the Falklands war and the joint U.S. task force's role in Grenada.	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-7
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "What events caused the beginning of the U.S. Sixth Fleet deployments to the Mediterranean?" Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one randomly chosen student's name or clicker number. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on the Vietnamization.	8
Warm-Up Questions(Lesson questions 1-2)	Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions. Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.	9
Vietnamization	Explain that President Nixon insisted that America still sought the original objective, that is, to ensure that the South Vietnamese had the right to choose and maintain their own form of government. He believed the way to attain the objective was to help the Vietnamese take over all aspects of their government and military operations.	10

Chapter 10 / Section 5: NS2-M1C10S5 – Vietnamization

Video 1 on Vietnamization	Show video 1 on Vietnamization.	11
Vietnamization	Explain that a massive training program called Vietnamization was undertaken to prepare the South Vietnamese to administer their affairs and operate in an effective manner. In the civilian area, training was given to local government officials, civil servants, teachers, dock managers, builders, farmers, industrialists, medical personnel, and police forces. An effort called ‘Civic Action’, financed by American tax dollars, helped in nearly every conceivable way to make the South Vietnamese self-supporting. Good roads, bridges, airports, and harbor facilities were built by the Seabees and U.S. Army and civilian engineers. One of the best internal transportation systems in Asia was created for the struggling nation.	12-15
Vietnamization	Explain that by the end of 1970, some 93 percent of South Vietnam’s population had been brought under government control from a low of only 42 percent three years prior. A succession of weak governments after Diem’s assassination had been replaced by a stable and freely elected government headed by President Nguyen Van Thieu. This government appeared to be in control of the nation’s destiny.	16
Vietnamization	Explain that on the military side, the years of training of the officer corps and noncommissioned officers by American advisers were beginning to yield results. Many elements of the South Vietnamese forces had been transformed into efficient fighting organizations. Navy, Sea Commando, and Air Force elements were considered the best, but there also were excellent Army units. A fine system of military bases and facilities, fuel dumps, communications equipment, and a huge supply system had been developed and gradually turned over to the South Vietnamese. Almost all of the riverine and patrol craft were turned over to the South Vietnamese Navy. American forces had been reduced by half by mid- 1971, and less than 150,000 were still in Vietnam by the end of that year. The Seventh Fleet started to reduce the number of ships on station.	17-19
Vietnamization	Explain that, while Vietnamization appeared to be going well, fighting flared up again in early 1972, despite the Paris peace talks that had been going on fruitlessly for nearly three years. In response to the North Vietnamese attacks, President Nixon authorized renewed bombing of North Vietnam, including Hanoi. The Communists were thrown back with heavy losses, but the fighting continued. Finally, the President authorized the mining of Haiphong Harbor. Within a week, the enemy was desperate for supplies. The Communist-bloc ships were unable to proceed into the harbor from the Gulf of Tonkin for off-loading. Two dozen ships were trapped in the harbor, unable to depart. The Communists stopped all significant military action and returned to the peace table. On 27 January 1973, all parties to the war signed an accord ending the fighting and providing for the peaceful withdrawal of the remaining American advisers by March 1973.	20-22
Video 2 on Vietnamization	Show video 2 on Vietnamization.	23
Check on Learning Questions A (Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	24
The Fall of South Vietnam	Explain that the United States made promises to support the South Vietnamese government and military forces. However, many of these promises were dependent largely on President Nixon himself. But the President, though notably successful in foreign affairs, had become embroiled in the Watergate scandal. As the Washington political scene became more and more convoluted, congressional interest in virtually everything other than the domestic political situation waned.	25

Chapter 10 / Section 5: NS2-M1C10S5 – Vietnamization

The Fall of South Vietnam	Explain that any connection with Vietnam had come to be regarded as a political liability by congressmen after the revelations of the My Lai Massacre in 1969 and the Pentagon Papers controversy in 1971. This feeling, plus the terrible cost of American involvement in the war—some 150 billion dollars and over 56,000 deaths, as well as the widespread internal political turmoil—left little support in Congress for South Vietnam.	26
The Fall of South Vietnam	Explain that President Nixon finally chose to resign in August 1974. He resigned rather than face the possibility of an impeachment trial over the Watergate affair and endure the further disruption of governmental functions an impeachment would cause. President Gerald Ford assumed the reins of government, hoping to heal the wounds of the controversy. In this atmosphere, any proposal to maintain the necessary level of financial and military aid to South Vietnam met with a severely limited response from Congress and the American people.	27
The Fall of South Vietnam	Explain that America's preoccupation with domestic political affairs encouraged the Vietcong and North Vietnamese to violate all provisions of the cease-fire agreement. They began bringing in massive reinforcements through the northern provinces of South Vietnam. In March 1975, two years after American withdrawal, South Vietnam's ability to withstand Communist pressure collapsed. By the end of April, the entire country had capitulated to North Vietnam and the NLF. Two weeks earlier, the American-supported Cambodian government had fallen to the Khmer Rouge, a fanatical Communist insurgent group in Cambodia. Laos was taken over by the Communist Pathet Lao in early December. Communism had triumphed in Indochina, after nearly thirty years of constant warfare.	28-29
Vietnam War Aftermath	Explain that after the Vietnam War, massive cutbacks took place in the numbers of Navy ships and personnel. The total number of active fleet ships dropped from about 650 in 1972 to about 450 by 1978. During the same years, the numbers of Navy personnel dropped from about 600,000 to some 525,000, and Marine Corps personnel declined from approximately 200,000 to 190,000. These downward trends continued until the early 1980s, when worldwide events such as the Falklands War, the Iran-Iraq conflict, and the rise of international terrorism caused the trend to be reversed, if only temporarily.	30-31
Vietnam War Aftermath	Explain that even before the U.S. withdrawal from Vietnam, sweeping changes were being planned in personnel policy, administration, technology, and weapons in the Navy. The old Navy bureau organization was changed in the interest of improving efficiency and keeping up with the rapid pace of technological advances to five material systems commands. These commands—Air Systems, Sea Systems, Electronics Systems, Supply Systems, and Facilities Engineering—were placed under the Chief of Naval Material. The Chief of Naval Material, along with the Chief of Naval Personnel and the Chief of the Bureau of Medicine and Surgery, reported directly to the Chief of Naval Operations.	32-34
Vietnam War Aftermath	Explain that in the early 1970's, a program to update many personnel administrative practices was initiated by Admiral Zumwalt, who was, at the age of forty-nine, the youngest CNO in the history of the Navy. He made many changes, promulgated by means of a series of directives called "Z-Grams." Beards, more liberal hairstyles, civilian clothes on liberty, motorcycles on bases, and other departures from tradition excited many of the younger people and worried older hands. In some instances, the rapid changes initiated by the new CNO caused confusion and necessitated more moderate courses of action to be adopted by later CNOs. Efforts were instituted to make the Navy more attractive to women and minorities. These met with much success after some initial setbacks.	35-38

Chapter 10 / Section 5: NS2-M1C10S5 – Vietnamization

Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	39
Disarmament Treaties	Explain that in 1972, President Nixon and Soviet Premier Brezhnev signed the Strategic Arms Limitation Treaty (SALT I), the first of several such treaties. One provision contained an antiballistic missile (small guided missiles able to intercept and destroy incoming ballistic missiles) defense-system agreement, henceforth called the ABM Treaty. Under this treaty, no further antiballistic-missile systems capable of intercepting either strategic land-launched or submarine-launched ballistic missiles (ICBMs or SLBMs) could be developed by either country. Another provision froze the numbers of ICBMs and SLBMs at then-existing levels.	40
Disarmament Treaties	These treaties had the effect of ensuring that the existing balance of power in strategic weaponry between the two countries would remain stable at then-current levels, thus reaffirming the doctrine of mutual assured destruction (MAD). MAD would serve as a deterrent to nuclear war throughout the remainder of the Cold War. This doctrine held that if both sides in a prospective nuclear war had an overwhelming number of nuclear armed ballistic missiles, the destruction of each side by the other should war erupt, would be assured, thus deterring either side from starting such a war.	41
The Falklands War	Explain that in early 1982, a major maritime event took place in the South Atlantic off the coast of Argentina. The Falkland Islands, long a subject of an ownership dispute between Britain and Argentina, were taken over by an Argentine occupation force on 2 April. In response, the British, whose colonists had occupied the Islands since 1833, gathered an invasion force consisting of two ski-jump carriers, several amphibious ships, five submarines, approximately thirty escort, auxiliaries, and support ships.	42-43
The Falklands War	Explain that the British sailed in groups from England across the South Atlantic, arriving off the Falklands in late April. For the next two months, the battle for control of the Falklands raged, involving nearly all elements of modern naval warfare. The Argentines finally capitulated on 4 June, but not before the British had lost several ships, including two frigates and a transport ship, and two air-launched Exocet missiles fired from Argentine A4 attack planes. Several others were damaged. One of the Argentines' few capital ships, the cruiser <i>General Belgrano</i> , was torpedoed and sunk by a British nuclear attack submarine.	44-46
The Falklands War	Explain that though not directly involved, the U.S. Navy benefited greatly from the lessons learned by the British during the war. Many lessons caused dramatic changes which would be implemented in our Navy. Even though they were not as capable as our large-deck carriers, the two British carriers, <i>HMS Hermes</i> and <i>HMS Invincible</i> , and their Harrier jump-jet air groups, played a major role in taking control of the air from the Argentines. Without control of the air, British victory would have been impossible.	47
The Falklands War	Explain that the action effectively quieted many skeptics in Congress who had begun to question the need for maintaining fifteen carriers and their associated support ships. It contributed to this force level being kept unchanged throughout the 1980s. Also, the 1950s and 1960s had seen a trend towards the use of aluminum instead of steel plate in the construction of ships' superstructures of most U.S. and British warships as a means of compensating for the increased weight of habitability features and new electronic gear. One of the major problems on many of the British warships hit during the Falklands campaign was uncontrollable burning of their aluminum structures. Most U.S. warships built since have incorporated steel plate wherever possible, and fire-retardant, shrapnel-resistant insulation is applied to any remaining aluminum plating used.	48-49

Chapter 10 / Section 5: NS2-M1C10S5 – Vietnamization

The Falklands War	Explain that the Falklands War demonstrated once again the value of Naval power projection capability at a time when the new Reagan administration was pushing for funds to revitalize the U.S. Armed Forces in order to reverse the post-Vietnam decline. Funding for defense, particularly the Navy, would not be a significant problem throughout the rest of the 1980s, due in no small measure to the British success in the Falklands War.	50
Review Question	The Review Question is, “List two provisions that were included in SALT.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	51
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	52
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	53

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Audio of Richard Nixon’s “Silent Majority” speech and hand out for Take Home activity

When: Any time after “Vietnamization” in the lesson

- Instructors should play the “Silent Majority” speech by Richard Nixon. Discuss what he meant by the silent majority and Vietnamization.
- The speech can be found here: <http://www.history.com/topics/us-presidents/richard-m-nixon/videos/nixon-addresses-silent-majority>

B. **Take Home Activity:** Using the handout, “Vietnam War Interview Activity”, the cadets will interview a person they know who lived during the time of the Vietnam War.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 10 / Section 5: NS2-M1C10S5 – Vietnamization

Activity1: At Home Activity – Vietnam War Interview Activity

Name: _____ Date: _____ Class: _____

Directions: Interview your parents, your grandparents, or other adults who remember the Vietnam War and find out what they thought about the United States' involvement in this war. The people you interview should be old enough to be aware of the situation in Vietnam and to have developed opinions about it. Ask the following questions and add one or two questions of your own.

- Where were you living in 1969? How old were you?
- What do you remember reading or seeing about the Vietnam War?
- What did you think about the Vietnam War in the 60's and 70's? Why did you have this opinion?
- What did you think of President Nixon during the Vietnam conflict? Why did you have this opinion?
- How did you feel about the military draft? Why did you feel this way? Did you know anyone who was drafted into the military?
- What is your opinion today of the Vietnam War? Has your opinion changed since the 1960's and 1970's? Why or why not?
- What lessons do you think our country learned or should have learned from our experience in the Vietnam War?
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Chapter 10 / Section 6: NS2-M1C10S6 – Grenada and Panama

(Section 6 of 6)

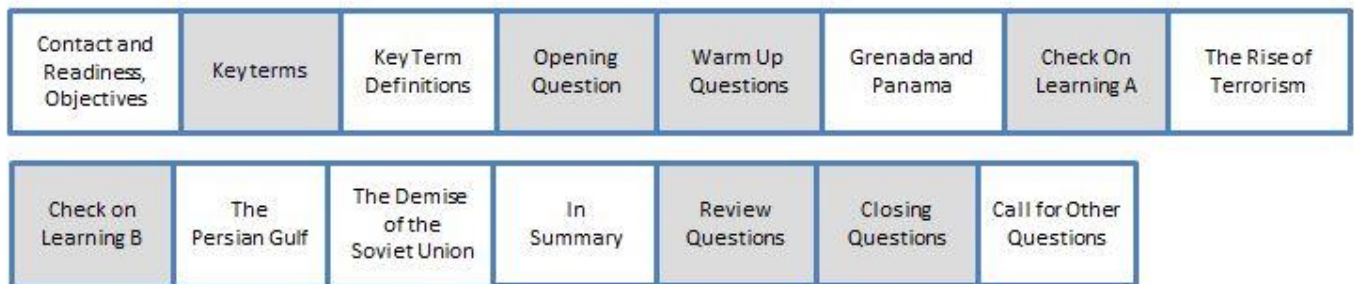
What Students Will Learn to Do:

Demonstrate an understanding of Naval history from the Cold War Era, 1945 – 1991

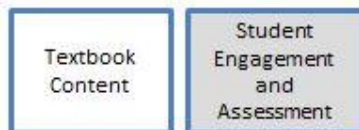
Skills and Knowledge to be Gained:

1. Describe the role the United States played in restoring democracy to Panama and the importance of Operation Just Cause to U.S. interests in Panama
2. Describe the rise of worldwide terrorism with events in the Middle East during the 1980s
3. Describe the major events that occurred between Iran and Iraq in the Persian Gulf region
4. Describe the great changes experienced by the Soviet Union since 1985 and the rapid rise of the democratic movement within the Soviet Union after the demolition of the Berlin Wall

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 10. Place a checkmark beside the NS2-M1C10S6 PowerPoint presentation, and these two CPS question deck files: NS2-M1C10S6 - Key Terms and NS2-M1C10S6 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 10 / Section 6: NS2-M1C10S6 – Grenada and Panama

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will talk about restoring democracy in Panama and the importance of <i>Operation Just Cause</i> to U.S. interests in Panama. We will describe the rise of worldwide terrorism and the events in the Middle East during the 1980s. This involves Iran and Iraq in the Persian Gulf region. We will finish the lesson with a discussion on the great changes experienced by the Soviet Union since 1985 and the rapid rise of the democratic movement within the Soviet Union after the demolition of the Berlin Wall.</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “List 2-3 reasons for the fall of the Soviet Union.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the fall of the Soviet Union.	7
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	8
Grenada and Panama	Explain that in late October 1983, in response to a takeover of the Caribbean island nation of Grenada by Cuban-backed Communist forces, a joint U.S. task force with elements of all services conducted a major amphibious operation and took control of the island in three days. Forces from several nearby Caribbean Allied island governments also took part in the operation. In the process, about 600 American citizens, mostly students attending medical school there, and 80 foreign nationals were evacuated to safety. Later, U.S. forces helped the Grenadians reestablish their representative government and rebuild damaged buildings and other facilities.	9-10
Grenada and Panama	Explain that relations between the United States and Panama steadily deteriorated throughout the 1980s. By 1988, the country had become a major staging area for drug smuggling to the United States. The country’s dictator, General Manuel Noriega, was indicted on drug-trafficking charges by a U.S. federal grand jury. In response, the Noriega government became increasingly belligerent toward U.S. interests there, causing the United States to impose economic sanctions in retaliation. In May 1989, a national election voted Noriega out of power, but he refused to accept the result and had the vote annulled.	11-13

Chapter 10 / Section 6: NS2-M1C10S6 – Grenada and Panama

Grenada and Panama	Explain that in December 1989, following a series of incidents that culminated in the killing of a U.S. Marine Lieutenant by Panamanian Defense Force (PDF) troops, the Noriega government declared that a state of war existed between the United States and Panama. Early in the morning hours of 20 December 1989, President Bush sent a combined invasion force of 12,000 U.S. Army, Navy, Air Force, and Marine Corps troops to remove Noriega and return the country to the control of the officials who had been lawfully elected in May. These forces joined another 12,000 U.S. military personnel, mostly Army, already stationed in the Panama Canal Zone.	14
Grenada and Panama	Explain that the intervention, called <i>Operation Just Cause</i> , was the largest U.S. military operation in the 1980s. Some fierce fighting occurred at times, but rapid envelopment by coordinated airborne and armored U.S. forces quickly overcame most PDF strongholds. By the end of the incident, most military objectives had been achieved, and only scattered pockets of resistance remained. Noriega, himself managed to elude capture and sought refuge at the Vatican's diplomatic mission in Panama City. He eventually surrendered to U.S. authorities in January 1990. Noriega was later transported to the United States, where he is presently serving a prison sentence after being convicted on drug-trafficking charges.	15-17
Grenada and Panama	Explain that the successful intervention restored democracy to Panama, and, despite many protestations by neighboring Central American countries at the time, U.S. interests in the region have been more secure since.	18
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	19
The Rise of Terrorism	Explain that one of the more unfortunate trends that marked the 1980s was the rise of worldwide terrorism, especially in connection with events in the Middle East. Principal among these events was the Iran-Iraq War, which lasted most of the decade. Of only slightly less importance was the issue of a homeland for the Palestinian Arabs, which caused almost continuous strife between Israel and neighboring Arab states. Many of the more extreme Arab groups involved in both struggles, unable to challenge Israel and the Western nations with military interests in that area, turned to international terrorism to advance their causes. Since many of the terrorist acts involved U.S. allies or U.S. citizens or both, our armed services, especially the Navy and Marine Corps, were asked to respond to several of the crises—but not always with beneficial results.	20-22
The Rise of Terrorism	Explain that one of the most tragic events occurred after a Marine force was asked to join the UN peacekeeping effort in Lebanon in 1983. On 23 October a suicide bomber driving a truck full of explosives attacked the headquarters building at Beirut Airport housing some of the peacekeeping force. This resulted in the deaths of 241 Marines and Naval personnel housed in the building at the time.	23
The Rise of Terrorism	Explain that other terrorist actions during the 1980s included the taking of civilian and military hostages of U.S. and several other Western nationalities, car bombings, assaults against civil facilities such as airports and train stations, and airliner bombings and hijackings. In the early part of the decade, a number of these actions were shown to have been directly sponsored by Libyan leader Colonel Muammar Qaddafi, who had established several terrorist training bases within Libya. In the mid-1980s, Qaddafi began to make threats concerning freedom of navigation in the Gulf of Sidra in the Mediterranean off Libya's northern shore. There were several incidents involving U.S. Naval air and surface forces, during which Libyan fighters were shot down and Libyan patrol boats were sunk.	24-26

Chapter 10 / Section 6: NS2-M1C10S6 – Grenada and Panama

The Rise of Terrorism	Explain that finally, on 15 April 1986, in retaliation for the continuing threats and several Libyan-sponsored terrorist acts against U.S. citizens in Europe, and with the agreement of most of our European allies, a combined attack was carried out against Libyan terrorist support bases. Air Force F-111s based in England struck army barracks and an airport near Tripoli and the port of Sidi Bilal. Carrier-based A-7s and A-6s attacked other barracks at Ben-ghazi and an airfield at Benina. Qaddafi, himself narrowly missed being killed during the course of these raids, in which only two U.S. Air Force F-111 crewmen were lost. The attack had a dramatic effect on reducing Libyan-sponsored terrorism throughout the world.	27-29
The Rise of Terrorism	Explain that unfortunately, it has often proven difficult to take much effective action against acts of terror, especially in the Middle East. Perpetrators from these countries are often elusive, and they operate from ever-changing bases of operation, so it is difficult to target effective reprisals directly against them. Many times in the 1980s and since, Americans and other Western hostages have been used as pawns in the power struggles of a significant number of these terrorists. Death threats, threats of future hostage taking, and threats to reduce or cut off oil exports to offending nations have been routinely made to counter any suggestion of reprisal attacks against the terrorists' sponsor countries.	30
The Rise of Terrorism	Explain that this situation prompted what came to be known in the United States as the Iran-Contra affair in the mid-1980s. In this incident, a series of illegal arrangements was secretly made by several naval and other government officials that had the effect of supplying arms to Iran in exchange for help in obtaining the release of several American hostages. Some of the profits from the deal were then used to provide arms for the U.S.-favored Contra revolutionaries in Nicaragua. A key figure in this affair was Marine Colonel Oliver North, who was later found guilty of, essentially, overstepping the bounds of his authority in the matter.	31-33
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	34
The Persian Gulf	Explain that in September 1980 a war began between Iran and Iraq that would progress through several phases until August 1988, when a truce was negotiated that would end most of the open warfare. Though the proximate cause of the war was a longstanding border dispute, there had also been many years of previous political and ethnic tension between the two countries. The first years of the war turned into a war of attrition, during which neither side was able to achieve significant inroads into the territory of the other, despite many casualties on both sides. During much of the conflict from the mid-1980s onward, the war erupted into much of the Persian Gulf, with each side trying to disrupt the oil tanker trade of the other and thereby gain economic advantage.	35-36
The Persian Gulf	Explain that soon tankers of all nations transiting the gulf, especially the Strait of Hormuz, were subject to air and mine attacks by both nations. Because of our political posture in the area, the United States has generally assumed the role of peacemaker. This was perhaps because we are somewhat less dependent on Middle Eastern oil than most other Western nations and therefore less vulnerable. The United States played a major role in keeping the Persian Gulf open for transit by oil tankers of all nations during the latter stages of the Iran-Iraq War. Throughout 1987 and 1988 U.S. frigates and cruisers served as convoy escorts, accompanying and protecting tankers transiting the gulf.	37-38

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The Persian Gulf	Explain that these operations were not conducted without cost. In May 1987, the frigate <i>USS Stark (FFG-31)</i> was attacked and hit by two Exocet missiles launched from an Iraqi aircraft while the ship was on radar picket duty in the Gulf. In April 1988, the <i>USS Samuel B. Roberts (FFG-58)</i> was almost cut in two by a mine but was saved by the damage-control efforts of her crew. Then, on 3 July 1988, an unfortunate incident demonstrated the limitations of even the most modern equipment in this type of situation. The Aegis cruiser <i>USS Vincennes (CG-49)</i> , in the middle of a battle against Iranian gunboats in the Strait of Hormuz, mistakenly shot down a civilian Iranian airliner that approached the ship in a seemingly threatening manner over the strait. All 290 people aboard the plane died.	39-40
The Persian Gulf	Explain that many mine warfare ships, mainly in our Naval Reserve fleet, engaged in mine-clearing operations following the end of hostilities in the gulf. These operations continued until early 1990, at which time all the mines released by both sides during the war were considered to have been neutralized.	41
The Demise of the Soviet Union	Explain that the Soviet economy, never very strong since World War II, had been suffering more and more from both low productivity and lack of modern technology in the 1980s. Much of this state of affairs resulted from restrictive Communistic policies concerning private property and the accumulation of personal wealth and an emphasis on military spending. These, in conjunction with years of cold war military posturing and provocative foreign policy had severely limited any infusion of money and technology from the West.	42
The Demise of the Soviet Union	Explain that both as a means of internal economic reform and to try to win favor with Western nations, soon after he came to power in 1985, the Soviet Premier Mikhail Gorbachev initiated a series of liberal reforms and policies collectively called <i>Glasnost</i> (new openness in foreign relations) and <i>Perestroika</i> (internal political and economic reforms). In 1987, an important bilateral arms-reduction agreement called the <i>INF (Intermediate-range Nuclear Forces) Treaty</i> was negotiated between the United States and USSR that reduced many tensions. It eliminated intermediate-range nuclear missiles (those with ranges between 300 and 3,400 miles) in Europe. Relations with Western nations were also improved by many state visits, summit meetings, and further arms control negotiations conducted throughout the late 1980s, and by a loosening of controls over the satellite states of Eastern Europe that had been dominated by the Soviet Union since World War II.	43-45
The Demise of the Soviet Union	Explain that all of Gorbachev's domestic reforms proved to be insufficient to hold back a rising tide of democracy that, once set in motion, rapidly engulfed the Soviet Union. The populations of the satellite states took advantage of the erosion of Soviet control to press forward successful self-determination movements. These eventually resulted in complete independence by 1990 of all the former satellite states.	46
The Demise of the Soviet Union	Explain that perhaps the most important and surely the most emotional symbol of the new European order occurred in November 1989 with the demolition of the Berlin Wall. The Berlin Wall had divided East and West Berlin in Germany for thirty years and symbolized the repression of the satellite nations behind the so-called iron curtain. Germany itself was formally reunited a year later. The Warsaw Pact alliance between the USSR and the former satellite nations was disbanded in February 1991.	47-48
The Demise of the Soviet Union	Explain that most amazing to most Western analysts was the rapid rise of the democratic movement within the Soviet Union itself. Simultaneously with the loss of the satellite states, people in most of the republics making up the Soviet Union staged their own demonstrations for self-rule. Quickly rising to the foremost position was the	49-50

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	Russian republic, led by Boris Yeltsin, who only a few years earlier (1988), had been thrown out of the Soviet Politburo for urging Gorbachev to proceed more quickly with the liberalization program.	
The Demise of the Soviet Union	Explain that things came to a head in August 1991, when the remaining old-line Communists in the Politburo attempted to stage a coup. They arrested Gorbachev and detained him and his family for three days at his vacation home on the Crimean Peninsula on the Black Sea. The Soviet Army, however, declined to support the coup and refused to attack the Russian Parliament building in Moscow, from which Yeltsin was leading the opposition to the coup. The overwhelming support for both Yeltsin and Gorbachev from the people of Moscow, and indeed the whole Soviet Union, proved decisive. Within days, the situation was fully resolved. Gorbachev was returned to Moscow and the coup leaders were arrested.	51
The Demise of the Soviet Union	Explain that Yeltsin had now become the most powerful leader in the disintegrating Soviet Union. In early December, he made the dissolution official by proclaiming the existence of a new Commonwealth of Independent States made up of the former Soviet republics. On Christmas Day 1991, Gorbachev resigned and the Soviet Union was formally dissolved. The red, white, and blue pre-revolutionary Russian flag was raised over the Kremlin.	52-53
The Demise of the Soviet Union	Explain that the Cold War was over. The Western democracies, led by the United States, had successfully prevailed against almost fifty years of challenge from Soviet communism.	54
In Summary	1945 World War II ends 1946 Churchill "Iron Curtain" speech 1947 Unification of U.S. forces 1947 Truman Doctrine and Marshall Plan 1949 NATO created 1950-53 Korean War 1955 Warsaw Pact created; Nautilus launched 1958 China attacks Quemoy 1962 Cuban missile quarantine 1964-73 Vietnam War 1968 Pueblo incident 1975 Mayaguez incident 1980-88 Iran-Iraq War 1982 Falklands War 1983 Granada invasion 1986 Attack on Libyan terrorists 1989 Panama invasion 1991 Cold War ends; USSR disbanded	55-57
Review Question	The Review Question is, "List 2-3 reasons why the efforts to limit size and armaments of warships during this time period were futile." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	58
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	59
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	60

Chapter 10 / Section 6: NS2-M1C10S6 – Grenada and Panama

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Picture of the Berlin Wall and handout for Take Home Activity

When: This activity should be done prior to the lesson to introduce the idea of the Berlin Wall.

- In Class: Project a picture of the Berlin Wall and have as discussion using the following questions:
 - What do you notice?
 - Why do you think the wall is painted? What kinds of things might it say?
 - Why are there people standing on top of the wall? What do you notice about them? What tone does their presence send?
 - Why are there people standing outside the wall? What might they be doing?
 - Why do you think this wall is there? Why do people build walls?
 - What would it be like if there was a wall dividing your town?

B. Take Home Activity: Using the handout “Berlin – A Time Line”

Have the cadets read the article: <http://ezinearticles.com/?A-Short-History-of-the-Berlin-Wall&id=3332332> and create a time of the events that are mentioned in the article.



Tech Tip:

This site <http://www.berlin.de/mauer/verlauf3d/index.en.html> is a 3D look at the Berlin Wall so that students can grasp its enormity.

Here, <http://www.historyplace.com/speeches/reagan-tear-down.htm>, you can hear Reagan’s “*Tear Down This Wall*” speech.

IV. Evaluation - see CPS database for chapter test questions.



Chapter 10 / Section 6: NS2-M1C10S6 – Grenada and Panama

Activity 1: Take Home Activity- Berlin – A Time Line

Name: _____ Date: _____ Class: _____

Read the article from this link:

[http://ezinearticles.com/?A-Short-History-of-the-Berlin Wall&id=3332332](http://ezinearticles.com/?A-Short-History-of-the-Berlin-Wall&id=3332332)

Create a time of the events that are mentioned in the article.

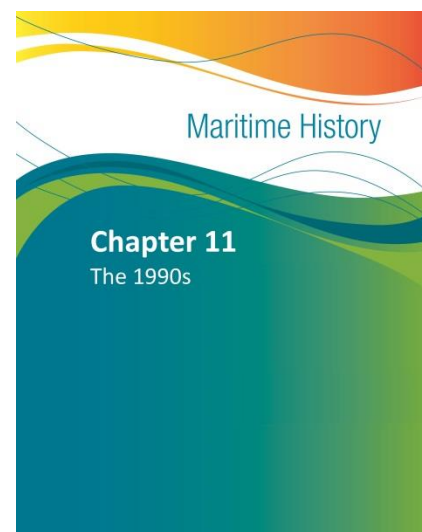
Module 1 Chapter 11: NS2-M1C11 – The 1990s

What Students Will Learn to Do:

Demonstrate an understanding of naval history from the 1990s and beyond

Skills and Knowledge to be Gained:

1. Describe the terms of START II signed by the U.S. and Russia in 1993
2. Describe the major events that occurred between Iran and Iraq in the Persian Gulf region
3. Describe the major events that occurred during both operations Desert Shield and Desert Storm
4. Describe some of the actions taken by the U.S. in the aftermath of Desert Storm
5. Describe the events that took place in the Balkans from 1991 – 1995
6. Describe the conflicts that took place in Somalia, India, Pakistan and China during the 1990s
7. Explain the U.S. efforts in the war on drugs during the 1990s
8. Describe international terrorist events that occurred in the late 1990s
9. Describe the domestic terrorist events that occurred in the late 1990s



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...
- RI.9-10.9. Analyze seminal U.S. documents of historical and literary significance...

Writing

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.7. Conduct short as well as more sustained research projects to answer a question or solve a problem...
- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking & Listening

Module 1 Chapter 11: NS2-M1C11 – The 1990s

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.3. Apply knowledge of language to understand how language functions in different contexts...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Civic and Political Institutions

- D2.Civ.5.9-12. Evaluate citizens' and institutions' effectiveness in addressing social and political problems at the local, state, tribal, national, and/or international level.
- D2.Civ.9.9-12. Use appropriate deliberative processes in multiple settings.
- D2.Civ.12.9-12. Analyze how people use and challenge local, state, national, and international laws to address a variety of public issues.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...
- D2.His.14.9-12. Analyze multiple and complex causes and effects of events in the past.
- D2.His.16.9-12. Integrate evidence from multiple relevant historical sources and interpretations into a reasoned argument about the past.

D3. Gathering and Evaluating Sources

- D3.4.9-12. Refine claims and counterclaims attending to precision, significance, and knowledge conveyed through the claim...

Dimension 4. Communicating Conclusions and Taking Informed Action

- D4.2.9-12. Construct explanations using sound reasoning, correct sequence, examples, and details with significant and pertinent information and data...
- D4.7.9-12. Assess options for individual and collective action to address local, regional, and global problems by engaging in self-reflection, strategy identification, and complex causal reasoning.
- D4.8.9-12. Apply a range of deliberative and democratic strategies and procedures to make decisions and take action in their classrooms, schools, and out-of-school civic contexts.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 11 / Section 1: NS2-M1C11S1 – Middle East Conflicts

(Section 1 of 3)

What Students Will Learn to Do:

Demonstrate an understanding of Naval history from the 1990s and beyond

Skills and Knowledge to be Gained:

1. Describe the terms of START II signed by the U.S. and Russia in 1993
2. Describe the major events that occurred between Iran and Iraq in the Persian Gulf region
3. Describe the major events that occurred during both operations Desert Shield and Desert Storm
4. Describe some of the actions taken by the U.S. in the aftermath of Desert Storm

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Warm Up Questions	Russia and the Former Soviet Union	The Middle East (A)	Video1 The Middle East
The Middle East (B)	Video2 The Middle East	Check On Learning A	Operations Desert Shield and Desert Storm (A)	Video1 Operations Desert Shield and Desert Storm	Operations Desert Shield and Desert Storm (B)	Video2 Operations Desert Shield and Desert Storm	
Operations Desert Shield and Desert Storm (C)	Video3 Operations Desert Shield and Desert Storm	Video4 Operations Desert Shield and Desert Storm	Operations Desert Shield and Desert Storm (D)	Video5 Operations Desert Shield and Desert Storm	Operations Desert Shield and Desert Storm (D)		
Video6 Operations Desert Shield and Desert Storm	Video7 Operations Desert Shield and Desert Storm	Operations Desert Shield and Desert Storm (E)	Video8 Operations Desert Shield and Desert Storm	Check on Learning B	Aftermath of Desert Storm	Review Questions	
Closing Questions	Call for Other Questions						

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 11 / Section 1: NS2-M1C11S1 – Middle East Conflicts

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 11. Place a checkmark beside the NS2-M1C11S1 PowerPoint presentation, and these two CPS question deck files: NS2-M1C11S1 - Key Terms and NS2-M1C11S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons. In this lesson, we will discuss how the Navy supported the conflicts during Desert Shield and Desert Storm.	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “List three things you know about Iraq.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the 1990s.	7
Warm-Up Questions(Lesson questions 1-2)	Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions. Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.	8
Russia and the Former Soviet Union	Explain that the end of the Cold War in 1991 brought with it a greatly diminished threat of nuclear warfare between superpowers. Still, there were many serious issues that would concern the U.S. Navy and the other U.S. Armed Services for the remainder of the decade and into the new millennium.	9
Russia and the Former Soviet Union	Explain that immediately upon taking over the leadership of the former Soviet states that comprised the new Commonwealth, President Boris Yeltsin found himself faced with several very serious problems. Most important were the issues of revitalizing the economies of Russia and the other former Soviet states, what to do with the armed forces, and how to control of the formidable Soviet nuclear arsenal.	10

Chapter 11 / Section 1: NS2-M1C11S1 – Middle East Conflicts

Russia and the Former Soviet Union	Explain that in pursuit of economic support for his new Commonwealth, Yeltsin immediately established friendly working relations with Western Heads of State. After assurances that he now controlled the nuclear weapons, the United States and other Western nations started sending much aid in various forms.	11-12
Russia and the Former Soviet Union	Explain that in January 1993, President Bush and Yeltsin signed the second Strategic Offensive Arms Reduction and Limitation Treaty (START II), considered the broadest disarmament pact in history. Its terms called for both sides to reduce long-range nuclear arsenals to between 3,000 to 3,500 warheads within a decade. The Treaty also called for the complete elimination of land-based multiple-warhead missiles. Many nuclear missiles on both sides have since been dismantled and destroyed, and the process was still ongoing into the new millennium.	13-14
Russia and the Former Soviet Union	Explain that in late 1996, Yeltsin announced that from that time on, no Russian-controlled nuclear missiles would remain aimed toward any of the Western states. In early 1997, President Clinton announced that several of the former Soviet satellite states would soon be permitted to join the North Atlantic Treaty Organization (NATO). The Czech Republic, Hungary, and Poland did so in 1999. Only a few years earlier, such an idea would have seemed incredible to most in the West.	15-16
The Middle East	Explain that the peace in the Persian Gulf area following the end of the Iran-Iraq War in 1988 unfortunately proved to be short-lived. With his forces no longer engaged in the war with Iran, Iraq's leader Saddam Hussein was free to attempt other more aggressive military adventures to the south.	17
The Middle East	<p>Explain that in August 1990, suddenly and without warning, Iraqi forces under the command of Iraq's leader Saddam Hussein staged a brutal invasion of neighboring Kuwait. Kuwait was captured quickly, as were thousands of Western civilian oil-field workers and their families. These civilians were then detained and used as hostages against Western reprisal.</p> <p>Explain that Saudi Arabia, fearful of becoming the next victim of Hussein's aggression, quickly appealed to the United Nations and especially to its ally, the United States, for help.</p>	18
Video 1 on The Middle East	Show video 1 on the Middle East.	19
The Middle East	Explain in an unprecedented show of unanimity against such aggression, the UN passed a trade embargo against Iraq, restricting movement and sale of all goods, including oil and food products, into and out of Iraq.	20
Video2 on The Middle East	Show video 2 on the Middle East.	21
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	22
Operations Desert Shield and Desert Storm	Explain that in response to the Iraq invasion, the United States embarked upon Operation Desert Shield, deploying to Saudi Arabia the largest U.S. Military and Naval Force assembled since the Vietnam War.	23
Operations Desert Shield and Desert Storm	Explain that by the end of 1990, about 450,000 U.S. military personnel and 100 U.S. Navy ships were engaged in operations in support of Desert Shield. Forces from many other nations also joined U.S. Forces there to form the so-called UN coalition.	24

Chapter 11 / Section 1: NS2-M1C11S1 – Middle East Conflicts

Video 1 on Operation Desert Shield and Desert Storm	Show video 1 on Operation Desert Shield and Desert Storm.	25
Operations Desert Shield and Desert Storm	Explain that U.S. and allied ships patrolled in the Persian Gulf, Arabian Sea, and Red Sea, enforcing the UN trade embargo against Iraq. Among the forces deployed in the Saudi desert were thousands of U.S. Marines. Navy hospital ships largely staffed with Naval Reserve medical personnel deployed off the Saudi coasts, ready to handle any casualties. Maritime sealift transported the bulk of the heavy equipment and supplies needed to sustain the operation.	26-27
Operations Desert Shield and Desert Storm	Explain that the UN Security Council imposed a deadline of 15 January 1991, by which time Hussein had to move all of his forces out of Kuwait or face military action. Hussein did not leave Kuwait.	28
Video 2 on Operation Desert Shield and Desert Storm	Show video 2 on Operation Desert Shield and Desert Storm.	29
Operations Desert Shield and Desert Storm	Explain that on 16 January a massive air assault on every target of military significance in Iraq and Kuwait turned Operation Desert Shield into Desert Storm. Tens of thousands of air sorties (attack missions) were launched by U.S. Navy, Army, and Air Force planes and helicopters and those of other coalition forces. The coalition soon achieved air superiority and quickly shot down any offensive-minded Iraqi aircraft that managed to get airborne.	30
Video 3 on Operation Desert Shield and Desert Storm	Show video 3 on Operation Desert Shield and Desert Storm.	31
Video 4 on Operation Desert Shield and Desert Storm	Show video 4 on Operation Desert Shield and Desert Storm.	32
Operations Desert Shield and Desert Storm	Explain that on 23 February, the allied ground offensive into Kuwait and southern Iraq began.	33
Video 5 on Operation Desert Shield and Desert Storm	Show video 5 on Operation Desert Shield and Desert Storm.	34
Operations Desert Shield and Desert Storm	Explain that the U.S. and coalition forces were under the overall command of General H. "Stormin' Norman" Schwarzkopf, U.S. Army. The United States and coalition forces made short work of the now demoralized Iraqi troops, most of whom had been heavily bombed by the air campaign and cut off from all resupply of food and munitions.	35-36
Video 6 on Operation Desert Shield and Desert Storm	Show video 6 on Operation Desert Shield and Desert Storm.	37

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Video 7 on Operation Desert Shield and Desert Storm	Show video 7 on Operation Desert Shield and Desert Storm.	38
Operations Desert Shield and Desert Storm	By 26 February, Kuwait City was secured and on the evening of 27 February, President Bush announced a cease-fire. The cease-fire became permanent on 8 April. Victory for the coalition forces was complete, thus ending the largest air and ground offensive fought since World War II.	39
Video 8 on Operation Desert Shield and Desert Storm	Show video 8 on Operation Desert Shield and Desert Storm.	40
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	41
Aftermath of Desert Storm	Explain that tens of thousands of Iraqi troops were killed as the result of air and ground attacks and many thousands more became prisoners of war. U.S. losses were amazingly low by any measure: 89 combat deaths, 38 missing in action, and 212 wounded. Ultimately, more than 527,000 U.S. Military Personnel were in the theater of operations, including 82,000 U.S. Navy men and women and 94,000 Marines.	42
Aftermath of Desert Storm	Explain that following the end of hostilities in Operation Desert Storm in Iraq in February 1991, Iraqi leader Saddam Hussein devoted much effort to reestablishing control over his country. Part of this effort involved the suppression of ethnic Shiite Moslems in southern Iraq.	43
Aftermath of Desert Storm	Explain that in August 1992 U.S., British, and French warplanes began enforcing a UN-imposed no-fly zone (an area over which hostile aircraft are prohibited from flying) over the southern part of Iraq, designed to protect the Shiites from further attacks by Hussein.	44-45
Aftermath of Desert Storm	Explain that along with the no-fly zones, economic sanctions (frozen bank assets, for example) and trade embargoes (naval blockade, for example) had been enacted by the UN to force Hussein to liberalize the treatment of the Iraqi people and to comply with the 1991 cease-fire agreement regarding the inspection of potential munitions-producing plants and Chemical, Biological, and Radiological (CBR) weapons facilities.	46
Aftermath of Desert Storm	Explain that in August 1996, there was much concern over a threatening movement of some 45,000 troops and 300 tanks toward UN-protected Kurdish-held territory in northern Iraq. In response, President Clinton ordered a joint U.S. Navy–Air Force strike against Iraqi air defense systems and bases in the southern part of the country.	47-48
Aftermath of Desert Storm	Explain that on 3 and 4 September, some forty-four land-attack Tomahawk cruise missiles (TLAMs) were launched from four surface ships and an SSN in the Persian Gulf, and two B-52 bombers from Guam. The bombers also launched thirteen air-launched cruise missiles (ALCMs). All Iraqi air defense targets were hit, but no target was completely destroyed. Nevertheless, Hussein appeared to have “gotten the message,” and the troops and tanks were withdrawn shortly thereafter.	49-50

Chapter 11 / Section 1: NS2-M1C11S1 – Middle East Conflicts

Review Question	The Review Question is, “In what ways are economic sanctions useful during a crisis?” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	51
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	52
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	53

III. Supplemental Activities –

A. In Class Activity:

Supplies required: Large bucket, pie tin, and at least 12,000 BBs (2 bottles of 6,000).

Place the pie tin in the bucket upside down so that the BBs dropped on the tin and collect in the bucket, not the pie tin. Picture of Hiroshima and Nagasaki (with printable handouts; Handout for take home activity

When: This is a good activity to do at the beginning of class.

- With the class: Talk to the class about nuclear weapons and the effects. Show them the 2 images of the destruction on Hiroshima and Nagasaki. Explain that the weapon dropped on Hiroshima contained between 13–18 kilo tons of TNT and the weapon dropped on Nagasaki contained between 20-22 kilo tons of TNT. Today's modern nuclear weapons are capable of about 100 times the explosive power of either of these first 2 bombs. These two powerful bombs were 100 times more powerful than the weapons being deployed today (100 million tons of TNT). Make sure the students understand the difference in yield. The standard 500 lbs. bomb used today yields only about 200 lbs. equivalent TNT. So, it would take roughly 20,000 500 lbs. bombs to equal the destruction of the bomb on Nagasaki.
- Now, have all the students close their eyes. Drop 1 BB onto the pie tin. Tell the class that is the sound of 100 Hiroshima or Nagasaki bombs going off. Remind the students to keep their eyes closed and just imagine the destruction of 100 of those bombs going off. Tell the student that they will now hear roughly the combined destructive power that the United States and the USSR had prior to the Start treaty. Start dropping the 12,000 BBs on the pie tin. Slowly at first and then speed it up. Do not pour too quickly in the beginning so the students can hear the individual dropped BBs.
- Class question: Self-reflection for 2 minutes.... Recommend not saying anything for the 2 minutes after the last BB is dropped. This was the concept of Mutually Assured Destruction (MAD). We will talk about the reduction of the number of nuclear weapon during this lesson.

Chapter 11 / Section 1: NS2-M1C11S1 – Middle East Conflicts

B. Take Home Activity: We have discussed how the United States, along with a coalition of other countries, worked together to free Kuwait from Iraq. Today, the United States is again working with other countries to achieve a common goal.

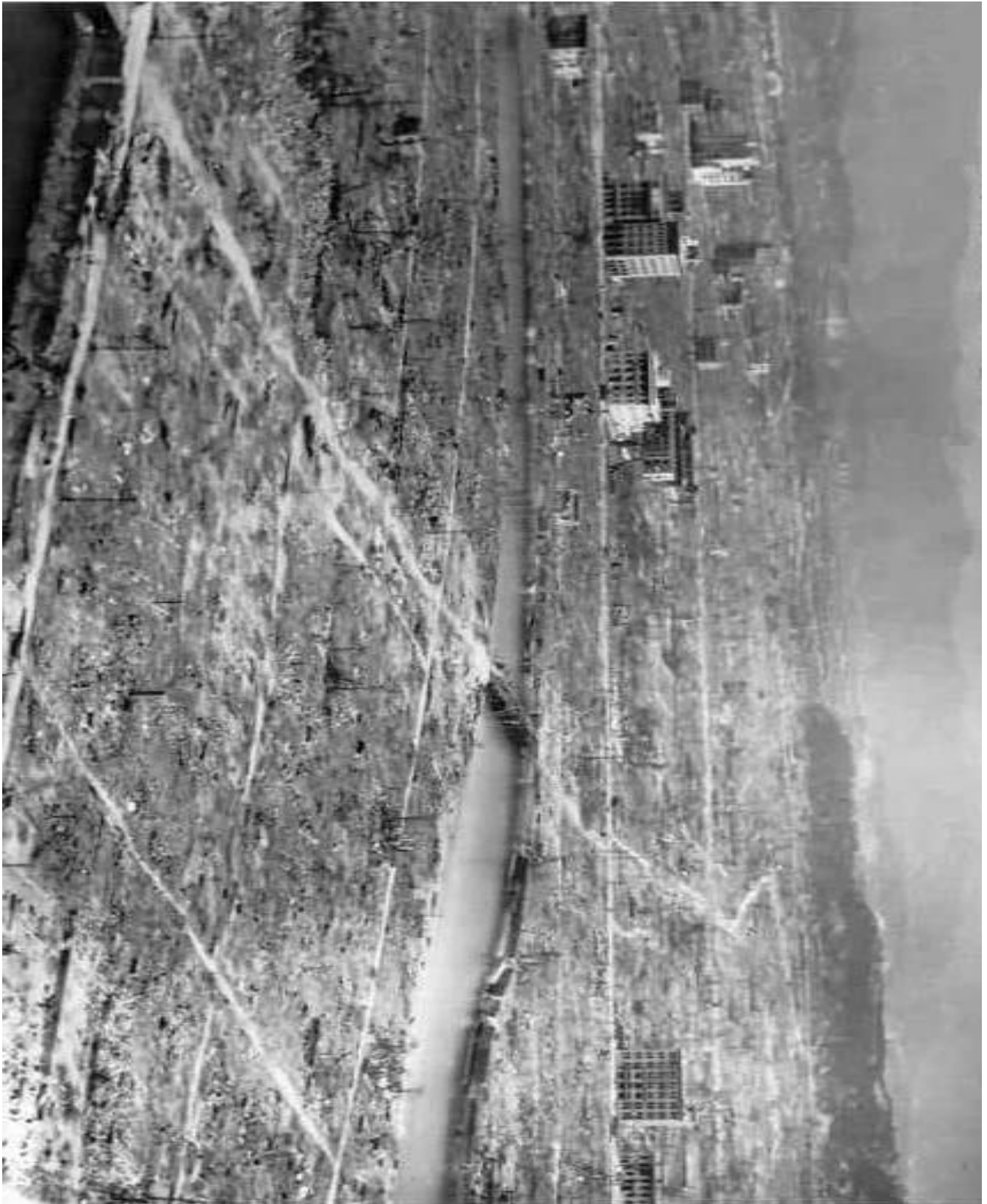
Have the cadets research an operation that the U.S. Navy is currently working with other countries in support of international law or UN resolution. Using the handout “Navy Contributions”, write a report on the operation describing the United States contribution to the operation.

This research should help the students understand the contribution of the U.S. Navy in resolving issues around the world. The research should also prepare the students for chapter 12.

IV. Evaluation - see CPS database for chapter test questions.

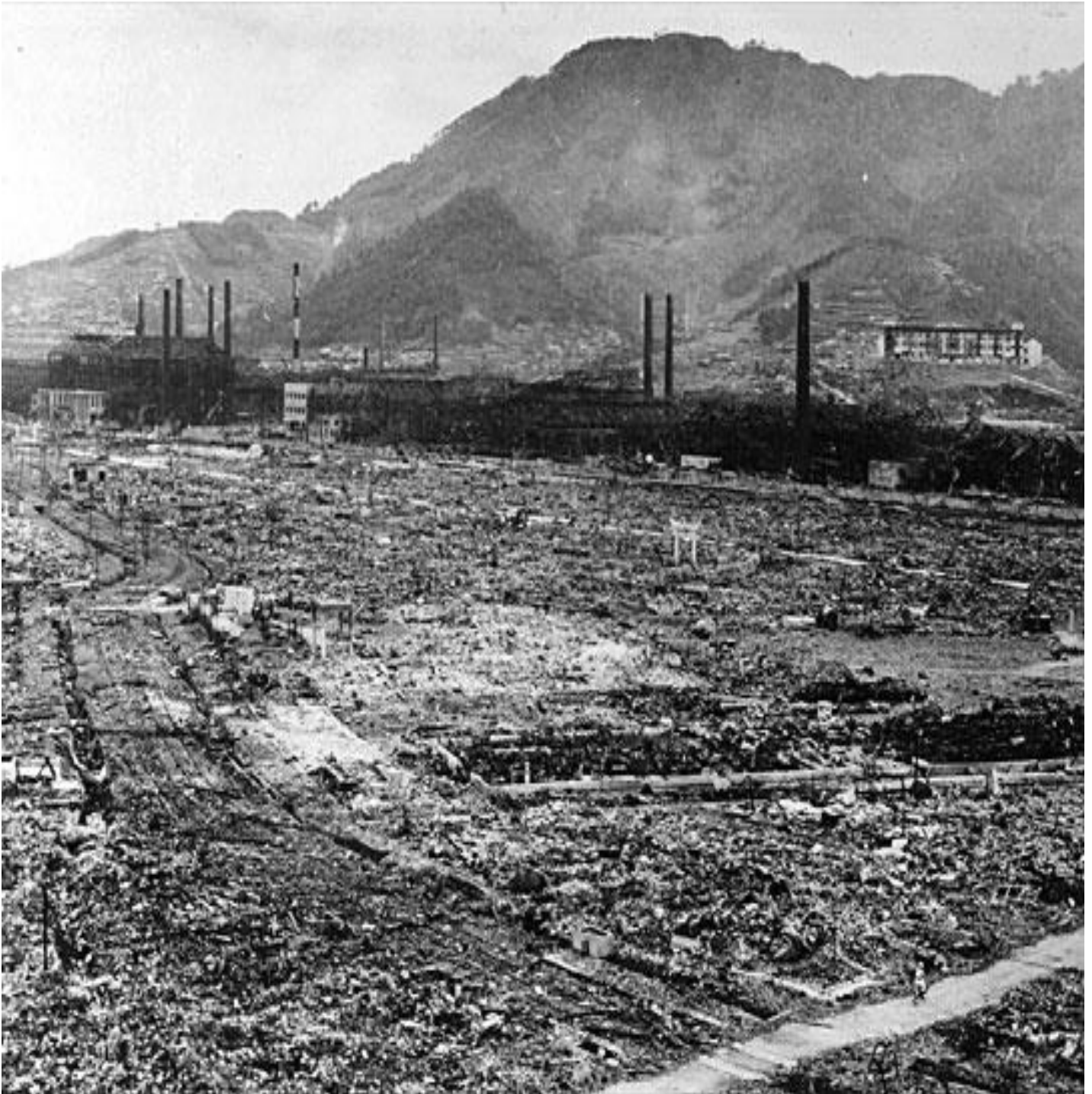
Chapter 11 / Section 1: NS2-M1C11S1 – Middle East Conflicts

HIROSHIMA



Chapter 11 / Section 1: NS2-M1C11S1 – Middle East Conflicts

NAGASAKI



Chapter 11 / Section 1: NS2-M1C11S1 – Middle East Conflicts

Activity 1: Take Home Activity- Navy Contributions

Name: _____ Date: _____ Class: _____

Directions: We have discussed how the United States, along with a coalition of other countries, worked together to free Kuwait from Iraq. Today, the United States is again working with other countries to achieve a common goal.

Research an operation that the U.S. Navy is currently working with other countries in support of international law or UN resolution. Write a report on the operation describing the United States contribution to the operation.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Chapter 11 / Section 2: NS2-M1C11S2 – Conflict in the Balkans

(Section 2 of 3)

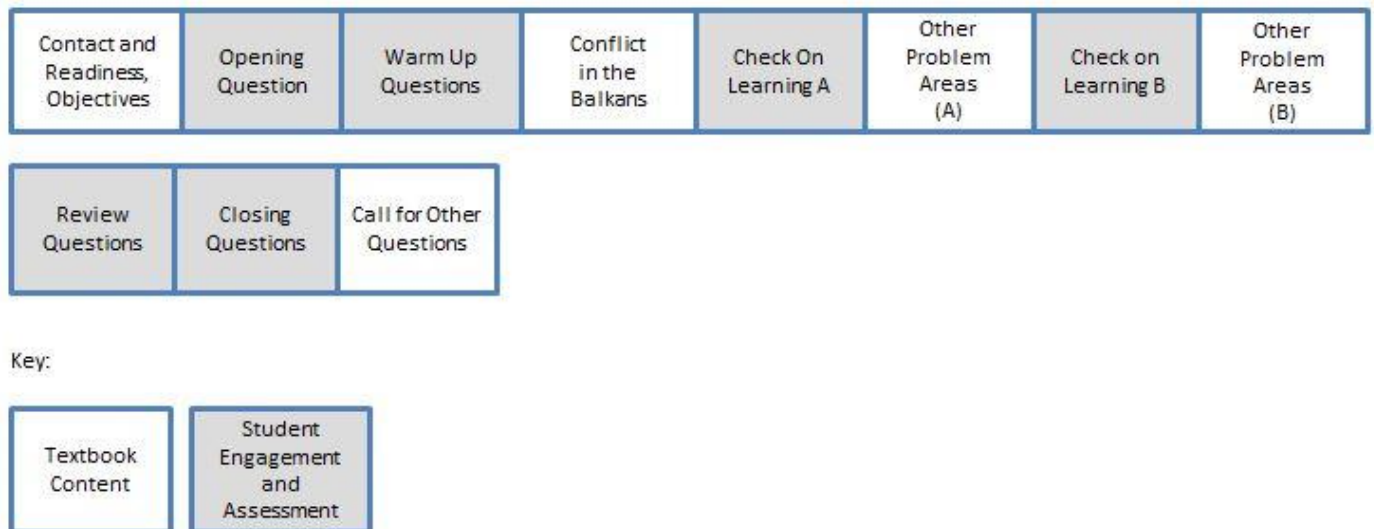
What Students Will Learn to Do:

Demonstrate an understanding of Naval history from the 1990s and beyond

Skills and Knowledge to be Gained:

1. Describe the events that took place in the Balkans from 1991 – 1995
2. Describe the conflicts that took place in Somalia, India, Pakistan and China during the 1990s

LESSON FLOW OUTLINE



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 11. Place a checkmark beside the NS2-M1C11S2 PowerPoint presentation, and these two CPS question deck files: NS2-M1C11S2 - Key Terms and NS2-M1C11S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 11 / Section 2: NS2-M1C11S2 – Conflict in the Balkans

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will talk about the U.S. involvement in the Balkans from 1991-1995, along with the conflict in Somalia and the problems that took place in India, Pakistan, and China.</p>	1-3
Opening Question(Random Pick a Student – “RPS”)	<p>This Opening Question is, “List three things you know about Civil War.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the conflict in the Balkans.</p>	4
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	5
Conflict in the Balkans	<p>Explain that unfortunately, after the demise of the Soviet Union, conflict broke out in several of the countries formerly under Soviet control. In 1991, a civil war began in the Baltic country of Yugoslavia, once a client state of the Soviet Union. Yugoslavia’s six republics—Slovenia, Croatia, Bosnia-Herzegovina, Serbia, Montenegro, and Macedonia—began to break apart for two reasons: (1) economic difficulties caused by the end of Soviet aid, and (2) longstanding friction between ethnic groups in its population.</p>	6-9
Conflict in the Balkans	<p>Explain that in June 1991, after Croatia and Slovenia declared their independence from the former Yugoslavia, fighting broke out between ethnic Serbs in Croatia who claimed part of that republic for Serbia, and the Croat militia. Soon the conflict broadened into Bosnia-Herzegovina, between Serbs who claimed part of that republic as well, and Muslims and Croats, who claimed the rest.</p>	10
Conflict in the Balkans	<p>Explain that months of bloody fighting continued with atrocities on all sides. In late 1991, the UN imposed an oil, trade, and weapons embargo against Yugoslavia (which was supplying troops and arms to the Serbs) and Serbia in an attempt to end the fighting. The embargo had little effect and the fighting and atrocities continued. Economic sanctions against Serbia and Montenegro were imposed the following May, also with little effect. By the end of 1992, the situation had deteriorated to the point that Yugoslavia ceased to exist as a separate nation for a time.</p>	11-13
Conflict in the Balkans	<p>Explain that in October 1992, the UN established a no-fly zone prohibiting flights of military aircraft over Bosnian air space, which was extended to cover all types of aircraft in early 1993. The UN also proclaimed so-called safe areas around several</p>	14-17

Chapter 11 / Section 2: NS2-M1C11S2 – Conflict in the Balkans

	cities, including the nearly leveled city of Sarajevo in southeastern Bosnia, control of which had been a strategic objective of both sides in the conflict. Air Force planes and Navy ships and carrier- and land-based aircraft helped NATO forces enforce the embargo, no-fly zones, and safe areas, but President Clinton was reluctant to introduce ground troops into the conflict. Instead, he preferred diplomatic pressure. Beginning in 1992, at least one Navy carrier battle group and a Marine Amphibious Ready Group were continually stationed in the Adriatic Sea, both to support Navy operations and as a show of force.	
Conflict in the Balkans	Explain that fighting continued for two more years until late 1995, when the United States joined other NATO forces under the auspices of the United Nations to try to bring a halt to the conflict by a heavier application of force. In August and September 1995, in <i>Operation Deliberate Force</i> , Navy and Marine Corps planes from the carrier Theodore Roosevelt joined with NATO aircraft from an airbase at Aviano, Italy, to conduct air strikes against Serb military positions south and east of Sarajevo.	18-19
Conflict in the Balkans	Explain that these strikes were in retaliation for the Serbs overrunning the UN-protected cities of Srebrenica and Zepa and mortar attacks on Sarajevo that killed and wounded more than eighty civilians. NATO struck back. A total of 3,500 sorties were flown against 350 separate targets.	20-21
Conflict in the Balkans	Explain that finally, in December 1995, the Presidents of Bosnia-Herzegovina, Serbia, and Croatia signed a treaty to end the war. It was negotiated in Dayton, Ohio, with much involvement of the U.S. State Department. The pact divided Bosnia into two largely autonomous parts. NATO agreed to deploy some 60,000 troops, including 20,000 U.S. Army troops, in Bosnia for at least a year to maintain the peace. This force was gradually reduced to about 7,000 troops by year-end 2004, at which time it was formally replaced by an equal number of troops from the European Union.	22-25
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	26
Other Problem Areas	Explain that problems broke out in other areas of the world as well. In January 1991 a civil war erupted in the former Soviet-aligned African state of Somalia after the cessation of aid from the former Soviet Union, when several clan-led rebel armies forced longtime President Mohammed Siad Barre to flee the country. In his absence several of these groups began battling among themselves for territory, soon resulting in widespread anarchy and famine. The situation was particularly acute because nearly every adult male in the country possessed at least one firearm due to the supply of weapons remaining there from the old Soviet Union.	27-29
Other Problem Areas	Explain that in December 1992, 28,000 U.S. troops, including 1,800 Marines, took part in the UN-sponsored <i>Operation Restore Hope</i> , which was intended to bring in food supplies and restore some order to the country. Assisted by units of the French Foreign Legion, the Marines patrolled the streets of Mogadishu, the country's capital. They deployed from four ships that had sailed there from the U.S. Navy base at Diego Garcia in the Indian Ocean, and were joined by a covering carrier battle group from the Persian Gulf.	30-32
Other Problem Areas	Explain that although clan warlords signed a peace accord in March 1993, sporadic violence continued, and finally in October, following a gun battle between U.S. soldiers and clan members that left eighteen dead and approximately seventy-five wounded, President Clinton set March 1994 as the date by which all remaining U.S. Forces would withdraw from the country. About 2,000 Marines were kept offshore for several months thereafter as potential cover for the remaining UN troops.	33-35

Chapter 11 / Section 2: NS2-M1C11S2 – Conflict in the Balkans

Other Problem Areas	Explain that in mid-1996, Navy-Marine Corps Amphibious Ready Groups were called upon on two occasions to assist in evacuation of U.S. nationals and other noncombatants from the African nations of Liberia and the central African Republic of Bangui.	36
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	37
Other Problem Areas	Explain that both Liberia and the central African Republic of Bangui were experiencing outbreaks of ethnic violence, famine, and disease. The Marines also reinforced the U.S. embassy in Monrovia, Liberia, during that crisis.	38-40
Other Problem Areas	Explain that in the spring of 1998, much apprehension arose over the issue of nuclear weapons proliferation when India and Pakistan each exploded nuclear test devices in response to the other doing so. Escalating conflict between the two nations that might have led to a regional nuclear war was halted only by the diplomatic efforts of the Clinton Administration acting in conjunction with the United Nations. Fortunately, both nations were deterred from continuing on a course that could have led to nuclear destruction of both sides. The issue of nuclear nonproliferation continues to be a major international concern.	41-43
Review Question	The Review Question is, "List reasons that it is important for the U.S. to monitor worldwide nuclear capabilities." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	44
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	45
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	46

Chapter 11 / Section 2: NS2-M1C11S2 – Conflict in the Balkans

III. Supplemental Activities -

A. In Class Activity:

Supplies required: 2 Cue Cards made in advance* bag of jelly beans divided in thirds. Reward** see note at the end of this section.

When: This is a good activity to do at the beginning of class.

- With the class: Divide the class into 2 teams. Each team is given their card and 2 minutes to determine what they want to do as a team. Both teams are also told that there are outside teams who want the jelly beans as well.

Cue card for team 1:	Cue card for team 2:
<ul style="list-style-type: none">• You want to maintain the most jelly beans• You may trade or give jelly beans with team 2• If your team maintains 3/4 of all the jelly beans, you will receive 1 candy bar per member for team 1• At the end of the game your team will be able to divide the jelly beans up between your team members• Do not share any of this information with team 2	<ul style="list-style-type: none">• You want to gain control of all the jelly beans• You may trade or give jelly beans with team 1• If your team maintains 1/2 of all the jelly beans you will receive 1 candy bar per member for both teams• At the end of the game your team will be able to divide the jelly beans up between your team members• Do not share any of this information with team 1

- After the 2 minutes, have a representative from each group make a proposal to the other group to try and get the other team's jelly beans. The groups have 30 seconds to accept or decline the proposal or they must come up with a counter proposal.
- Give the groups 1 more minute to come up with any new proposals. Have each group present their new proposal. They have an additional 30 seconds to decide to take the proposal or not.

See if either group met the winning criteria and reward them.

- Class question: If no one negotiated a candy bar, ask why not? Did either team trust the other team to be working for the benefit of both teams? Why? Why don't countries trust other countries? Why do countries fall into civil war?

* Note: you can use anything for the reward vice jelly beans and candy such as extra credit, no homework pass, or anything that your students would want.

Chapter 11 / Section 2: NS2-M1C11S2 – Conflict in the Balkans

B. Take Home Activity 1: Today, we learned about several countries that had civil wars and political unrest that greatly affected the country's population. Write an essay stating your opinion on the following: should the United States be involved in other countries internal affairs? Is it, or is it not, the responsibility of the citizens of the United States to protect those freedoms that we hold so important to our way of life for others around the world? How does giving aid to those in need in these countries affect that country's stability?

Alternative

B. Take Home Activity 2: Today we talked about several countries that the US became involved in their internal struggles. The United States has been involved in many operations throughout the world. On a world map, plot the locations where the U.S. has committed significant U.S. Military forces or resources. For each location, state what the U.S. did, when, and why.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 11 / Section 3: NS2-M1C11S3 – Drug Trafficking

(Section 3 of 3)

What Students Will Learn to Do:

Demonstrate an understanding of Naval history from the 1990s and beyond

Skills and Knowledge to be Gained:

1. Explain the U.S. efforts in the war on drugs during the 1990s
2. Describe international terrorist events that occurred in the late 1990s
3. Describe the domestic terrorist events that occurred in the late 1990s

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Drug Trafficking	Check On Learning A	International Terrorism
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Check on Learning B	Domestic Events	In Summary	Review Questions	Closing Questions	Call for Other Questions
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Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 11. Place a checkmark beside the NS2-M1C11S3 PowerPoint presentation, and these two CPS question deck files: NS2-M1C11S3 - Key Terms and NS2-M1C11S3 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 11 / Section 3: NS2-M1C11S3 – Drug Trafficking

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will talk about the war on drugs and the international terrorist attacks against the U.S. the late 1990s. We will cover the terrorist events that took place on U.S. soil, September 11, 2001.</p> <p>Finally we will discuss the serious non-battle or operational issues that face the Navy today.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “List 2-3 reasons why controlling the flow of illegal drugs into the U.S. is so difficult.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on drug trafficking.	6
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	7
Drug Trafficking	Explain that throughout the 1990s and beyond, all services within the U.S. Defense Department and the Coast Guard have been called upon to support both international and domestic efforts to suppress the illegal drug trade. In the 1990s, drug producers in South America increasingly transported their drugs to the United States by way of Central America.	8-9
Drug Trafficking	Explain that traffickers used boats, low-flying aircraft, and tractor-trailers hauling legal cargo in which to smuggle drugs bound for American markets. In response, all Services have lent support with their various intelligence agencies worldwide. They also have conducted joint drug-interdiction training exercises with host nation forces, particularly in Central and South America. Ground radar and airborne surveillance assets of the Navy and other services have also been used to track and intercept boats and aircraft suspected of drug smuggling.	10-12
Drug Trafficking	Explain that on the domestic scene, all services conduct extensive drug awareness and testing programs designed to discourage the use of all illegal drugs and other substances by service personnel.	13

Chapter 11 / Section 3: NS2-M1C11S3 – Drug Trafficking

Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	14
International Terrorism	Explain that in early August 1998, U.S. embassies in Kenya and Tanzania were virtually destroyed by terrorist car bombs. These attacks were determined by U.S. intelligence services to have been masterminded by a wealthy, exiled Saudi Arabian terrorist by the name of Osama bin Laden. This man had proclaimed a holy war against the United States for its part in the action against Iraq in the early 1990s.	15-17
International Terrorism	Explain that in retaliation for the bombings, on 20 August 1998, President Clinton ordered cruise missile attacks to be carried out against two targets - terrorist training camps run by bin Laden in Afghanistan and a factory in Sudan believed to be involved in manufacturing chemical weapons for the terrorist leader. Over seventy Tomahawk missiles were fired during the attacks by U.S. Navy ships in the Persian Gulf and in the Red Sea. Though he was thought to have been present at the Afghanistan site at the time of the attack, bin Laden escaped injury and continued to be a major terrorist threat against the United States and U.S. interests until he was killed by American Forces in a raid on Pakistan on May 2, 2011	18-19
International Terrorism	Explain that in August 2000, the guided missile destroyer <i>USS Cole (DDG-67)</i> while in port in Aden, Yemen, for a routine fuel stop, had a large hole blown in her port side by a bomb-laden boat crewed by two suicide bombers. Seventeen U.S. Sailors were killed and thirty-nine others were injured in the blast. The terrorists conducting the attack were subsequently linked to bin Laden. The damaged ship was transported back to the Ingalls Shipyard in Pascagoula, Mississippi, aboard a civilian transport ship. On 19 April 2002, after a successful 14-month effort to repair the damage suffered in the terrorist attack, <i>USS Cole</i> returned to its homeport of Norfolk.	20-22
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	23
Domestic Events	Explain that the 1990s proved to be turbulent times at home as well, both for the Navy and other Armed Services. In response to the end of the cold war threat, a downsizing and consolidation of forces among all U.S. Armed Services began, which was still in progress into the new millennium. Added to the natural pressures caused by this were several unfortunate incidents of both actual and alleged sexual misconduct brought to national attention by the news media. Chief among these were allegations of harassment of female junior officers and civilians by over 100 male Naval aviators attending an annual convention sponsored by the Tailhook Association at the Las Vegas Hilton in September 1991. Further allegations included incidents of fraternization with and harassment of female trainees by male drill instructors that surfaced at an Army training base at Aberdeen, Maryland, in late 1996. The tension caused by these and other scandals involving sexual harassment was felt throughout the military services.	24-27
Domestic Events	Explain that the issue of how best to fully integrate women into the U.S. Armed Services has yet to be completely resolved, though much progress has been made in recent years.	28
Domestic Events	Explain that in April 1995, the threat of domestic terrorism was again highlighted when a powerful bomb exploded in front of the Federal Building at Oklahoma City, Oklahoma, killing and maiming scores of innocent people. In July a year later, a bomb detonated at the 1996 Olympic Games in Atlanta, Georgia, killing one person and	29-31

Chapter 11 / Section 3: NS2-M1C11S3 – Drug Trafficking

	injuring several others. In the same month came the explosion of TWA Flight 800 off the coast of Long Island, New York that killed all 230 passengers and crew.	
Domestic Events	Explain that Navy divers participated in a salvage operation that lasted until late fall 1996 and eventually resulted in the recovery of most of the bodies of those killed and most of the wreckage of the plane. The wreckage was assembled and analyzed to try to determine the cause of the explosion. At first it was thought that terrorism may have played some part in the incident, but it was later determined that the most likely cause of the explosion was an electrical discharge into a vapor-filled fuel tank.	32-33
In Summary	<div> <div>Aug. 1990</div> <div>Iraq invades Kuwait</div> </div> <div> <div>Jan. 1991</div> <div>Operation Desert Storm</div> </div> <div> <div>June 1991</div> <div>War in Bosnia begins</div> </div> <div> <div>Aug. 1992</div> <div>Iraqi no-fly zone imposed</div> </div> <div> <div>Dec. 1992</div> <div>Operation Restore Hope</div> </div> <div> <div>Apr. 1995</div> <div>Oklahoma federal building bombed</div> </div> <div> <div>July 1996</div> <div>TWA Flight 800 salvage</div> </div> <div> <div>Sept. 1996</div> <div>Missile attack on Iraq</div> </div> <div> <div>Aug. 1998</div> <div>Attack on bin Laden terrorist base</div> </div> <div> <div>Aug. 2000</div> <div>Attack on USS Cole</div> </div>	34-35
Review Question	The Review Question is, “Discuss ways that international terrorism would be fought vs. domestic terrorism.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	36
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	37
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	38

Chapter 11 / Section 3: NS2-M1C11S3 – Drug Trafficking

III. Supplemental Activities -

A. In Class Activity:

Supplies required: MOBI or white board; handout for take home activity

When: This is a good activity to do either before or after the drug trafficking section.

- Divide the class into two groups. One group comes up with ways to smuggle drugs into the country, the other groups creates ways to prevent that method. The smugglers' group has 30 seconds to come up with a method and then present it. The enforcers now have 30 seconds to come up with two methods for stopping the smuggling. Repeat the process. Remember that the enforcer methods already put into place can be used for any new or previously existing smuggling method.
- Class question: How hard is it to come up with these ideas? Do you, the class, think that you are as creative as the actual smugglers? Just think of all the ingenious ways that the smugglers have developed that we have not even discussed. If it is this easy to come up with methods in which to sneak drugs into the country, how hard would it be to smuggle in other items, bombs, weapons, and people? How important is the ability of the federal government to control our borders and to control entry into the United States?

B. Take Home Activity: Have the students research the largest drug busts and seizures made by the US Navy. Using the handout, Navy Drug Busts, have them list the top five in monetary value and top five in weight. Also have them respond to the question, "When the US Navy made the bust were they working for the Navy, Coast Guard, or some other agency or country?"

IV. Evaluation - see CPS database for chapter test questions.

Chapter 11 / Section 3: NS2-M1C11S3 – Drug Trafficking

Activity 1: Take Home Activity- Navy Drug Busts

Name: _____ Date: _____ Class: _____

Directions: Research the largest drug busts and seizures made by the US Navy. List the top five in monetary value and top five in weight.

Answer the question: When the US Navy made the bust were they working for the Navy, Coast Guard, or some other agency or country?

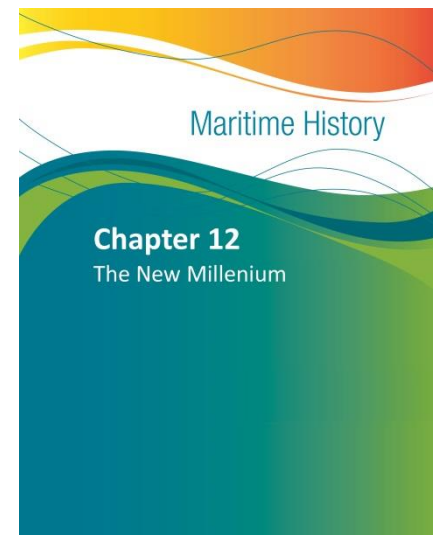
Module 1 Chapter 12: NS2-M1C12 – The New Millennium

What Students Will Learn to Do:

Demonstrate an understanding of naval history in the new millennium

Skills and Knowledge to be Gained:

1. Describe the new, often nontraditional, missions for Navy and Marine Corps
2. Explain the effects of funding and budget
3. Describe critical events of the New Millennium and their effects on the U.S. military
4. Describe the attack on USS Cole in 2000
5. Describe the China and Navy P-3 incident
6. Describe and explain the 2001 terrorist attack on the United States
7. Explain Operation Enduring Freedom in 2001
8. Explain Operation Iraqi Freedom in 2003
9. Explain Operation Unified Assistance in 2004
10. Explain the Maersk Alabama piracy incident in 2010
11. Explain other significant international events in 2010
12. Describe humanitarian missions in Haiti and Japan in 2010 and 2011
13. Describe the mission to capture Osama bin Laden in 2011
14. Explain the Arab Spring revolts in 2011
15. Discuss the issues around the antiballistic missile (ABM).
16. Discuss the relationship and issues between the United States and North Korea in the new millennium.
17. Discuss terrorism and violent extremist which has become prevalent in our world.
18. Discuss the concept of cyber warfare, and why it is important.
19. Discuss some of the equipment military equipment issues and their impact and significant deployments.
20. Explain how personnel issues have impacted the U.S. military in recent years.
21. Discuss how current issues will shape the military in the coming years.



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

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- RI.9-10.3. Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them.

Writing

- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.9-10.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.3. Apply knowledge of language to understand how language functions in different contexts...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Civic and Political Institutions

- D2.Civ.5.9-12. Evaluate citizens' and institutions' effectiveness in addressing social and political problems at the local, state, tribal, national, and/or international level.
- D2.Civ.6.9-12. Critique relationships among governments, civil societies, and economic markets.
- D2.Civ.12.9-12. Analyze how people use and challenge local, state, national, and international laws to address a variety of public issues.

Dimension 2. Geography

- D2.Geo.10.9-12. Evaluate how changes in the environmental and cultural characteristics of a place or region influence spatial patterns of trade and land use.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...
- D2.His.14.9-12. Analyze multiple and complex causes and effects of events in the past.
- D2.His.15.9-12. Distinguish between long-term causes and triggering events in developing a historical argument.

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Dimension 3. Gathering and Evaluating Sources

- D3.4.9-12. Refine claims and counterclaims attending to precision, significance, and knowledge conveyed through the claim while pointing out the strengths and limitations of both.

Dimension 4. Communicating Conclusions and Taking Informed Action

- D4.6.9-12. Use disciplinary and interdisciplinary lenses to understand the characteristics and causes of local, regional, and global problem...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 12 / Section 1: NS2-M1C12S1 – The Global War on Terrorism

(Section 1 of 3)

What Students Will Learn to Do:

Demonstrate an understanding of Naval history in the 21st Century

Skills and Knowledge to be Gained:

1. Describe the new, often nontraditional, missions for Navy and Marine Corps
2. Explain the effects of funding and budget
3. Describe critical events of the New Millennium and their effects on the U.S. military
4. Describe the attack on U.S.S. Cole in 2000
5. Describe the China and Navy P-3 incident
6. Describe and explain the 2001 terrorist attack on the United States
7. Explain Operating Enduring Freedom in 2001
8. Explain Operation Iraqi Freedom in 2003
9. Explain Operation Unified Assistance in 2004

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	Early Events	Terrorist Attacks of 11 Sept 2001
Check On Learning A	Operation Enduring Freedom	Check on Learning B	Operation Iraqi Freedom	Operation Unified Assistance	Review Questions	Closing Questions	Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 12 / Section 1: NS2-M1C12S1 – The Global War on Terrorism

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 12. Place a checkmark beside the NS2-M1C12S1 PowerPoint presentation, and these two CPS question deck files: NS2-M1C12S1 - Key Terms and NS2-M1C12S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons. In this lesson we will learn about the nontraditional missions for the U.S. Navy and Marine Corps as we moved into the twenty-first century. We will learn about the changes to the Navy due to budget cuts and increased threats. Finally, we will cover the terrorist events that took place in the United States on September 11, 2001 and what happened as a result.	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-10
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Which American landmarks were hit by planes on 11 September 2001 and which landmark was an intended target?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the introduction to the new millennium.	11
Warm-Up Questions(Lesson questions 1-2)	Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions. Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.	12
Introduction	Explain that the advent of the new millennium would mark the beginning of an era of new and often nontraditional missions for the U.S. Navy and Marine Corps. One significant issue that had become increasingly alarming during the latter 1990s would dominate - global terrorism. The problem of global terrorism would be added to	13-15

Chapter 12 / Section 1: NS2-M1C12S1 – The Global War on Terrorism

	another major problem that had last been confronted around the turn of the 19th century—piracy. Worldwide, humanitarian missions (for relief of human suffering) would be another important priority.	
Introduction	Explain that against this backdrop and in order to better support and carry out Navy missions, several innovative changes would be made to the ways in which carrier strike groups and Marine expeditionary forces were made up and deployed. Later in the decade, the U.S. Navy would be given a new, additional mission of sea-based ballistic-missile defense (BMD) of our homeland as well as those of our allies in Europe and the Far East.	16
Introduction	Explain that funding for adequate numbers of trained personnel, ships, and aircraft to support the pace of operations in support of the worldwide humanitarian since the beginning of the new millennium has been a persistent problem, especially since the 2007 recession. By 2005, the total number of Navy ships had decreased from approximately 589 during the latter part of the Cold War in 1985 to 283, a number that has not changed much since.	17
Introduction	Explain that at the same time, the demands of the wars in Iraq and Afghanistan created such shortages in numbers of qualified personnel to man these ships that it became necessary to adopt measures including rotating crews to deployed ships from those undergoing maintenance and overhauls, a practice unheard of in times past. This state of affairs has not been made any easier by the mandated federal funding cuts of the recent past, and it will undoubtedly present many challenges in the foreseeable future.	18-19
Early Events	Explain that in October 2000, the guided-missile destroyer U.S.S. Cole (DDG 67), in port in Aden, Yemen, for a routine fuel stop, suffered a large hole blown in her port side by a bomb-laden boat crewed by two Islamic suicide bombers. Seventeen U.S. sailors were killed, and thirty-nine others were injured. The terrorists conducting the attack were subsequently linked to the terrorist Osama bin Laden. The damaged ship was carried back to the Ingalls Shipyard in Pascagoula, Mississippi, on board a civilian transport ship. There the ship was repaired and would be re-launched in September 2001, ironically in the same week as the terrorist attacks on the World Trade Center and the Pentagon.	20-21
Early Events	Explain that in April 2001, the often contentious U.S. relationship with China experienced another low when a Navy P-3 reconnaissance aircraft flying a mission over international waters in the South China Sea suffered a midair collision with a Chinese fighter jet that came too close. Following the collision, the Chinese plane crashed into the sea, killing its pilot. The American plane made an emergency landing on China's Hainan Island, south of the mainland. The twenty-four men and women of its crew were held for the next eleven days until they were released into U.S. custody. They received a hero's welcome when they returned to the United States a few days later. The plane was later dismantled by the Chinese, who returned it in pieces to the United States in early July.	22-23
Early Events	Explain that in June 2002, the United States formally withdrew from the 1972 antiballistic-missile (ABM) defense treaty that had been negotiated with the old Soviet Union, thus freeing the Navy to pursue the development and deployment of an ABM version of its Standard Shipboard Air Defense Missile, the SM-3. This would pave the way for the ballistic-missile defense mission in the later years of the decade. Such a missile and its supporting radar systems would have been prohibited under the 1972 treaty.	24

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Terrorist Attacks of 11 September 2001	Explain as the nation entered the new millennium, ominous signs began to appear that the threat posed by global terrorism would continue to assert itself, as evidenced by the bombing of the U.S.S. Cole in October 2000. Then, on the morning of 11 September, 2001 (henceforth referred to as 9/11), the unthinkable happened. The two World Trade Center towers in New York City were hit and set afire by hijacked airliners. The first tower was hit at 8:46 am, the second tower at 9:03. At 9:37 a.m., a third hijacked plane hit the Pentagon in Washington, D.C. A fourth plane, presumably headed toward targets in Washington, D.C., crashed into the countryside in western Pennsylvania at 10:06 a.m., most likely the result of a scuffle between its Islamic hijackers and the passengers and crew.	25-27
Terrorist Attacks of 11 September 2001	Explain that both Trade Center towers collapsed within hours of the attack, resulting in the death of nearly three thousand people. The attack on the Pentagon killed 189 people. Thirty seven passengers and seven crew members were killed in the Pennsylvania crash.	28
Terrorist Attacks of 11 September 2001	Explain that President George W. Bush immediately called the terrorist attacks an act of war. He vowed to retaliate against the terrorist organizations responsible for the attacks. It was later determined that bin Laden and his al-Qaeda terrorist organization were responsible for the attacks in what was originally called the War on Terror. This action expanded into a Global War on Terrorism or GWOT. The term used by the Obama administration is Overseas Contingency Operation.	29
Terrorist Attacks of 11 September 2001	Explain that on 14 September 2001, the United States and Canada began a homeland defense effort that was designated as Operation Noble Eagle. The Navy immediately deployed ships of the Atlantic and Pacific Fleets off the East and West Coasts to help guard against further terrorist attacks. Air National Guard planes flew combat air patrols over New York City, Washington, D.C., and other large cities throughout the country.	30-31
Terrorist Attacks of 11 September 2001	Explain that within a few weeks, some 50,000 reservists of all services were given mobilization orders to augment Air National Guard units, help guard U.S. airports, and provide other support.	32
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	33
Operation Enduring Freedom	Explain that in the days following the 11 September attack, plans were made to retaliate against bin Laden and al-Qaida and any countries that supported them, beginning with the Taliban government in Afghanistan. When the Taliban would not surrender bin Laden, the United States, at the direction of President George W. Bush, deployed military assets to the region in preparation for a large military confrontation. On 8 October 2001, Operation Enduring Freedom began.	34
Operation Enduring Freedom	Explain that these deployments included the aircraft carriers <i>U.S.S. Theodore Roosevelt (CVN 71)</i> and <i>Carl Vinson (CVN 70)</i> , plus other carriers and support ships in the Arabian Sea, over a hundred Air Force fighter-bombers, and a large contingent of U.S. special operations forces. Many other nations pledged to support the American effort.	35
Operation Enduring Freedom	Explain that in late 2001 and early 2002, peacekeeping forces from N.A.T.O. countries and many other nations arrived in Afghanistan and joined American forces to keep peace and provide training for Afghan military forces and civilian police. While the struggle ensued, humanitarian airdrops of food to relieve the suffering of the Afghan population continued.	36-37

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Operation Enduring Freedom	Explain that the Navy and Air force conducted air strikes on strategic targets. On the ground, the Northern Alliance, which consisted of a loose coalition of northeastern rebel Afghan tribes, continued to fight against the Taliban. The American Special Forces provided ground support.	38-39
Operation Enduring Freedom	Explain that by late November the Northern Alliance, supported by relentless air attacks by U.S. Navy and Air Force planes, and by American Special Forces personnel on the ground, had seized control of most of the country from the Taliban.	40
Operation Enduring Freedom	Explain that several key al-Qaeda leaders had been captured or killed, but bin Laden Himself, escaped. Most of the remaining Taliban and al-Qaeda sought safe haven either in Pakistan or in the remote mountains in Afghanistan.	41
Operation Enduring Freedom	Explain that an international conference in Bonn, Germany, laid the framework for political reconstruction of the country. Though the conference also stipulated that all remaining Afghan militia forces were to be placed under control of the new government, in reality, most militias continued to affiliate with regional and tribal leaders. This became a situation that would be a source of continuing problems for the new regime.	42-43
Operation Enduring Freedom	Explain that in October 2004, Hamid Karzai became the first democratically elected President of Afghanistan, an office he would continue to hold until mid-2014.	44
Operation Enduring Freedom	Explain that in late 2001 and early 2002, peacekeeping forces from N.A.T.O. countries and many other nations arrived in Afghanistan and joined American forces to keep peace and provide training for Afghan military forces and civilian police. Although for a time things were relatively quiet, eventually Taliban insurgent activity began to increase, and, as in Iraq in later years, improvised explosive devices (I.E.D.'s) and suicide bombers began to take an increasing toll.	45
Operation Enduring Freedom	Explain that thousands of regular and reserve Navy personnel served in nontraditional roles in Afghanistan during these years. Surface line officers served as artillery battery commanders; Navy divers assisted with explosive ordinance disposal; and Seabees and other sailors engaged in all manner of support activities throughout the country. A large number of civilian security contractors were also employed to assist in the peacekeeping and training roles.	46
Operation Enduring Freedom	Explain that in spite of the best efforts of the U.S. and allied peacekeeping force, insurgent activity continued to rise. In 2010, President Barack Obama ordered a surge in the number of American troops deployed to Afghanistan and added a new emphasis on shifting most combat and security patrol responsibilities to the Afghan National Army.	47
Operation Enduring Freedom	Explain that at the same time a campaign began against al-Qaeda leaders in refuge in Pakistan, and later in other countries. This campaign often used unmanned aerial vehicles (drones) armed with air-to-ground missiles to attack and kill the al-Qaida leaders.	48
Operation Enduring Freedom	Explain that in 2011 and 2012 the United States and its allies began to draw down the number of troops serving in Afghanistan. Most, if not all, remaining NATO and American military personnel are presently scheduled to be withdrawn from Afghanistan by late 2014.	49
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6 with follow-up discussion as appropriate.	50

Chapter 12 / Section 1: NS2-M1C12S1 – The Global War on Terrorism

Operation Iraqi Freedom	By 2002, continuing defiance by Iraq's Saddam Hussein of the terms of the 1991 cease-fire agreement ending Operation Desert Storm had become a major issue for the United States. Hussein had prevented U.N. weapons inspection teams from inspecting key sites on several occasions, and there were alarming intelligence estimates (later disputed) that Iraq was accumulating a growing stockpile of weapons of mass destruction—chemical, biological, and, of special concern, nuclear weapons. There were also claims that Hussein was harboring al-Qaeda terrorists, though these claims were never substantiated.	51-52
Operation Iraqi Freedom	Explain that in late 2002, President Bush declared that if the UN did not take more decisive action to force Hussein to disarm, the United States might have to take unilateral military action against Iraq. When the U.N. Security Council and several other countries pressed for more time to seek a diplomatic solution, the United States decided to move toward war unless Hussein and his sons agreed to leave Iraq.	53
Operation Iraqi Freedom	Explain that on 17 March 2003, President Bush gave him forty-eight hours to leave the country. Hussein did not leave and on 19 March the United States, along with coalition partners Britain and several other nations, began Operation Iraqi Freedom. The Operation ensued with extensive air and missile attacks against the capital, Baghdad, and other key military targets.	54-55
Operation Iraqi Freedom	Explain that the initial attacks began on 20 March 2003, using what were dubbed by Defense Secretary Rumsfeld as “shock and awe” tactics. These attacks were intended to destroy most of Iraq's command and control organization and kill as many Iraqi leaders as possible, including, ideally, Hussein himself. In the days that followed, a large number of American-led coalition troops invaded Iraq from the south in a blitzkrieg-like advance toward Baghdad, while other airborne forces parachuted into Northern Iraq, where they joined together with Iraqi Kurds. By 9 April, these forces had succeeded in capturing Baghdad. On 1 May, on board the carrier <i>U.S.S. Abraham Lincoln (CVN 72)</i> , President Bush declared that major combat had ended.	56-59
Operation Iraqi Freedom	Explain that Hussein and his sons managed to elude capture for a time, but both sons were killed by coalition forces on 22 July 2003. Hussein was captured near Tikrit, north of Baghdad, on 13 December 2003. He would eventually be convicted of crimes against humanity by an Iraqi court and was executed on 30 December 2006.	60-61
Operation Iraqi Freedom	Explain that massive efforts were begun to rebuild Iraq's infrastructure (basic communications, transportation, and other vital facilities and services), and the coalition began to train Iraqi military and civilian police forces to eventually take over responsibility for keeping order in the country. As in Afghanistan, many of these efforts were assisted by Navy personnel serving in nontraditional roles. These efforts would go on for the remainder of the U.S. presence in Iraq.	62-63
Operation Iraqi Freedom	Explain that the Coalition Provisional Authority transferred sovereignty to the Iraq Interim Government in June 2004, and its first president, Ghazi al-Ujayl al-Yawr, was elected in January 2005.	64
Operation Iraqi Freedom	Explain that unfortunately, the capture of Baghdad and Hussein did not end all hostilities in Iraq. Roadside I.E.D.'s, suicide bombs and other attacks by insurgent forces and terrorists sympathetic to Hussein's old regime and to al-Qaeda continued throughout the decade and into the next, until and beyond the U.S. withdrawal. This led to the deaths of thousands of American military personnel and other coalition troops, as well as Iraqi civilians.	65
Operation Iraqi Freedom	Explain that As the war progressed from the early days of Operation Iraqi Freedom to what would become an eight-year-long U.S. presence, American public opinion increasingly grew in favor of withdrawal. This trend was exacerbated by an increasing	66

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	body of evidence that indicated that, despite many intelligence estimates to the contrary, there had been no weapons of mass destruction in Iraq at the time of the invasion in 2003.	
Operation Iraqi Freedom	Explain that on 1 September 2010, President Obama officially proclaimed the end of U.S. combat operations in Iraq, thus ending Operation Iraqi Freedom. On 15 December 2011, Defense Secretary Leon Panetta, at a flag lowering ceremony in Baghdad, officially declared an end to the war in Iraq . The last U.S. troops left Iraqi territory on 18 December 2011.	67-68
Operation Unified Assistance	Explain that in late December 2004, in the midst of the wars in Iraq and Afghanistan, a huge tsunami generated by a strong undersea earthquake in the Indian Ocean basin devastated much of the seacoasts of Indonesia, Sri Lanka, Thailand, southern India, and several other countries in South and Southeast Asia. By some estimates as many as 370,000 people were either killed by the tsunami itself or by its effects shortly thereafter.	69
Operation Unified Assistance	Explain that in response the United States initiated Operation Unified Assistance, deploying eight U.S. Navy ships, including the carrier <i>USS Abraham Lincoln</i> and the amphibious assault ship <i>USS Bonhomme Richard (LHD 6)</i> , along with P-3 aircraft from Kadena, Japan, and heavy-lift cargo aircraft from the U.S. Air Force, to assist in the recovery effort.	70
Operation Unified Assistance	Explain that in the next two months, humanitarian assistance had logged over two thousand missions in support of the relief efforts by the amphibious ships <i>U.S.S. Fort McHenry</i> and <i>Essex</i> , and some 12 million tons of supplies had been flown to the region by Navy and Air Force planes. Several thousand casualties had been treated by U.S. medical personnel, mainly on board the hospital ship <i>USNS Mercy (T-AH 10)</i> , sent to the region as part of the humanitarian response.	71-72
Review Question	The Review Question is, “Name five key components of a country’s infrastructure.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	73
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	74
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	75

Chapter 12 / Section 1: NS2-M1C12S1 – The Global War on Terrorism

III. Supplemental Activities -

A. In class Activity:

Supplies required: none

When: The in-class activity can take place as an introductory activity

- In-Class: Cadets should discuss this topic: Why does the U.S. take on some many humanitarian aid missions outside of the United States? Do you agree that this should be a priority? Why or why not? Have a brief debate hearing from cadets that do think that the US should be doing humanitarian missions outside of the US and from those who do not.

B. Take Home Activity: Using the Handout “9-11 Interview”, have the cadets interview at least one adult that remembers the details of 9-11 very well.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 12 / Section 1: NS2-M1C12S1 – The Global War on Terrorism

Activity1: Take Home Activity: 9-11 Interview

Name: _____ Date: _____ Class: _____

Directions: You are to interview someone who remembers 9/11. Ask the following questions and add a few of your own.

1. Where were you when the attacks happened? What were you doing? How did you learn of the attacks?

2. How did you react physically and emotionally when you heard of the attacks?

3. Why do you think that the terrorists decided to attack the World Trade Center?

4. Did you know anyone who lost their life that day? If so, what were your feelings knowing they lost their life that way?

5. Do you think this type of attack will happen again on U.S. soil?

6. How did 9-11 affect your sense of patriotism and your overall view of the United States?

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7. Did you support how President Bush handled the situation? Why or why not?

8. How do you feel today about being an American?

9. What lasting impacts do you think 9/11 have had on you? Our country? The world?

Add Your Own Questions:

Chapter 12 / Section 2: NS2-M1C12S2 – Piracy

(Section 2 of 3)

What Students Will Learn to Do:

Demonstrate an understanding of Naval history in the 21st century

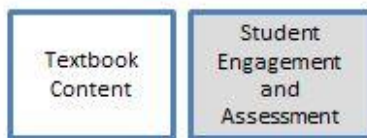
Skills and Knowledge to be Gained:

1. Explain the Maersk Alabama piracy incident in 2010
2. Explain other significant international events in 2010
3. Describe humanitarian missions in Haiti and Japan in 2010 and 2011
4. Describe the mission to capture Osama bin Laden in 2011
5. Explain the Arab Spring revolts in 2011

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 12. Place a checkmark beside the NS2-M1C12S2 PowerPoint presentation, and these two CPS question deck files: NS2-M1C12S2 - Key Terms and NS2-M1C12S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 12 / Section 2: NS2-M1C12S2 – Piracy

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will learn about the rebirth of the piracy threat on the high seas. We will also look at the relief efforts in Asian countries. Finally, we will talk about the death of bin Laden and how the Arab Nations are changing due to the Arab Spring revolts.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-9
Opening Question(Random Pick a Student – “RPS”)	<p>This Opening Question is, “What tactics do you think could be used to control piracy in the waters around Somalia?” Since this is a discussion question, it can be engaged using the RPS function where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on piracy</p>	10
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	11
Piracy	Explain that in the last quarter of the 18 th century, state-supported piracy along the North African coast plagued the United States. Although sporadic outbreaks of piracy have occurred for many centuries around the globe, not since the war with Tripoli in 1803 did these incidents of piracy represent a significant threat to freedom of navigation on the high seas.	12
Piracy	Explain that in the late 1990’s, there began to be increasing international concern over fishing vessels, other ships, and seamen being captured and held for ransom by pirates in the waters of the Gulf of Aden off Somalia. At first, these attacks had been in carried out in retaliation for international fishing violations in Somali territorial waters following the start of the civil war there in 1991. By the mid-1990s, they had become a source of income for destitute Somali fishermen. By the start of the new millennium, these attacks had escalated to attacks on merchant vessels and yachts of all sizes and descriptions.	13
Piracy	Explain that the range of pirate activities is extended by operating from the mother ship well beyond Somalia territorial water. These attacks represented a significant threat to ships of all maritime nations.	14
Piracy	Explain that in response to this threat, the U.S. Central Command ordered Task Force 150, consisting of several destroyers that had been assigned to the area as part of	15-16

Chapter 12 / Section 2: NS2-M1C12S2 – Piracy

	Operation Enduring Freedom, to conduct antipiracy patrols. In 2002, TF 150 became a combined task force, including ships from four other nations. By the middle of the decade, this force had grown to a multinational force of some fifteen ships on rotational assignments from as many as twenty-five nations, with the command of the force rotating among the participating nations.	
Piracy	Explain that however, restrictions regarding the use of force and the disposition of any pirates captured rendered the task force incapable of preventing a steady increase in the number of hijackings. By 2008, at the height of Somali piracy, the pirates held more than thirty ships and over six hundred hostages. Further, more than \$100 million in ransoms had been paid. Thereafter, both the number of attacks and successful hijackings began to decline, both because of more aggressive UN mandates governing the antipiracy force and also better countermeasures, including armed security guards on the merchant ships themselves.	17-19
Piracy	Explain that today, in addition to the multinational task force, NATO, the European Union (E.U.), and individual ships from various countries operating independently all conduct antipiracy operations off the Horn of Africa. International antipiracy forces routinely conduct raids ashore in Somalia to confiscate pirate weapons, equipment, and fuel. Patrol aircraft fly over the shoreline to relay pirate activity to nearby warships. As of the end of 2012, the pirates held only seven ships and 177 crew members. Nevertheless, piracy continues to be a threat to all vessels transiting the region and will probably continue to remain so for some time to come.	20-21
Piracy	Explain that one of the more storied incidents of piracy in this region that garnered major headlines and sparked a 2013 movie, occurred in April 2009, when four heavily armed Somali pirates boarded the American containership <i>Maersk Alabama</i> 240 miles off the Somali east coast, in the Indian Ocean. It marked the first time a U.S.-flagged ship had been seized by pirates since the early 1800s. The ship, with a crew of twenty, including her master, Richard Phillips, was bound for the port of Mombasa, Kenya, with approximately 17,000 tons of cargo, including relief supplies for Somalia, Uganda, and Kenya.	22-23
Piracy	Explain that when the pirates boarded, most of the crew barricaded themselves in the engine room where they could maintain control of the ship. Meanwhile, Captain Phillips and two other crewmen remained on the bridge. When the pirates could not gain control, they grew frustrated and decided to leave the ship in one of its covered orange motorized lifeboats. Captain Phillips was taken along as a hostage.	24
Piracy	Explain that the next day the U.S. destroyer <i>Bainbridge</i> (DDG 96) arrived on the scene, having been dispatched from the combined piracy task force upon receipt of word of the hostage situation. The frigate <i>Halyburton</i> (FFG 40) and the amphibious assault ship <i>Boxer</i> (LHD 4) arrived on scene the following day. The <i>Maersk Alabama</i> , under the command of her chief engineer, resumed course toward Mombasa. Meanwhile, a standoff situation developed with the pirates on the lifeboat which had begun to slowly proceed toward Somalia.	25
Piracy	Explain that another two days went by, during which Captain Phillips made an unsuccessful escape attempt. Also, the pirates at one point opened fire on a small boat from the <i>Halyburton</i> .	26
Piracy	Explain that by now the lifeboat was nearly out of fuel, and the <i>Bainbridge</i> 's captain convinced the pirates to let the ship take it in tow toward Somalia. One of the pirates boarded the <i>Bainbridge</i> to negotiate and receive treatment for a wound received while on board the <i>Maersk Alabama</i> . Unbeknownst to the pirates, a contingent of Navy SEALs had boarded the <i>Bainbridge</i> during the night and taken concealed firing	27

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	positions on the fantail. When the remaining pirates came out into the open to escape the heat in the enclosed lifeboat, the SEALs opened fire, killing all three and rescuing Captain Phillips.	
Piracy	Explain that interestingly, this incident would not be the last encounter of the <i>Maersk Alabama</i> with Somali pirates. They attempted to board her four more times over the next two years during subsequent transits through the area, each time being repulsed by security teams by then embarked.	28
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	29
Relief Efforts in Haiti	Explain that the value of the Navy's humanitarian mission was exemplified by the Navy's response to a major earthquake in Haiti that occurred on 12 January 2010 killing an estimated 220,000 people in and around the capital city of Port-au-Prince. Approximately one million more people were injured or rendered homeless.	30
Relief Efforts in Haiti	Explain that within a week the carrier <i>Carl Vinson</i> had arrived on scene with an enhanced air wing of nineteen helicopters; soon the carrier had distributed over 600,000 emergency rations and 100,000 bottles of drinking water. The carrier was the first of an eventual seventeen Navy ships that came to render assistance in the first days of the recovery efforts, including the hospital ship <i>USNS Comfort (T-AH 28)</i> . Altogether over ten thousand Marines and Sailors helped to clear the harbor and make it functional once more, as well as assisting in many other ways.	31-32
Tsunami in Japan	Explain that on 11 March 2011, there occurred a magnitude-9 earthquake off the coast of Japan, the largest ever to have hit Japan and the fifth largest earthquake in recorded history. The earthquake triggered a powerful tsunami that impacted the western coastline of Japan's northern islands with forty-foot waves, killing thousands of people and wiping out entire coastal towns and villages. Perhaps the worst effect was severe damage to four nuclear reactors at a coastal nuclear power plant at Fukushima, located on the northeastern coast of the large island of Honshu. Primary and backup power for cooling water was lost, and three of the reactors melted down. This was accompanied by a major release of radiation. This contamination soon found its way into ground and sea water, forcing evacuations for miles around.	33-35
Tsunami in Japan	Explain that within hours the U.S. Seventh Fleet was deploying ships to the area in a massive humanitarian assistance and disaster relief (HA/DR) operation. More than 3,600 Sailors and Marines served in the lead elements of the relief forces, delivering tons of food and water and helping with the evacuation of approximately eight thousand American citizens there. Ultimately, some twenty-four ships and 15,000 Sailors and Marines took part, doing everything from harbor clearance to providing technical support and barges of cooling water for the stricken nuclear power plant at Fukushima.	36-38
The Death of bin Laden	Explain that the capture or killing of Osama bin Laden, the terrorist who had masterminded the 9/11 al-Qaeda terrorist attacks on New York and the Pentagon in 2001, had been a high priority for the United States since the attacks took place. Bin Laden had successfully eluded capture for almost a decade. Numerous leads had been fruitless. It was known that bin Laden had avoided the use of cell phones ever since the United States had launched missile strikes against his bases in Afghanistan and Sudan in 1998. Thus, a key tactic in the intelligence community after 2002 was to track the movements of his couriers, who personally conveyed directions to his subordinates in the al-Qaeda organization.	39

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The Death of bin Laden	Explain that finally, in late 2010, information led the United States Intelligence to a walled compound in Abbottabad, Pakistan. The U.S. intelligence community placed the compound under intensive surveillance. Eventually, officials concluded that bin Laden was in fact living within the compound with his youngest wife and family. Soon thereafter, options were developed by the CIA and the Joint Special Operations Command (JSOC) to attack the compound and kill or capture bin Laden.	40-41
The Death of bin Laden	Explain that there were two promising options of how to conduct the attack. The options consisted of either an attack by Air Force stealth B-2 bombers with precision-guided bombs or a ground assault by commandos. Should the latter course of action be chosen, the commandos selected would be a Navy SEAL team. President Obama met with his National Security Council (NSC) on 14 March 2011, to review the options. There was some concern about collateral damage if ground assault by commandos was adopted. At the next NSC meeting a week later, the decision was made to conduct the raid by a SEAL team. It was given the secret operational code name <i>Neptune Spear</i> . For the next month intensive rehearsals were conducted with great secrecy in the United States and at Bagram Air Base in Afghanistan, where a full-scale replica of bin Laden's compound was built in an isolated part of the base.	42-44
The Death of bin Laden	Explain that by the end of April all was in readiness, and the director of the C.I.A., Leon Panetta, under orders from the President, directed VADM William McRaven, director of J.S.O.C., to proceed with the raid on 1 May. At 1500 that day, the President joined selected officials in the White House Situation Room to monitor the operation.	45
The Death of bin Laden	Explain that shortly after 2300 on the dark, moonless night of 1 May 2011, two Army Stealth helicopters took off from the Jalalabad air base in eastern Afghanistan with twenty SEALs from SEAL Team 6 and one military working dog. The dog was included to give warning of approaching Pakistanis or escapees from the compound. The aircraft entered undetected into Pakistani airspace and preceded to the target in Abbottabad. Approximately ninety minutes later, they were hovering over the compound. The original plan called for one group of SEALs from one helicopter to fast-rope onto the compound's roof. Meanwhile, the second helicopter which carried the dog, landed inside the walls to secure the perimeter. This plan had to be abandoned, however, when a downdraft caused one helicopter to hit a wall. The helicopter crash-landed into the compound. Fortunately, none of the SEALs were injured and they proceeded to attack the compound's guest house. Meanwhile, the second helicopter carrying a SEAL team landed in the helicopter outside the walls. The SEALs quickly scaled the walls and joined their fellow SEALs.	46-47
The Death of bin Laden	Explain that after neutralizing the residents of the guest house, the SEALs gained entrance to the three-story main house with explosives and crept up the stairs toward the bedroom on the third floor, where it was presumed that bin Laden was. The house was pitch dark, because CIA operatives had cut the power to the compound. On the way up the SEALs encountered one of bin Laden's sons, whom they shot and killed when he tried to rush them. Bin Laden suddenly peered at them from the third floor and then retreated into his bedroom; one of the SEALs shot him, hitting him in the head. The SEALs quickly followed and discovered him lying on the floor. When he reached for two nearby weapons, he was shot again and killed. The SEAL team leader radioed, "Geronimo Echo KIA," a previously arranged code indicating that bin Laden was dead. When this news reached the Situation Room, President Obama proclaimed, "We got him!" The actual raid took 38 minutes.	48-50
The Death of bin Laden	Explain after shooting bin Laden, the SEALs photographed his body and took DNA samples from the body. They continued on a search of the house and moved survivors into the courtyard, where they were later taken into custody by Pakistanis. They removed computer hard drives, DVDs, and other electronic equipment for later	51-52

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	analysis. The SEALs bagged and carried bin Laden’s body to another reserve Army helicopter that had joined the operation. Before leaving the compound, the SEALs set demolition charges and blew up their damaged helicopter. (Unfortunately, the rotor assembly was later recovered intact by the Pakistanis, a loss that compromised the stealth technology contained within the equipment.)	
The Death of bin Laden	Explain that the SEALs returned in the helicopters to Bagram, where bin Laden’s body was transferred to a Marine Osprey aircraft for transport to the <i>Carl Vinson</i> in the North Arabian Sea. He was buried at sea within twenty-four hours, as required by Muslim custom. The Chairman of the Joint Chiefs of Staff, ADM Michael Mullin, called Pakistan’s army chief at about 0300 local time to inform him and the Pakistani government of the completed raid. They had not been informed previously because of security concerns. The Pakistani government later destroyed the compound, fearing that it would otherwise be turned into a shrine and serve as a lingering reminder of a massive Pakistani intelligence failure.	53-54
Check on Learning Questions B (Lesson questions 5-6)	Check in on students’ understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	55
The Arab Spring Revolts	Explain that throughout the first decade of the new millennium, there was a rising tide of dissatisfaction among the populations in all of the Arabian countries in North Africa and the Middle East. There had long been substandard living conditions in these countries, high unemployment rates in some, and in most, a repression of women, lack of personal liberty, and autocratic rule. As the Internet became more accessible, especially among the younger generations in these countries, the wide gulf between their standards of living and societal norms, versus those of the United States and many other countries worldwide, had become increasingly apparent. This served to only add to the existing discontent.	56-57
The Arab Spring Revolts	Explain that this unrest finally culminated in open protests that began in Tunisia in December 2010 after the public self-immolation of a protester upset over corruption in the government and numerous human-rights violations. The protests quickly spread to neighboring Egypt and eventually to most of the other Arab nations throughout the North African and Middle Eastern regions. They were collectively dubbed the Arab Spring movement by an American journalist, because they were reminiscent of similar “Spring of Nations” protests staged across Europe in 1848 and those of the “Prague Spring” of 1968 in Prague, Czechoslovakia.	58-59
The Arab Spring Revolts	Explain that in many of these countries there were attempts to mollify protestors with promises of increased revenue sharing from the sale of oil exports, with some of these overtures at least partially successful. In countries such as Tunisia and Egypt where there is not much oil production, this was not an option. Violent protests ultimately erupted into open rebellion, resulting in the overthrow of the government of Tunisia in January 2011, and the overthrow of the government of Egypt a month later. Both regimes were replaced by much more liberal, democratic regimes.	60
The Arab Spring Revolts	Explain that both changes in government occurred without significant bloodshed. Such was not the case in Libya, ruled by the always outspoken and oftentimes erratic dictator Muammar Qaddafi. Violent demonstrations erupted there in February 2011 and soon the opposition controlled most of Benghazi, the second-largest city. Before long, they took control of the outskirts of Tripoli, the capital. However, government forces were able to retake much of the coastal territory between the two cities after much bloody fighting and many civilian casualties. This prompted an international effort to protect the civilian population from further bloodshed.	61-63

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The Arab Spring Revolts	Explain that on 17 March 2011, the United Nations Security Council adopted a resolution imposing a no-fly zone over Libya and authorizing “all necessary measures” to protect civilians. Two days later, France, the United States, and the United Kingdom intervened with a bombing campaign against pro-Qaddafi forces. They were soon joined by a coalition of approximately twenty seven other nations from Europe and the Middle East. U.S. Naval Forces played a major role in this effort, called <i>Operation Odyssey Dawn</i> . Participating Navy ships included two attack submarines and one of four recently converted guided-missile/special-operations submarines, the <i>U.S.S. Florida (SSGN 728)</i> , as well as several Aegis destroyers, the <i>U.S.S. Kearsarge (LHD 3)</i> amphibious ready group, and the amphibious command ship <i>U.S.S. Mount Whitney (LCC 20)</i> .	64-66
The Arab Spring Revolts	Explain that altogether the Aegis ships and submarines launched more than 220 Tomahawk cruise missiles at Libyan targets, while Harrier “jump jets” (capable of vertical takeoff and landing) from the <i>Kearsarge</i> , along with Royal Navy and French aircraft, decimated Libya’s air-defense system and destroyed Libyan armor.	67
The Arab Spring Revolts	Explain that by late August, with the help of the coalition air and material support, the anti-Qaddafi fighters had captured Tripoli, ending Qaddafi’s forty-two years of autocratic rule. Qaddafi reconstituted his government for a short time at Sirte, declaring that city to be Libya’s new capital, but in October rebel fighters captured Sirte and killed Qaddafi in the street. The liberation of Libya was complete. In August 2012, the transitional rebel government turned over power to a newly elected General National Congress, which was tasked with forming an interim government and drafting a new constitution.	68-69
The Arab Spring Revolts	Explain that concurrently with the fall of the Qaddafi government in Libya, the Arab Spring movement resulted in either new democratic governments or significant liberalizing reforms in the existing governments of most of the other Arab countries in the region. The bloody uprising became a civil war, with Russia and Iran providing support to Assad. Various factions formed, including the Free Syrian Army. Seven rebel groups merged in November 2013 to form the Islamic Front.	70-71
The Arab Spring Revolts	Explain that in Iran, the effects of the Arab Spring were not as dramatic. There were several large pro-democracy demonstrations held beginning in early 2011, but these were soon brutally suppressed by the hardline Islamist government. Of greater concern to the United States, Israel, and Western European democracies was the issue of Iran’s uranium-enrichment program. This program had been ongoing since the 1950s, but steadily accelerated into the new millennium, causing increasing concern that it would ultimately lead to the production of nuclear weapons. Despite steadfast Iranian denials of this intention, beginning in 2006, the U.N. Security Council began to impose increasingly severe economic sanctions on Iran for not continuing its enrichment program.	72-73
The Arab Spring Revolts	Explain that Iran’s response was to threaten to restrict or close the adjacent Strait of Hormuz to oil tanker traffic. This would be especially troublesome for European Union (E.U.) nations who import much of their oil through the strait. Both the United States and the E.U. threatened appropriate military action to keep the strait open if Iran should attempt to close it	74
The Arab Spring Revolts	Explain that more recently, some progress has been made with diplomatic efforts to get Iran to curtail its enriched uranium production, both the United States and Israel have threatened to take unilateral military action against Iran if it continues to enrich uranium to the degree necessary to build nuclear weapons. It remains to be seen what the long-term outcomes in the Syrian and Iranian situations will be and how the liberal reforms spawned by the Arab Spring movement in other Arab nations in the region will	75

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	fare in the future. It remains to be seen what the long-term outcomes in the Syrian and Iranian situations will be and how the liberal reforms spawned by the Arab Spring movement in other Arab nations in the region will fare in the future.	
Review Question	The Review Question is, "Discuss some effects that access to the Internet has had on Arab nations and surrounding countries." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	76
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	77
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	78

III. Supplemental Activities -

A. In class Activity:

Supplies required:

When: The in-class activity can begin prior to the lesson and cadets can go back to the activity throughout the lesson on piracy and Somalian pirates.

- In-Class: Cadets will participate in an introductory activity prior to the lesson. Instructor writes the word PIRATE on the board and cadets will give words that describe traditional pirates. Any video clip from Pirates of the Caribbean, such as this one, could be used to generate interest.
- Next, ask cadets to use the Venn diagram PIRATES and put characteristics of traditional pirates into that circle of the Venn diagram.
- After the take-home activity, ask cadets to return to the Venn diagram and fill in the modern day pirates circle with things that they learned in the lesson and from the article.
- As a class, discussion what characteristics the two different pirates share.

B. Take Home Activity: Have the cadets read the New York Times article on modern day pirates found at the following link:

http://www.nytimes.com/2008/10/01/world/africa/01pirates.html?_r=2&

Using the handout, "Modern Day Pirates" have them respond to the following quote:

"We don't consider ourselves sea bandits. We consider sea bandits those who illegally fish in our seas and dump waste in our seas and carry weapons in our seas. We are simply patrolling our seas. Think of us like a coast guard."—Pirate interviewed by New York Times

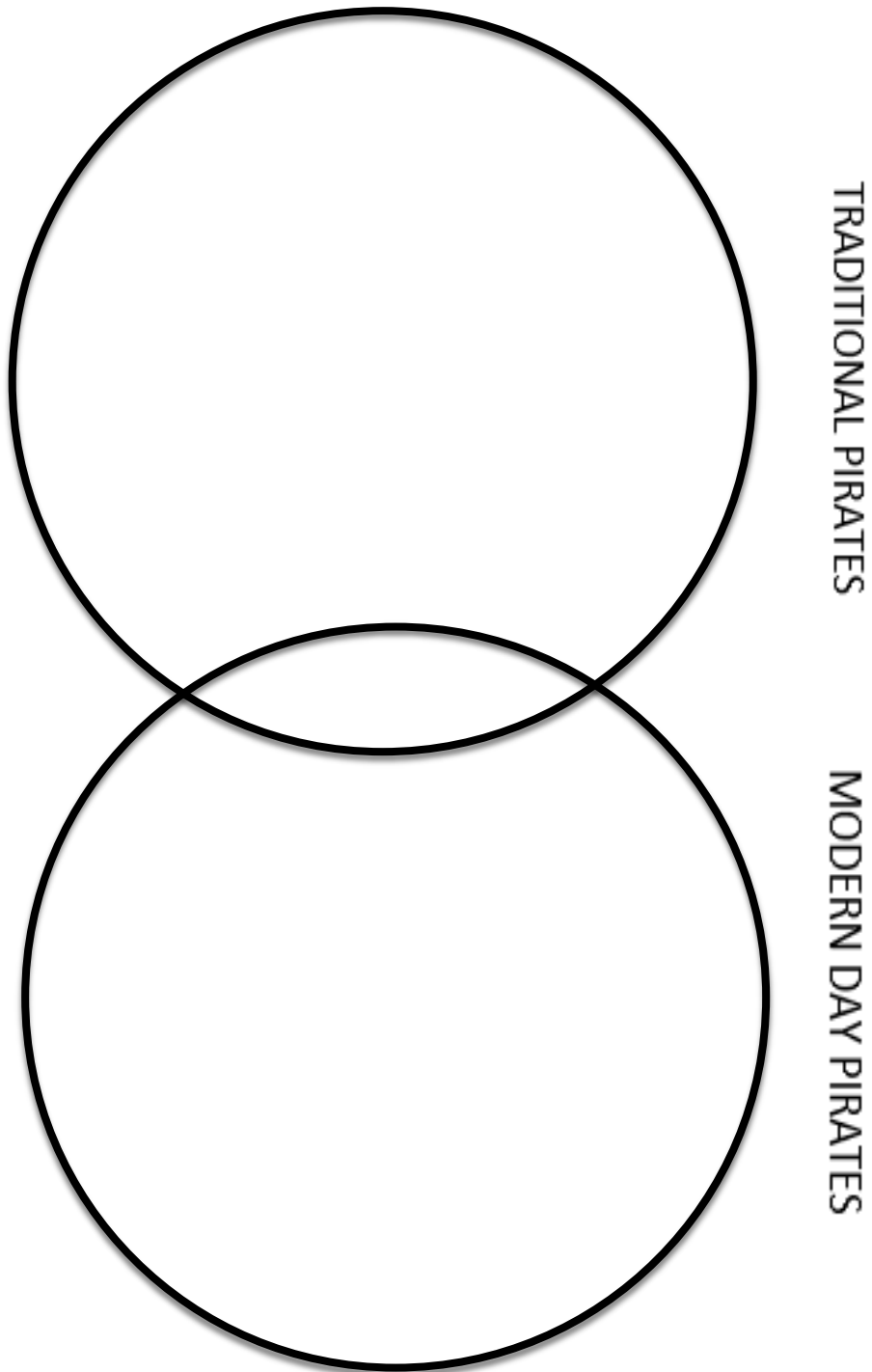
Have the cadets write a paragraph explaining why there are modern day pirates.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 12 / Section 2: NS2-M1C12S2 – Piracy

Activity 1: In Class Activity: Venn diagram - PIRATES

Name _____ Date _____ Class _____



Chapter 12 / Section 2: NS2-M1C12S2 – Piracy

Activity 1: Take Home Activity- Modern Day Pirates.

Name: _____ Date: _____ Class: _____

Read the New York Times article on modern day pirates found at the following link:
http://www.nytimes.com/2008/10/01/world/africa/01pirates.html?_r=2&

Read the following quote and write down your opinion of what you think about it.

"We don't consider ourselves sea bandits. We consider sea bandits those who illegally fish in our seas and dump waste in our seas and carry weapons in our seas. We are simply patrolling our seas. Think of us like a coast guard."—Pirate interviewed by New York Times

Write a paragraph explaining why there are modern day pirates.

Chapter 12 / Section 3: NS2-M1C12S3 – Ballistic Missile Defense

(Section 3 of 3)

What Students Will Learn to Do:

Demonstrate an understanding of Naval history in the 21st century

Skills and Knowledge to be Gained:

1. Discuss the issues around the antiballistic missile (A.B.M.).
2. Discuss the relationship and issues between the United States and North Korea in the new millennium.
3. Discuss terrorism and violent extremist which has become prevalent in our world.
4. Discuss the concept of cyber warfare, and why it is important.
5. Discuss some of the equipment military equipment issues and their impact and significant deployments.
6. Explain how personnel issues have impacted the U.S. military in recent years.
7. Discuss how current issues will shape the military in the coming years.

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Warm Up Questions	Ballistic Missile Defense	Trouble With North Korea	Check On Learning A
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Terrorism and Violent Extremism	Cyber Warfare	Check on Learning B	Equipment Issues	Personnel Issues	A Look Back– and Ahead	Review Questions	Closing Questions
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Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 12 / Section 3: NS2-M1C12S3 – Ballistic Missile Defense

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 1, Chapter 12. Place a checkmark beside the NS2-M1C12S3 PowerPoint presentation, and these two CPS question deck files: NS2-M1C12S3 - Key Terms and NS2-M1C12S3 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons. In this lesson we will learn about the troubled relationship between the United States and North Korea. We will also take a look at the continued threat of terrorism and violence both worldwide and on our own soil. We will discuss Cyber warfare and finally, we will look at what lies ahead for the Navy.	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-8
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “In what ways has North Korea attempted to establish military dominance?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on ballistic missile defense.	9
Warm-Up Questions(Lesson questions 1-2)	Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions. Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.	10
Ballistic Missile Defense	Explain that the 2002 U.S. withdrawal from the Soviet-era Antiballistic Missile Defense Treaty cleared the way for the development of the antiballistic missile (A.B.M.) version of the ship-launched Standard missile, the SM-3, capable of intercepting and destroying incoming ballistic missiles.	11
Ballistic Missile Defense	Explain that in the years since, steady improvements have continued to be made both to the missile and its supporting <i>Aegis</i> ballistic missile defense (B.M.D.) radar systems.	12-13

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	The capabilities of the system were dramatically demonstrated in 2008, when a SM-3 missile fired from an Aegis cruiser brought down an errant U.S. satellite 130 miles above the North Pacific Ocean. Currently there are some thirty <i>Aegis</i> B.M.D.-capable cruisers and destroyers in service, roughly split between the Atlantic and Pacific fleets. More retrofits of older <i>Aegis</i> ships and acquisitions of additional new <i>Aegis</i> B.M.D. ships are planned for the future as quickly as funding allows.	
Trouble with North Korea	Explain that throughout the last half of the 1900s, North Korea sought to assert its control with a stronger army. At the start of the new millennium, they were the fourth largest army in the world, behind that of China, the United States, and India.	14
Trouble with North Korea	Explain that upon the death of Kim Sung-il in 1994m Kim Jong-il assumed dictatorship of North Korea. Like his father before him, he had paid little attention to the welfare or human rights of his citizenry, prompting President Bush in 2002 to refer to North Korea as an “outpost of tyranny.” North Korea became more aggressive in the area of nuclear armament. They announced a step-up in uranium-enrichment and underground nuclear bomb testing. They conducted two such underground tests in 2006 and 2009.	15-16
Trouble with North Korea	Explain that in March 2010, North Korea torpedoed and sank a South Korean patrol boat. For months, North Korea steadfastly denied all allegations that it had done so, and responded to the allegations by severing most accords between the two countries. In November, it shelled a nearby South Korean island. North Korea continued to develop its uranium-enrichment program and conduct provocative missile tests, culminating in the launch of a space satellite in December 2012. Things went from bad to worse in 2013. In February, it conducted a third underground nuclear test.	17-19
Trouble with North Korea	Explain that in March, the North Korean government announced intentions to launch preemptive (surprise) nuclear strikes against South Korea. The United States followed a few days later by announcing that it was withdrawing from all nonaggression pacts with South Korea, and that it had abrogated the long-standing 1953 Korean War Armistice agreement. On 30 March, it declared itself to be in a state of war with South Korea. In response to these actions, two U.S. Air Force nuclear-capable B-2 stealth bombers were flown, with wide publicity, across the Korean Peninsula to demonstrate American resolve to maintain its nuclear shield over South Korea.	20-21
Trouble with North Korea	Explain that several B.M.D.-capable <i>Aegis</i> destroyers and a cruiser were stationed in the Sea of Japan to detect, track, and intercept any threatening missiles that might be launched by North Korea. North Korea subsequently retracted its provocative behavior toward South Korea and the United States, most likely in response to urgings from China, its ally, after diplomatic pressure from the Obama administration.	22
Trouble with North Korea	Explain however, that North Korea has continued its vigorous uranium enrichment, underground nuclear testing, and missile-test programs, despite numerous international sanctions and diplomatic protests from the United States, South Korea, Japan, the United Nations, and even China. Many international organizations, including the UN, accuse Kim Jong-un and North Korea of having one of the worst human rights records of any nation in the world, including murder, enslavement, torture, and prolonged starvation of its citizenry.	23-24
Trouble with North Korea	Explain that future military plans in response to the provocative behavior of North Korea call for the United States to assist South Korea in building six more <i>Aegis</i> destroyers to add to the three it already has, and for Japan to upgrade several of its destroyers with the <i>Aegis</i> B.M.D. system. Additional land-based A.B.M.’s will also be added to those already in place on the U.S. West Coast, in California and Alaska by 2017. Most military intelligence analysts have asserted that North Korea does not as yet have the capability to deliver a nuclear warhead on any of its current missiles. To date,	25-26

Chapter 12 / Section 3: NS2-M1C12S3 – Ballistic Missile Defense

	it does not have the wherewithal to launch an invasion into South Korea without assistance from China, which it is very doubtful to receive. It remains to be seen what the eventual outcome of this latest round of volatile behavior by North Korea will be.	
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	27
Terrorism and Violent Extremism	Explain that unfortunately, the threat of worldwide terrorism and violent extremism continued unabated into the new millennium. During the years since 2000, there have been several significant instances of both acts of violence on U.S. soil and abroad.	28
Terrorism and Violent Extremism	Explain that the highest number of terrorist attacks in the world over the last decade outside war zones is said to have taken place in India. Most of these attacks have occurred in Mumbai (formerly Bombay), the most populous city in that country. After a series of bombings over several years involving public transportation facilities, the worst of these attacks occurred in November, 2008 when a radical group staged a three-day bombing campaign in the center of the city. These attacks killed 166 people and injured more than three hundred others. All terrorists involved were hunted down and either killed or captured by local authorities. Similar attacks on a smaller scale have resulted in hundreds of casualties in dozens of countries across the globe.	29-30
Terrorism and Violent Extremism	Explain that in the United States, there occurred two particularly violent attacks. On 5 November 2009, at Fort Hood, Texas, an Army base engaged in readying Army troops for deployment in Iraq and Afghanistan, an Army psychiatrist, MAJ Nidal Hasan, opened fire on enlisted personnel, killing thirteen and injuring thirty. Although officially classified as an act of workplace violence, the surviving victims, their families and many others have called it a terrorist attack due to the fact that the perpetrator had been in contact with an al-Qaida cleric for some months prior to the attack.	31
Terrorism and Violent Extremism	Explain that on 15 April 2013, a particularly horrifying incident took place at the end of that year's Boston Marathon in Massachusetts. Two bombs exploded near the finish line of the race, killing three spectators and injuring hundreds more. The perpetrators were soon identified as two immigrant brothers with ties to Muslim extremists. After a four-day manhunt by federal, state, and local agencies, one brother was killed and the other was tracked down and captured. The surviving brother, Dzhokhar Tsarnaev, later confessed that their attack had been in retaliation for the U.S. involvement in the wars in Iraq and Afghanistan.	32-33
Terrorism and Violent Extremism	Explain that unfortunately, such acts as those described previously will continue to be a concern in the foreseeable future. Although a great deal of time and energy is continually expended by the military services and by other agencies of the federal, state, and local government to try to prevent them, it behooves all Americans to maintain personal vigilance and awareness of their surroundings and to report suspicious or potentially dangerous situations to proper authorities.	34-35
Cyber Warfare	Explain that the new millennium saw the introduction of a new form of information warfare, called cyber warfare. This refers to the intentional intrusion, called "hacking," into computers or computer networks by agencies of foreign governments for the purpose of sabotage or espionage. In the years since 2000, this type of Internet-based attack on all kinds of U.S. computer networks has steadily increased to the point that attempts to infiltrate networks in the United States, be it government, military, industrial, or commercial are now quite commonplace. The term 'cyber terrorism' refers to attempts by extremists or terrorists to damage or destroy vital computer networks by such means as the use of powerful computer viruses, or to use the Internet	36-39

Chapter 12 / Section 3: NS2-M1C12S3 – Ballistic Missile Defense

	to further their agenda. As with other physical forms of terrorism, it is often difficult to identify and track down the perpetrators of such attacks and to take effective countermeasures against the attackers.	
Cyber Warfare	Explain that it has been estimated that billions of dollars in losses have occurred due to computer-based industrial espionage in the United States. Also, a significant amount of classified material and information on technological developments within all the military services has been lost due to cyber-attacks on D.O.D. information networks.	40
Cyber Warfare	Explain in response to the possible threat to national security represented by these kinds of attacks, in May 2010, the U.S. Cyber Command was formed, headquartered at Fort George G. Meade, Maryland. The Cyber Command has component commands in all three military services. Its mission is to defend all Department of Defense computer networks against cyber-attacks and to ensure the freedom of action of the United States and its allies in cyberspace (the online realm of the Internet and other computer networks), as well as their ability to deny this freedom to potential adversaries when required. The Department of Homeland Security has a similar mission regarding other government and private and commercial users of the Internet.	41-42
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	43
Equipment Issues	Explain that the strain on the ships, aircraft, and personnel carrying out the many missions of the U.S. Navy in the new millennium has been unprecedented, particularly in the face of the increasing fiscal constraints of the last few years. Extended deployments, coupled with insufficient funding for periodic maintenance and overhaul, have taken a continuing toll on both hardware and people. Two simultaneous wars, along with budget cuts and caps, have undermined our nation's efforts to remain at military readiness.	44
Equipment Issues	Explain that insufficient funding for maintenance and overhaul has caused equipment to degrade prematurely. Deferring costly maintenance for radar and weapons systems has impaired <i>Aegis</i> cruisers and destroyers.	45
Equipment Issues	Explain that reducing the length of nuclear-powered aircraft carrier refueling cycles has cut short maintenance schedules. Service lives of carrier aircraft have been shortened by years due to the strain from unexpectedly high numbers of catapult launchings and arrested landings.	46
Equipment Issues	Explain that at the beginning of the millennium it was thought that, as a result of new construction and major rehabilitation of older ships, the U.S. fleet would have approximately 315 ships in service by 2012–13. Unfortunately, every year since the mid-2000s, the Navy has had to make do with less than 285 ships because of drawdowns in the shipbuilding and maintenance budgets. Currently, the required defense funding cut, or sequestration, is \$54.7 billion each year from 2014 through 2021.	47-48
Personnel Issues	Explain that the new millennium has been a challenging time as well for personnel in all U.S. military services, especially the Navy. The demands of the two simultaneous wars in Iraq and Afghanistan resulted in many men and women serving multiple tours of duty in the war zones, in some cases five or six or even more. As has been previously mentioned, large numbers of Sailors found themselves serving in nontraditional roles in the conflicts, especially in Afghanistan. Many Navy Reservists were recalled with little advance notice from civilian life to active duty for year-long individual assignments, as were many Marine reserve units. Because of increasing use of all manner of improvised	49

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	explosive devices by insurgents in both wars, there was a steady increase in the number of war veterans returning home with debilitating head injuries or amputations. Severe posttraumatic-stress disorder (P.T.S.D.) is another common problem faced by many veterans of both wars.	
Personnel Issues	Explain on a more positive note, much progress continued to be made in the new millennium toward more fully integrating women into all aspects of military service, including roles formerly restricted only to men. Women had begun serving aboard surface warships and piloting combat aircraft during the 1990s, and they flew many combat support missions in both Iraq and Afghanistan. Nearly 250,000 women have served in all services in combat support roles in both wars. In November 2012, the first twenty-five of these graduated from submarine school and reported for duty. In January 2013, the Defense Department lifted a statutory ban that prohibited women from serving in frontline combat assignments and opened the way for them to volunteer to serve in these roles whenever qualified to do so.	50-51
Personnel Issues	Explain that in December 2011 Congress formally ended the previous prohibition of openly gay (homosexual) personnel of both sexes from serving in the U.S. armed forces.	52
A Look Back – and Ahead	Explain that the last few decades were very challenging times for our Navy. In the Vietnam years of the sixties and seventies, the Navy had nearly a thousand ships and 600,000 people in uniform. By 2005, these numbers had declined to under 285 ships and 370,000 people and this despite the demands of fighting two simultaneous wars. Joint operations with the other services and combined operations with multinational forces are now the rule rather than the exception. Technology continues to drive toward new concepts in weapons and equipment at an ever-accelerating pace.	53-54
A Look Back – and Ahead	Explain that steadily increasing budgetary constraints since the demise of the Soviet Union and the end of the Cold War have forced us to realize that we cannot always acquire every new weapon or program we may want nor all the new ships we may need. The international drug trade and violent extremism and terrorism at home and abroad have shown that our modern enemies are not always easily identifiable and often cannot be directly attacked, at least not by traditional means.	55-56
A Look Back – and Ahead	Explain that in spite of all this, our Navy continues to perform its mission with distinction, meeting every challenge both at home and abroad. Many trying times surely lie ahead as we continue to try to deal with the tragic events that have afflicted our country in recent years, but there is no doubt that each generation of Navy men and women will do its best to continue to protect America and our way of life from all enemies, both foreign and domestic.	57
Review Question	The Review Question is, “Discuss some of the ways that U.S. military service has changed in the new millennium.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	58
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	59
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	60

Chapter 12 / Section 3: NS2-M1C12S3 – Ballistic Missile Defense

III. Supplemental Activities -

A. In class Activity:

Supplies required: CPS Clickers

When: The in-class activity should take place at the end of the lesson

In-Class: Ask cadets to have a conversation regarding these questions:

“What are some ideas you have to encourage more people to sign up for the nation’s armed services?”

“If you were in charge of marketing the Navy to entice others to join, what would your slogan be?”

Vote on the ideas using classroom response devices

B. Take Home Activity: Cadets will complete the North Korea timeline activity. Have the cadets create a timeline that illustrates the history of U.S. / North Korea Relations using the list on the handout. Tell them to find out when each event occurred and then place them appropriately on the timeline. Once complete, use the timeline to answer the questions on the handout.

- North and South Korea join the United Nations (1991)
- The Korean War (1950 to 1953)
- Cease Fire/ DMZ (1953)
- N. Korea removed from U.S. Terrorist Watch List (2008)
- North Korea declares it is in a State of War with South Korea (2013)
- Kim Il Sung Dies (1994)
- George Bush refers to N. Korea as a part of the “Axis of Evil” (2002)
- Kim Jong-un formally takes over ruling party leadership (2011)
- N. Korea captures the *U.S.S. Pueblo* (1968)
- Kim Jong-il take power (1994)
- North Korea says it has missiles that can hit the U.S. mainland.(2012)
- A U.S. reconnaissance plane is shot down by North Korea (1969)
- North Korea fires a missile over Japan (1998)
- North Korea withdraws from the Nuclear Non-Proliferation Treaty (N.P.T.) (2003)
- North Korea claims to test a nuclear weapon for the first time.(2006)
- Kim Jong-il dies (2011)
- North Korea declares it is in a State of War with South Korea (2013)

IV. Evaluation - see CPS database for chapter test questions.

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Activity 1: Take Home Activity: North Korean Timeline

Name _____ Date _____ Class _____

Directions: Use the following events to create a timeline that illustrates the history of U.S. / North Korea Relations. Find out when each event occurred and then place them appropriately on your timeline.

Use the timeline to answer the following questions. You may need to do outside research to acquire the needed dates.

- North and South Korea join the United Nations
- The Korean War
- Cease Fire/ D.M.Z.
- N. Korea removed from U.S. Terrorist Watch List
- North Korea declares it is in a State of War with South Korea
- Kim Il Sung dies
- George Bush refers to N. Korea as a part of the “Axis of Evil”
- Kim Jong-un formally takes over ruling party leadership
- N. Korea captures the U.S.S. Pueblo
- Kim Jong-il take power
- North Korea says it has missiles that can hit the U.S. mainland
- A U.S. reconnaissance plane is shot down by North Korea
- North Korea fires a missile over Japan
- North Korea withdraws from the Nuclear Non-Proliferation Treaty (N.P.T.)
- North Korea claims to test a nuclear weapon for the first time
- Kim Jong-il dies
- North Korea declares it is in a State of War with South Korea

1. Using your timeline, how would you describe the relationship between the United States and North Korea?

2. If you were President of the United States, what would you do to improve the relationship between the two countries?

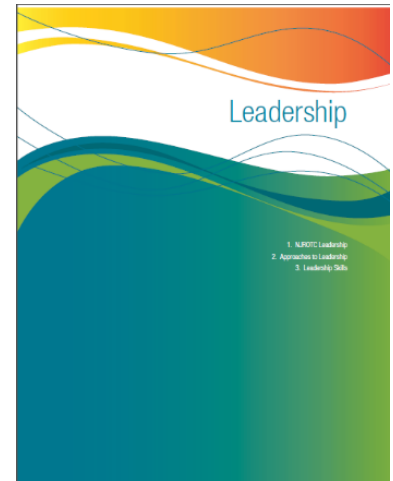
3. If you were President of the United States, what would you do to prevent North Korea from building up their nuclear weapons program?

MODULE 2: LEADERSHIP

Module Overview

Module Objective:

In this module you will develop a sound knowledge of the principles of effective leadership and the importance of discipline in NJROTC and elsewhere. Understand approaches to Leadership in civilian and military life and understand how influencing behavior contributes to effective leadership



Module Organization:

Chapter Number	Chapter Name	Instructional Section / PowerPoint
1	NJROTC Leadership	NS2-M1C1S1 – NJROTC Leadership
2	Approaches to Leadership	NS2-M1C2S1 – Approaches to Leadership
3	Leadership Skills	NS2-M1C3S1 – Leadership Skills

Module 2 Chapter 1: NS2M2C1 – NJROTC Leadership

What Students Will Learn to Do:

Learn the principles of effective leadership and importance of discipline

Skills and Knowledge to be Gained:

1. Cite two advantages of unit leadership
2. Explain the three things required for leadership positions to exist
3. Explain the relationship between good followership and good leadership
4. Explain that personal relationships determine a leader's overall effectiveness
5. Describe at least ten essential qualities of an effective leader

Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...
- RI.9-10.7. Analyze various accounts of a subject told in different mediums ...

Writing

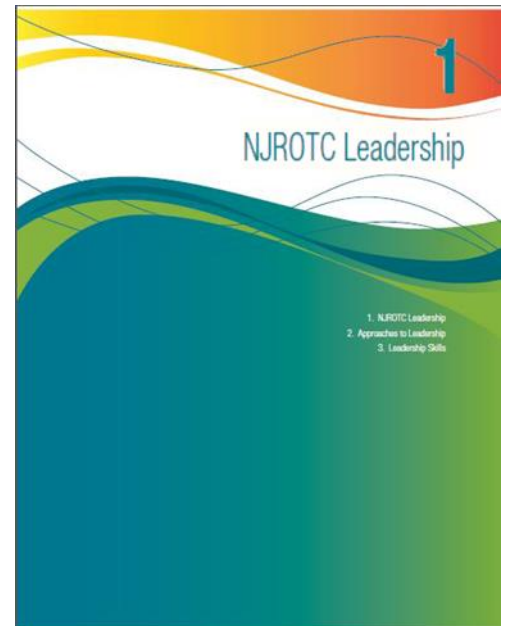
- W.9-10.1. Write arguments to support claims in an analysis of substantive topics or texts...
- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.9-10.8. Gather relevant information from multiple authoritative print and digital sources...

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...

Language

- L.9-10.2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...



Module 2 Chapter 1: NS2M2C1 – NJROTC Leadership

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

Chapter 1 / Section 1: NS2-M2C1S1 – NJROTC Leadership

(Section 1 of 1)

What Students Will Learn to Do:

Learn the principles of effective leadership and importance of discipline

Skills and Knowledge to be Gained:

1. Cite two advantages of unit leadership
2. Explain the three things required for leadership positions to exist
3. Explain the relationship between good followership and good leadership
4. Explain that personal relationships determine a leader's overall effectiveness
5. Describe at least ten essential qualities of an effective leader

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	Leadership Requirements	Check On Learning A
Follow The Leader	Check on Learning B	Qualities of Leadership	Loyalty	Courage, Physical, and Moral	Honor, Honesty, and Truthfulness	Faith	Sense of Humor
Modesty	Self-Confidence	Common Sense, Good Judgment, and Tact	Health, Energy, and Optimism	Sense of Responsibility	Concern for People	In Summary	
Review Questions	Closing Questions	Call for Other Questions					

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 1 / Section 1: NS2-M2C1S1 – NJROTC Leadership

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 2, Chapter 1. Place a checkmark beside the NS2-M2C1S1 PowerPoint presentation, and these two CPS question deck files: NS2-M2C1S1 - Key Terms and NS2-M2C1S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will review (1) the importance of unit leadership; (2) responsibilities of being a leader (3) the NJROTC cadets' role as leaders in the school towards your seniors, your subordinates, your job, and your unit as well as in your community; and (4) the importance of personal relations and (5) the essential qualities of leadership. This will help you prepare for the future, whether or not you choose to enter one of the military services.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-7
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “List 2-3 attributes that you have observed in effective leaders here at school.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on NJROTC Leadership.	8
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	9

Chapter 1 / Section 1: NS2-M2C1S1 – NJROTC Leadership

Introduction	<p>Explain that you have now had at least one year of NJROTC. You may have been advanced to Petty Officer Third Class or Petty Officer Second Class, with leadership duties in a squad or platoon. You may be a member of the Color Guard, drill team, or rifle team.</p> <p>Explain that if you have advanced to a higher level, that is great. If not, keep trying. You will also advance when you are qualified and when there are openings. In the meantime, you are an experienced cadet who can, and should, help the new young men and women who are coming into the unit as cadets in Naval Science 1. Everyone must help so the unit will be a good team.</p>	10-12
Introduction	Explain that as a Squad Leader, Assistant Squad Leader, Platoon Guide, or other leader within your unit, you will have special responsibilities during your unit's marching practices, parades, inspections, and other functions. Know your responsibilities. As a leader, you will have others to look after, guide, and train.	13
Introduction	Explain that your first rule must be to set the best example possible. Your own uniform should be neat, pressed, and ship-shape, with a clean cap cover, shirt, skivvy shirt, and shined shoes. Awards and insignia must be neat and without dangling threads. When questioned, it is better to be able to answer by showing, as well as telling. For example, "The NJROTC patch is sewn on the left sleeve of the shirt, like this". Another example would be, "Shoes should be polished to a bright shine, like this"; or, "The combination cap is put together with device centered and chin strap tight, like this." Your NJROTC Cadet Field Manual is a good reference on how to wear the uniform correctly.	14
Introduction	Explain that you will find that your own correct wearing of the uniform, taking directions, snappy saluting, and sharp marching will be a better guide than many things you say. Your subordinates will learn by watching and following your example. If you tell them how to do something and then do not do it that way yourself, you have wasted your time. In fact, you will have done both yourself and the unit damage. Subordinates will do as you do, before they will do as you say. Leadership and responsibility begin with setting the example yourself.	15-17
Leadership Requirements	Explain that leadership depends upon three things: the leader, the followers, and the job to be done. Each leader will have his or her own way of guiding, directing, and inspiring followers. Although the approach of each leader may be different, each may be equally as successful in getting good results.	18
Leadership Requirements	Explain that after learning to be good followers the first year, NJROTC cadets have many leadership opportunities at all levels. The NJROTC needs effective leaders in squad, platoon, company, and staff positions. Leaders are also needed for various teams, Color Guard, and committees. The effectiveness of the leaders at the top levels depends on the effectiveness of the leaders at the lower levels. Cadet officers rise to top positions by working their way up. As they mature in experience, age, and rank, they gradually become better leaders.	19-20
Leadership Requirements	Explain that there are few "born leaders." Even so-called natural leaders have to develop through experience. They must learn to handle increasingly complex situations as well as learn from their successes and failures. Some people, however, do have a flair for leadership, quickly developing confidence and poise in a leadership role. Perhaps they have the looks, stature, command voice, or other physical qualities that set them apart. Maybe they are outstanding students, good athletes, or inspiring speakers. Any of these things might give them a bit of a head start, but they must also have the initiative, desire, and willingness to become leaders. Sometimes people who were early leaders fade away as new leaders arise in the group. Some people make excellent leaders after a slow start. Leadership is not easily taught nor is it easily	21

Chapter 1 / Section 1: NS2-M2C1S1 – NJROTC Leadership

	learned, but leaders can be made.	
Leadership Requirements	Explain that a leader must be able to use his or her experience in each new situation, as well as learn something new. To improve, successful leaders must analyze themselves and their leadership style. In this way, they can learn which methods do not work and thus gradually develop skills that will help them do the job successfully. The NJROTC program seeks to help each cadet gain leadership experience that will be useful in almost any situation.	22
Check on Learning Questions A(Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	23
Follow the Leader	<p>Explain that having spent a year as a first-year cadet, you have experience as a follower. If you received a promotion, you must have done well. You are now in a position to guide and help new cadets in the unit this year.</p> <p>Explain that you already have learned that you must first be a good follower before you can become a good leader. Also, you know that even high-ranking cadet officers in your unit must take orders from the Cadet Commander, and he or she in turn from the Naval Science Instructors. They, in turn, must follow school and program directives, and so on.</p>	24
Follow the Leader	Explain that as a leader you must be more disciplined than your followers because you will influence them. You must always set a good example because your subordinates will imitate your bad actions as well as your good. You must be careful that your appearance, dress, and conduct set high standards at all times.	25
Follow the Leader	Explain that as a cadet officer, you will not make decisions upon which the lives of others or the success of a critical mission depend. Nevertheless, your decisions will still be important to your unit. However, your experience at this level is a good beginning. You are the one who must study the pros and cons of an issue, collect input from your group, and then make the decision on how the group can best get the job done. You will have a responsibility toward your seniors, your subordinates, your job, and your unit. You will have to develop the habit of working effectively with others. There are three basic things to remember as you develop your leadership abilities: Know your business. Know yourself. Know your personnel.	26-27
Follow the Leader	Explain that the NJROTC has several optional programs and other activities in which you can take part to help you learn to be a good cadet officer and leader. Units can send interested cadets to basic leadership training and leadership academies, summer programs of about two week's duration at one of several military bases around the country. In addition, weekend field trips to various Navy bases, ships, and air stations are a good way to learn more about the Navy and its people. These programs and activities will greatly build your knowledge of the Navy and the military and the skills required to lead people effectively.	28
Follow the Leader	Explain that to do his or her job a leader must associate with seniors, peers, juniors, and the general public. These associations are called personal relations. Just as in the regular Navy, a cadet's relationships with all these groups will greatly influence how effective a leader he or she is.	29

Chapter 1 / Section 1: NS2-M2C1S1 – NJROTC Leadership

Follow the Leader	Explain that few truly great leaders of the world have reached their positions without having outstanding personal and social traits. These traits make up the leader's personality. Personality is the ability to talk to large groups and still make each person feel that he or she is being talked to alone. It is a "magnetic" personal quality that allows the leader to satisfy every person's desire for recognition. This is a basic requirement for anyone who wants to lead others. Explain that many great leaders of the past including President Abraham Lincoln, President Andrew Jackson, and Admiral Chester Nimitz, achieved much because they got along so well with people. People felt comfortable and welcome in their presence.	30
Follow the Leader	Explain that this special quality of leadership is really just an unselfish, friendly interest in people. It may be just a cordial "good morning" when starting the day, or a question about how work is going. Such interest from the senior makes the junior feel important. It shows a subordinate that he or she is valued as an individual.	31
Follow the Leader	Explain that a leader must have the cooperation of those with whom he or she is working. A leader with a warm, friendly personality makes people feel that he or she is glad to be a member of their organization. This feeling, this being proud of the other people in the same group, is called esprit de corps or, that is, pride in the organization.	32
Follow the Leader	Explain that respect of subordinates is not something that can be commanded; it must be earned. Subordinates expect their leaders to have an interest in and concern for their affairs. However, a leader should not be their "buddy," but rather their counselor and guide. A leader must be friendly and interested in his or her followers. Such friendly concern does not destroy discipline or break down the chain of command. If juniors feel that their leader knows their needs and will do everything he or she can for them, they will trust that leader.	33
Follow the Leader	Explain that if there is one key to successful leadership it is probably fairness. This is the one thing that every effective leader must practice. Subordinates should receive all to which they are fairly entitled. Fairness in an NJROTC unit means things like an equal opportunity to serve as leaders, an equal chance to work on projects and committees or to be on the Color Guard and drill teams, and recognition for jobs well done.	34
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	35
Qualities of Leadership	Explain that a person must have certain traits or characteristics in order to be an effective leader.	36
Loyalty	Explain that loyalty to country is a must for anyone in the military service. There is also loyalty to seniors, which means a willingness to serve them reliably and well. Similarly, there is loyalty to juniors, which means having consideration for their welfare and interests. Explain that there are other forms of loyalty, that is, loyalty to relatives, to friends, to beliefs, and finally, to oneself. As the well-known saying goes, "To thine own self be true, and it must follow as the night the day, thou canst not then be false to any man."	37
Courage, Physical, and Moral	Explain that the most traditional trait of a leader is courage. At one time this meant physical courage only, in other words, deeds of daring which involved the danger of death. Today it implies a willingness to attempt a mission in spite of its danger. Training, education, drill, and professional preparation are the best ways to lay a foundation for physical courage.	38

Chapter 1 / Section 1: NS2-M2C1S1 – NJROTC Leadership

	<p>Explain that moral courage means being able to stand up for one's beliefs, to call things as honestly seen, to admit a mistake. Most people know the difference between right and wrong. Most try to remain true to their principles in spite of fears and pressures by others. It takes moral courage to do right in the face of these things. Most young leaders will make occasional honest mistakes. No one, however, should attempt to lie or "cover up" or intentionally break the law.</p>	
Honor, Honesty, and Truthfulness	<p>Explain that honor means a proper sense of right and wrong. An NJROTC cadet is expected to be a person of honor whose integrity is above reproach. Honor is an important characteristic for any person. Honesty means refusing to lie, cheat, or steal. Honesty is so important to leadership that it is written into the honor codes at all the service academies. There are no degrees of honesty. Either individuals are honest, or they are not. Truthfulness means telling things the way they truly are, without deception. Navy people must be able to put the greatest confidence and trust in their shipmates. This is possible only if they are men and women of honor, honesty, and truthfulness. A leader must have these qualities if he or she is to command respect, confidence, and obedience.</p>	39
Faith	<p>Explain that faith is another word for confidence. There are several kinds of faith: faith in oneself, faith in one's leaders, faith in subordinates, and faith in the cause for which one is working. Faith in oneself is self-confidence. Self-confidence increases the respect one receives from others.</p> <p>Explain that if one loses faith in one's leaders and subordinates, he or she trusts no one and is loyal to none. Such a person loses the trust and loyalty of seniors and juniors alike.</p> <p>Explain that faith in a cause is essential to victory. A weakening of faith is almost always followed by a lowering of morale, demoralization, disintegration, and defeat. A naval leader who believes with all his or her heart in the service, the fleet, his or her ship, captain, division, and himself or herself will see this attitude reflected in everyone around him or her.</p>	40-41
Sense of Humor	<p>Explain that the ability to see humor in a situation is a valuable asset. One should not play the clown, however. Often, a humorous remark at the right time and place can ease tension and restore morale. Laughter can be like a curing medicine. A leader who can see humor in a difficult situation, when such exists, does much to relax his or her subordinates, restore their confidence, and cause them to think positively.</p>	42
Modesty	<p>Explain that a truly great person can afford to be modest; lesser individuals cannot afford to be otherwise. A truly great person can be modest because his or her accomplishments speak louder than any words. While a person should be proud of strengths and abilities, one must not develop too high an opinion of oneself. Modesty, quiet dignity, even humility indicate great character and experience. Self-magnification is improper, often unpleasant, and normally unsuccessful. Excessive concern with one's own importance is likely to cause a leader to consider mainly his or her own welfare instead of the welfare of subordinates and the command.</p>	43
Self-Confidence	<p>Explain that self-confidence develops with experience, increased skills, professional knowledge, and a positive attitude. Self-confidence helps eliminate the fear of failure. To develop self-confidence, a leader must be willing to accept responsibility and tackle those jobs that he or she may at first feel inadequate or uncomfortable completing. If an occasional failure does occur, remember that it has happened to everyone at one time or another. The ability to bounce back, to learn by experience, and to do a better job next time marks a leader.</p>	44

Chapter 1 / Section 1: NS2-M2C1S1 – NJROTC Leadership

Common Sense, Good Judgment, and Tact	<p>Explain that common sense and good judgment enable a person to make good decisions. Common sense means being able to see and react to things as they really are. Good judgment comes with training and discipline and means the ability to analyze facts and draw correct conclusions. The more knowledge a person has, the better qualified the person is to make good judgments. Tact is the ability to use good judgment to speak and act in a diplomatic way, so as not to offend either one's seniors, peers, or juniors.</p> <p>Explain that good leaders use common sense and good judgment in solving problems. They take into account similar experiences of others. They recognize and appreciate the needs and personalities of their subordinates.</p>	45-46
Health, Energy, and Optimism	<p>Explain that these attributes cannot exist apart from one another. Good health is a priceless asset that few appreciate until it is lost. A good leader will learn when to delegate some jobs in order to avoid harming his or her health through overwork. A planned program of daily exercise and periodic breaks from the job will keep the mind, body, and spirit sharp. Without health and personal energy, there is little stamina to withstand the demands of leadership.</p> <p>Explain that without health and energy, it is difficult to be optimistic. The optimistic person is a winner who looks at the bright side of the problem, expresses the "can do" attitude, and inspires both juniors and seniors with his or her enthusiasm to do the job. The opposite of an optimist is a pessimist. The pessimist always looks for reasons why a job can't be done. An effective leader is usually an optimistic winner.</p>	47-48
Sense of Responsibility	<p>Explain that this is the ability to see and do what must be done. It enables leaders to think independently and to use initiative in their jobs. A responsible leader will accept any assignment, whether pleasant or unpleasant, and stay with that task until it is properly completed.</p>	49
Concern for People	<p>Explain that NJROTC leaders must get to know their subordinates. They should know all cadets in their classes, and most in their unit. Field trips, unit drills, parades and formations, and social events such as military balls are good times to get to know other members of a unit. These activities build teamwork, which is a must for a successful unit.</p> <p>Explain that seniors must know their juniors in order to evaluate them. One of the most important jobs of a leader is choosing subordinates for promotion and advancement. A leader is known by the people he or she develops into new leaders.</p> <p>Explain that all hands must be kept informed. They should know what is going on, when things are going to happen, what is expected of them, and why. People are far more likely to cooperate if they know the reason they must do something.</p>	50-52
In Summary	<p>Explain that we have discussed some of the more important qualities of leadership, although there are many others. We have arrived at three conclusions:</p> <ul style="list-style-type: none"> • Leaders must know the capabilities of each member of their group, and how to coordinate them to do their assigned jobs well. • Leaders must be self-confident. They must have an optimistic winning attitude and be able to keep on track to accomplish the goal and know when it is better to stress the job or the individual. • Leaders must be willing to take increased responsibility. People who can carry out orders cheerfully, complete their work step by step, use their imagination to improve it, and then, when the job is done, look forward to their next job, and should be able to lead successfully. 	53-54

Chapter 1 / Section 1: NS2-M2C1S1 – NJROTC Leadership

Review Question	The Review Question is, “List 2-3 examples where you have seen a leader use humor in an effective way, to reduce tension or build team unity.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	55
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	56
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	57

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Whiteboard or MOBI; handout for Take Home Activity

When: This is a good activity to complete as a review of the lesson.

- With the class: Explain in this lesson you talked about the different essential qualities of leadership. The Cadets have been in the NJROTC program for a year and have seen many of these qualities in their cadet leadership. Some have had the opportunity to lead as well.
- Class participation: Individually have the Cadets decide which traits are easy to develop, and which are more difficult? What qualities are challenging to maintain, and which seem to come naturally? As a class, discuss the cadets’ answers and then have them discuss why some of the traits harder for some than others? Ask and discuss the question, “are leaders really made or are they only born?”

B. Take Home Activity: Unfortunately, we have leaders fail or make mistakes all the time. In today's media centric culture many of these mistakes are news worthy and we hear about them through a variety of sources. Find a current article or report about a leader that has made a mistake and is being reported about. Using correct grammar and punctuation, write a report about the essential quality of leadership this individual fail to meet. What could this leader have done instead of what is reported? What can you learn from this situation to make you a better leader? Some reports may only state that the individual is reported to have done something. Does it matter if they really did it or not?

IV. Evaluation - see CPS database for chapter test questions.

Chapter 1 / Section 1: NS2-M2C1S1 – NJROTC Leadership

Activity 1: Take Home Activity- Mistakes

Name: _____ Date: _____ Class: _____

Directions: Unfortunately, we have leaders fail or make mistakes all the time. In today's media centric culture many of these mistakes are news worthy and we hear about them through a variety of sources. Find a current article or report about a leader that has made a mistake and is being reported about. Using correct grammar and punctuation, write a report about the essential quality of leadership this individual fail to meet. What could this leader have done instead of what is reported? What can you learn from this situation to make you a better leader? Some reports may only state that the individual is reported to have done something. Does it matter if they really did it or not?

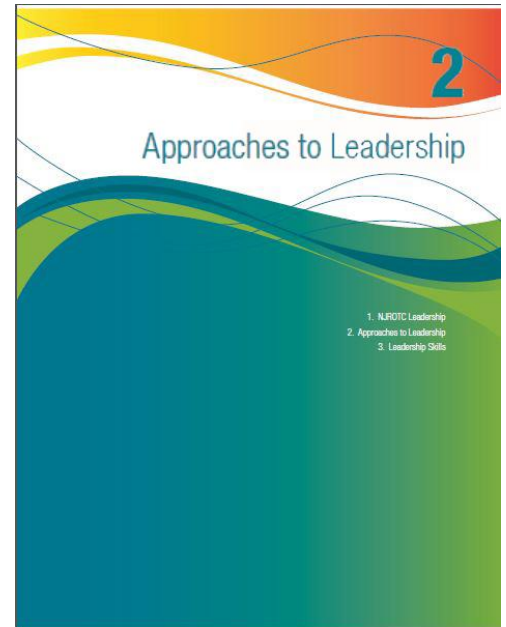
Module 2 Chapter 2: NS2M2C2 – Approaches to Leadership

What Students Will Learn to Do:

Understand the principles of effective leadership and importance of discipline

Skills and Knowledge to be Gained:

1. Describe the importance of authority in the Navy
2. Cite the differences between authority in civilian life and authority in the military
3. Explain the importance of self-discipline in both military and civilian life
4. Describe the requirements for discipline in unit drill ceremonies
5. Cite the major differences between a democratic style of leadership and an autocratic style of leadership
6. Cite five significant approaches to leadership
7. Describe four critical skills necessary for a leader to communicate effectively



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...

Writing

- W.9-10.1. Write arguments to support claims in an analysis of substantive topics or texts...
- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately ...
- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically ...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks...

Language

- L.9-10.3. Apply knowledge of language to understand how language functions in different contexts...

Module 2 Chapter 2: NS2M2C2 – Approaches to Leadership

- L.9-10.5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

Chapter 2 / Section 1: NS2-M2C2S1 – Approaches to Leadership

(Section 1 of 1)

What Students Will Learn to Do:

Understand the principles of effective leadership and importance of discipline

Skills and Knowledge to be Gained:

1. Describe the importance of authority in the Navy
2. Cite the differences between authority in civilian life and authority in the military
3. Explain the importance of self-discipline in both military and civilian life
4. Describe the requirements for discipline in unit drill ceremonies
5. Cite the major differences between a democratic style of leadership and an autocratic style of leadership
6. Cite five significant approaches to leadership
7. Describe four critical skills necessary for a leader to communicate effectively

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	Authority in Civilian Life	Discipline and Self-Discipline
Faith	Check On Learning A	Leadership Styles	Range of Leadership Styles	Leadership and Communication (A)	Check on Learning B	Leadership and Communication (B)	In Summary
Review Questions	Closing Questions	Call for Other Questions					

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 2 / Section 1: NS2-M2C2S1 – Approaches to Leadership

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 2, Chapter 2. Place a checkmark beside the NS2-M2C2S1 PowerPoint presentation, and these two CPS question deck files: NS2-M2C2S1 - Key Terms and NS2-M2C2S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>You have all noticed the different ways in which your teachers structure their classes. Some teachers are very strict while others appear to let you get away with almost anything. In this lesson we will talk about some of the different approaches to leadership and the value of each approach. Each approach is as unique as the person in the role of the leader.</p> <p>We will also discover the two special burdens that go along with leadership in the Navy and learn how authority in civilian life differs from authority in the Navy.</p> <p>One of the most important traits of a good leader is communication. We will discuss the four basic skills which you should acquire in order to be the best leader possible. These four skills are reading, writing, listening, and speaking. You will need to practice all of these skills in this class.</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-7
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “What do you think it means to be “self-disciplined” and why is it important?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on NJROTC Leadership.	8

Chapter 2 / Section 1: NS2-M2C2S1 – Approaches to Leadership

Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	9
Introduction	<p>Explain that having discussed traits of leadership, let's talk about how to apply one's abilities in the leadership role. This is a question all leaders must answer for themselves. Different leaders approach problems in different ways; not all may get good results.</p> <p>Explain that there can be no doubt about who has authority. The person in authority is the person in charge. This is the best definition for authority in the Navy.</p> <p>Explain that to be in charge is exciting. As with everything else in this world, however, there is another side to the coin. In fact, in the Navy there are two special burdens on the leader. With authority goes responsibility, and with them both goes accountability.</p>	10
Introduction	<p>Explain that whoever has authority is also held accountable for all that occurs in that command. A leader who is unsuccessful in a mission or brings disaster to the ship or crew, must answer for what happened. A Naval leader is accountable for deeds and results—not good intentions. It must be this way. Without this accountability, there would be no confidence or trust in those who are in authority. Men and women will not trust leaders who are not accountable for what they do.</p> <p>Explain that the commanding officer has total responsibility for all things within his or her command. He or she is totally responsible for the performance of the ship and crew. There is no way to avoid or delegate this responsibility.</p>	11-12
Authority in Civilian Life	<p>Explain that authority is a little different in civilian life. It does not carry the same amount of accountability. It does, however, mean a responsibility to influence and guide the things others do. Civilian leaders may be held accountable in many cases only if they break the law.</p> <p>Explain that in spite of this, they should still be willing to accept the responsibility of carrying out their acts in a highly professional manner. Your parents have authority over you because they are responsible for your actions. Further, they are legally responsible for what you do until you are legally an adult.</p>	13
Authority in Civilian Life	<p>Explain that your teachers have the responsibility for teaching you and are held accountable by the principal and superintendent. Local police, civil, and school authorities have a responsibility to keep law and order. They get their authority from the people, through laws.</p> <p>Explain that your Naval science instructors have authority over you and your fellow cadets. This authority arises from the agreement each cadet makes when he or she becomes a member of the Cadet Corps. The authority also comes from the school district and the Navy. These authorities require your instructors to present the NJROTC course in the best way possible.</p>	14
Discipline and Self-Discipline	<p>Explain that discipline is an orderly way of doing things. In both military and civilian life, discipline is a way of guiding people toward the right actions. Discipline, properly handled, is not harsh or unfair. Therefore, it is not something to fear.</p>	15

Chapter 2 / Section 1: NS2-M2C2S1 – Approaches to Leadership

Discipline and Self-Discipline	Explain that self-discipline is the control of yourself. It is an inner sense that comes from the experiences and training you have had. There are certain jobs you have to do yourself—like keeping your room clean, being home on time, attending classes, doing your homework, and wearing your uniform when required. Self-discipline is what makes you do those things even when there are other things you’d rather do.	16
Discipline and Self-Discipline	Explain that the NJROTC program is designed to teach self-discipline. It helps cadets learn how to manage their time well. Cadets learn to follow directions and make decisions. These are the traits needed by leaders in both military and civilian life. Without orderly conduct, it would be impossible for a military organization to function.	17
Discipline and Self-Discipline	Explain that self-disciplined people make the military and all society, work. Self-disciplined people are dependable. They will take care of their responsibilities on their own. Self-discipline begins with self-control. This must be practiced. Self-control will help build better habits. The person who has self-control can stand up to hardship and danger. Explain that self-disciplined people follow regulations well. They have high morale.	18
Drill and Discipline	Explain that one way of learning self-discipline is to take part in unit drill and ceremonies. In order for drills to be good, the unit must practice regularly until every routine is perfect. Drill teaches self-discipline because it requires the unit to act as one person. Every cadet must know what to do because everyone must act together. When the order, “By the right flank, march!” is given, everyone must carry out the order at the same time. Anyone not doing so will not only stick out like a sore thumb, but he or she may also get run over!	19
Drill and Discipline	Explain that drill in uniform can give each cadet a sense of belonging. It is a matter of “All for one, one for all!” When cadets wear the uniform correctly, they will look good. By “looking good” as a unit, each cadet has a sense of belonging to a super group. Drilling is not a punishment or an endless routine. It is a good way to build pride in each member of a unit, and in the whole unit.	20
Check on Learning Questions A(Lesson questions 3-4)	Check in on student’s understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	21
Leadership Styles	Explain that there are several styles of leadership. Each is very different from the other. They range from the autocratic to the democratic styles. Most leaders’ styles fall somewhere in between the two extremes.	22-23
Leadership Styles	Explain that the autocratic or authoritarian style of leadership is centered on the leader. It is direct and often impersonal. Subordinates don’t openly question this leader’s commands. They are seldom free to use their own initiative. The emphasis is on carrying out orders. Explain that the autocratic leader uses position as the basis for leadership. He or she isn’t much concerned about relationships with subordinates. This approach won’t build a closely-knit group. It doesn’t encourage a free exchange of ideas between the leader and the group. Groups working under this type of leader produce well for short periods of time, when the leader is present. Explain that the democratic style means participation of followers, as well as the leader, in the leadership process. It is good for long-term situations. Explain that the democratic leader encourages the group’s members to help set up procedures, make decisions, and discuss problems. To make the democratic style work, a leader needs cooperation from his or her people. The democratic leader can encourage his or her	24

Chapter 2 / Section 1: NS2-M2C2S1 – Approaches to Leadership

	subordinates to do their part. They will accept his or her leadership. Then everyone will be more willing to work to get the job done. Explain that the democratic leader allows people some leeway or freedom in carrying out their tasks, as long as they get the job done. The people doing the job can then share in the authority for getting it done. Explain that democratic groups produce better over longer periods of time than autocratic groups do. They can also keep producing when the leader is not present.	
Range of Leadership Styles	<p>Explain that within the range of leadership styles from autocratic to democratic, there are five different approaches to leadership:</p> <ul style="list-style-type: none"> • Telling • Selling • Testing • Consulting • Joining 	25
Range of Leadership Styles	Explain that in the telling style, the leader keeps all authority and gives the group little freedom. The leader decides and the group follows. The group does not take part in the decision making.	26
Range of Leadership Styles	Explain that in the selling style, the leader “sells” and the group accepts. The leader makes the decision, then persuades the group that this decision is the “best” for the group. The leader shows how the group will benefit from carrying out the decision.	27
Range of Leadership Styles	Explain that in the testing style, the leader tests, the group reacts, and then the leader decides what to do. The leader states the problem and picks a possible solution. He or she lets the group react to this solution and may accept suggestions. He or she then makes the final decision and informs the group.	28
Range of Leadership Styles	Explain that in the consulting style, the leader presents the problem and asks for ideas from the group members. The group makes recommendations. The leader then selects a solution and informs the group of his or her decision.	29
Range of Leadership Styles	Explain that in the joining style, the group decides and the leader follows. Here the leader is just another member of the group. He or she agrees to carry out whatever decision the group makes.	30
Range of Leadership Styles	Explain that when delegating authority, it is important to set clear and concise limits for the individual or group to operate within, as well as to specify the goal and any time constraints that may apply. Then, as long as the individual or group can stay within the given limits, decisions as to how to proceed can be made by the individual or group without any further presence of or direction by the leader. Should it become necessary to exceed the limits, the leader must be so advised in all except emergency conditions before proceeding. Depending on the situation, alternatives may be presented for consideration and approval by the leader, or further directions may be requested from him or her.	31
Leadership and Communication	Explain that to become a good leader one has to be able to communicate. The four skills necessary for communication are reading, writing, listening, and speaking. Let’s discuss each of these briefly.	32
Leadership and Communication	Explain that the ability to be an effective reader is essential to any leader. He or she must be able to read directives and understand them so he or she can have the group carry them out. On longer articles, instructions, or books, it is a good idea to scan the material first, to pick out the main ideas. Next, the material should be read for details.	33

Chapter 2 / Section 1: NS2-M2C2S1 – Approaches to Leadership

Leadership and Communication	Explain that the second skill is to write in a way that others understand. The leader must often give written orders and instructions, so writing is a very important skill.	34
Leadership and Communication	<p>There are four important steps to be followed for effective writing. These are:</p> <p>Step 1. Clarify your purpose for writing. Be able to say why you are writing, who will read it, and what you expect the reader to do after reading it.</p> <p>Step 2. Limit the subject to material that suits your purpose as stated in Step 1. Do not waste readers' time with extra material.</p> <p>Step 3. List your ideas: List ideas for your reader. As you read and research, write down ideas and change them later if necessary.</p> <p>Step 4. Organize your ideas into groups: Use an outline to organize and plan. Main ideas are followed by important subheadings, then by supporting information</p>	35-36
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	37
Leadership and Communication	Explain that the art of listening effectively is picked up through practice and hard work. Poor listeners often try to place the entire burden on the speaker. There also are persons who want only to hear themselves speak. This is no way to build respect, or to manage people effectively.	38
Leadership and Communication	<p>Explain that by practicing the following rules, anyone can become a better listener. A good listener will be a better leader.</p> <ol style="list-style-type: none"> 1. Get ready to listen. Do not place all the responsibility on the speaker. You must be alert! 2. Take the responsibility for understanding. Do some thinking as you listen. If you just listen to words, you will miss the purpose of the speech. In your mind, put the speaker's ideas into your own words. To be certain, repeat what you thought you heard. Don't go away in doubt. 3. Listen to understand, rather than to disagree. Listen and wait. Try to understand first and to evaluate second. Emotions should not cloud the matter. Question only after a speech or lesson is finished. 4. Listen for the main ideas. If you are listening to a teacher or other speaker, take notes. Come to classes and lectures prepared to do so. Taking notes will make you more alert for the main ideas. Alert listening requires effort. It is still the best way to get knowledge and understanding. 	39-40
Leadership and Communication	<p>Explain that the fourth skill is speaking. Everyone speaks, but not everyone effectively communicates! A speaker must make listeners understand what he or she is trying to say. You probably have listened to someone give directions and been more confused by what he or she said. Obviously, that person did not communicate effectively.</p> <p>Explain that a speaker should use words that the listeners will understand. You will "turn off" your listeners if you use words they don't understand.</p>	41

Chapter 2 / Section 1: NS2-M2C2S1 – Approaches to Leadership

Leadership and Communication	Explain that since leadership means getting things done through other people, you must be able to speak well. Of course, giving orders or instructions is not the same as giving a speech. But the same rules hold true in either case. These rules can be used for any speaking you may have to do as a student, cadet leader, or public speaker.	42
Leadership and Communication	<p>Explain that to speak well, you must organize your materials. There are five basic steps for preparing an effective speech. Some steps are similar to those for writing a paper.</p> <p>Step 1. Determine the purpose for the speech. Having “zeroed in” on your purpose, stick to it. Don’t wander in your research or your writing.</p> <p>Step 2. Narrow the scope of your topic. Do not try to cover too much in one speech. You will bore your listeners if you do. Most really good speeches can be given in fifteen minutes or less. The longer the speech becomes, the sleepier the audience becomes. They tune you out.</p>	43
Leadership and Communication	<p>Step 3. Choose a subject of interest to you and your audience. Keep in mind the maturity of your listeners. Do not rely just on what you know about the subject. Conduct research. Use examples such as stories, events, and people. Be sure your information is correct!</p> <p>Step 4. Make an outline to organize your speech. Note facts and figures so you don’t make mistakes.</p> <p>Step 5. Practice your speech. Say it in front of a mirror or use a tape recorder. Time it. Listen to yourself. Plan to use gestures. “Running through” your speech aloud a few times will give you confidence.</p>	44-45
Leadership and Communication	<p>Explain that the best speeches use what is called “three part communication” or 3 Part Comm.</p> <p>Explain that the name implies, there are three separate parts to guide your audience’s attention during your presentation:</p> <ol style="list-style-type: none"> 1. Introduction – Tell your audience what you are going to tell them 2. Body – Tell them! Hit your key points in the same order as you outlined in the introduction 3. Close – Tell your audience what you told them, including reinforcing key points and wrapping up your speech with a “thank you” 	46-47
In Summary	By using the rules and guidelines reviewed today, you can improve your leadership and communication skills significantly.	48
Review Question	The Review Question is, “List 2-3 reasons why Military drill helps cadets develop self-discipline.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS (Random Pick a Student) mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	49
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson with follow-up reinforcement and discussion as appropriate.	50

Chapter 2 / Section 1: NS2-M2C2S1 – Approaches to Leadership

Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	51
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III. Supplemental Activities -

A. In Class Activity: Make a peanut butter and jelly sandwich.

Supplies required: Supplies to make a peanut butter and jelly sandwich and a lot of napkins.

When: This is a good activity to do anytime during the lesson. This is an exercise in giving good oral directions and leadership styles.

- With the class: Today, I am going to make a peanut butter and jelly sandwich for a couple of you. Select a group of four cadets and select one of them as the leader. Tell the group that they will be helping you to make the sandwich for them. Additionally, only the leader may give you directions, but all the cadets in the group can help. One last rule, the cadets helping may not watch you make the sandwich while they are giving directions.

Many of you have done this exercise before, remember to take their directions either literally or absurdly as you like. The object is to show how difficult it can be to lead a group and to give verbal directions (orders). When they are finished creating their sandwich, be sure they have you divide it up as part of their directions and let them have a snack (this is where a lot of napkins will probably be required).

- Class question: Do you want to eat the sandwich they made? What could the leader have done differently? Did the rest of the group help, and what type of leadership style did the leader use - telling, selling, testing, consulting, joining or a combination?

B. Take Home Activity: Today, we discussed discipline and self-discipline. Using the four steps discussed today on effective writing, write a brief essay on the importance of discipline within your NJROTC unit. How do you as a cadet support greater discipline in your unit, and what do you do to encourage greater discipline from other cadets?

IV. Evaluation - see CPS database for chapter test questions.

Chapter 2 / Section 1: NS2-M2C2S1 – Approaches to Leadership

Activity 1: Take Home Activity- Effective Writing

Name: _____ Date: _____ Class: _____

Directions: Today, we discussed discipline and self-discipline. Using the four steps discussed today on effective writing, write a brief essay on the importance of discipline within your NJROTC unit. How do you as a cadet support greater discipline in your unit, and what do you do to encourage greater discipline from other cadets?

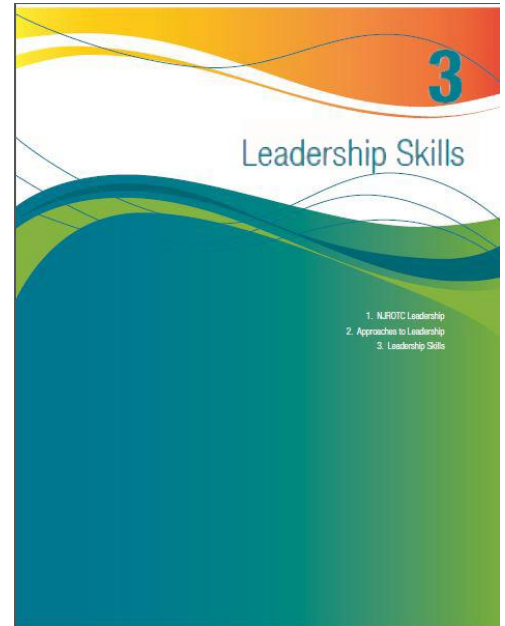
Module 2 Chapter 3: NS2M2C3 – Leadership Skills

What Students Will Learn to Do:

Understand the principles of effective leadership and importance of discipline

Skills and Knowledge to be Gained:

1. Describe Maslow's theory as it relates to leadership
2. Describe those methods Navy leaders use to increase the motivational levels of naval personnel
3. Describe those elements that contribute to good moral
4. Cite eight of the general rules for building morale
5. Describe three skills an effective leader uses when holding a conversation with subordinates
6. Explain five important factors an effective leader must remember about leadership



Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.2. Determine a central idea of a text and analyze its development over the course of the text...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...

Writing

- W.9-10.1. Write arguments to support claims in an analysis of substantive topics or texts...
- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately ...
- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Speaking & Listening

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
- SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically ...
- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Module 2 Chapter 3: NS2M2C3 – Leadership Skills

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

Chapter 3 / Section 1: NS2-M2C3S1 – Leadership Skills

(Section 1 of 1)

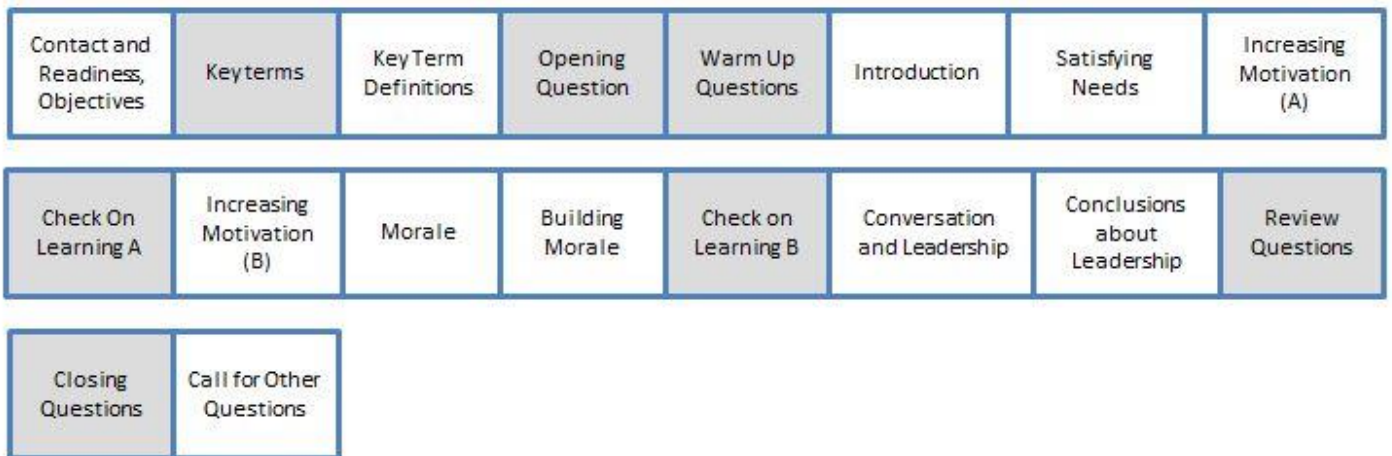
What Students Will Learn to Do:

Understand the principles of effective leadership and importance of discipline

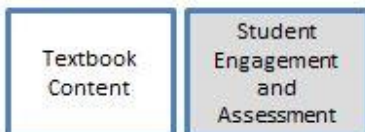
Skills and Knowledge to be Gained:

1. Describe Maslow's theory as it relates to leadership
2. Describe those methods Navy leaders use to increase the motivational levels of Naval personnel
3. Describe those elements that contribute to good morale
4. Cite eight of the general rules for building morale
5. Describe three skills an effective leader uses when holding a conversation with subordinates
6. Explain five important factors an effective leader must remember about leadership

LESSON FLOW OUTLINE



Key:



Chapter 3 / Section 1: NS2-M2C3S1 – Leadership Skills

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 2, Chapter 3. Place a checkmark beside the NS2-M2C3S1 PowerPoint presentation, and these two CPS question deck files: NS2-M2C3S1 - Key Terms and NS2-M2C3S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we are going to study how influencing behavior can affect leadership. Individual motivation is a topic which has been researched thoroughly over the past several decades and yet it remains a topic with many more questions than answers. Why is one person motivated to lead, while others are content to follow? Why do some people consistently do top-quality work, while others consistently do poor work?</p> <p>Finally, what is it that causes some people to do well in every endeavor they undertake? We will examine these and many other topics. By understanding the importance of individual needs and emotions and by recognizing how conflict contributes to the person as a whole, we can see how some people can be highly motivated while others have little motivation.</p> <p>Everyone has the same basic needs for air, water, food and shelter. Beyond those basics, your other needs will vary depending upon your status in life. In this lesson, we are going to look at how man's basic needs influence behavior, job needs, motivation, and morale. We will discuss Maslow's hierarchy of needs and some of the factors for increasing motivation and building morale—all qualities you will need to become a good leader. Some other factors of leadership, as they relate to human needs, will be covered when we discuss how to start a conversation, how to listen, and how to end a conversation. These skills are very important to a true leader. Great leadership begins with learning how to identify the needs of your personnel, how to motivate them, and how to communicate with them.</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6

Chapter 3 / Section 1: NS2-M2C3S1 – Leadership Skills

Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “List 2-3 things that make a person want to do a good job on a task.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on leadership skills.	7
Warm-Up Questions(Lesson questions 1-2)	Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions. Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.	8
Introduction	Explain that people behave in ways that will best satisfy their needs. Survival—the need for food, air, and water—is the most basic human need. Higher needs, such as the need for friends, job, and respect, are felt only after the most basic physical and safety needs are satisfied. Explain that food and safety alone seldom bring happiness and a sense of accomplishment. The satisfaction of higher needs brings a sense of well-being and pride. These are necessary for an intelligent, mature human being. While survival needs are quite similar for all people, higher needs vary greatly among individuals mainly because of the environment in which the individual has grown up.	9-10
Satisfying Needs	Explain that it is not necessary to talk about the basic needs for food, water and shelter. Everyone understands these things. A hungry person will seldom work well, for his or her mind is on an empty stomach and visions of a good meal. Once that need is satisfied, the person’s job and desire for approval, recognition, and achievement will quickly take over. These higher needs may never be completely satisfied. This is probably a good thing, for this might stop new ideas and limit initiative.	11
Satisfying Needs	Explain that one of the more popular writers on the topic of people’s needs as motivators is Abraham Maslow. According to Maslow, needs are arranged from the lowest, such as food and shelter (the physiological), to the highest (self-fulfillment) in an order called the hierarchy of needs. In this theory, individuals will try to satisfy all or nearly all of the needs at lower levels before they are ready or motivated to go after those at higher levels. For example, if someone suffers from hunger, most of his or her energy will be spent in finding food, not in seeking a sense of belonging or knowledge, until the need for food is satisfied; and so on.	12-13
Satisfying Needs	Explain that a leader, therefore, must be sure that the basic needs of subordinates are satisfied. He or she must then try to satisfy their higher needs. A leader can do this by ensuring that their work gives them the rewards of belonging, status, and getting ahead. The leader must assign jobs in such a way that each person does his or her part well and all work toward the goal. In this way, not only will individual needs be satisfied, but the group will develop teamwork.	14-15

Chapter 3 / Section 1: NS2-M2C3S1 – Leadership Skills

Satisfying Needs	Explain that most people seek growth in their work. People desire to learn new skills and move on to more challenging work. They want job responsibilities that use their technical knowledge and ability. They want to become skilled in their trade because mastery of the job adds to their sense of achievement. Doing a good job, first of all, must be personally rewarding.	16
Satisfying Needs	Explain that people also desire proper recognition for doing a job well. This increases the drive to succeed. While it is necessary to call attention to mistakes (which everyone makes), recognition of mistakes alone will decrease a person's desire to achieve. It is good to give the deserved compliments first after inspecting a job. Then follow this with constructive criticism, if needed.	17
Satisfying Needs	Explain that most people want to contribute to the success of the unit and organization, but they generally need a boost or reward, however slight, for doing a good job. This is not selfish but rather, it is human nature and a factor that a leader must consider.	18
Increasing Motivation	<p>Explain that punishment by the leader is sometimes necessary. This may include putting a subordinate on report, reprimanding him or her, or advising the individual that he or she will not be recommended for advancement unless he or she shows an improvement in attitude and results.</p> <p>Explain that while punishment may make people do what they should, it alone cannot motivate, because motivation is an inner force. The motivated person is self-starting and self-controlled. He or she does what is necessary to get the job done by him or herself. What are the things that make people want to do a better job? Many surveys have been done over the years to try to determine these things. In the civilian business world, such matters directly affect production, relationships with unions, public goodwill, and profits. In the Navy, these things directly affect morale, readiness, and reenlistments.</p>	19-20
Check on Learning Questions A(Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	21
Increasing Motivation	<p>Explain that such surveys have found that there are nine main motivating factors. In order of importance, these motivating factors are</p> <ol style="list-style-type: none"> 1. Feeling that one's work is important 2. Opportunity to do interesting work 3. Opportunity for self-development and improvement 4. Good pay 5. Chance for advancement 6. Respect as an individual 7. Chance to produce work of high quality 8. Knowing what is going on in the organization 9. High degree of freedom on the job 	22
Increasing Motivation	<p>Explain that items most often put at the bottom of any such listing are the threat of disciplinary action, not having to work too hard, and working under close supervision. Note that each of these is negative, whereas the nine above are all positive.</p> <p>Explain that to help motivate workers a leader must give each one the chance to develop his or her abilities and talents. He or she must allow them to use their initiative and judgment within the constraints the leader sets up.</p>	23

Chapter 3 / Section 1: NS2-M2C3S1 – Leadership Skills

Morale	Explain that high morale is the result of effective leadership. No direction of human activity is possible without it, and no failure is final until morale is destroyed. Morale is based on the belief of the leader in the follower, of the follower in the leader, of each in themselves, and of both in the cause.	24
Morale	What is morale, since it is so important? Explain that morale is the state of mind of an individual. Living conditions, food, quarters, discipline, pay, and duties all affect morale. How important a person feels in a group plays a big part in how good or how bad his or her morale is. Everything that makes a person feel well and satisfied builds up morale, and everything that bothers him or her lowers morale.	25
Morale	Explain that to have high morale, an individual must first have standards and goals that make daily life meaningful. Second, he or she must know what must be completed or solved in order to reach those goals; there must be satisfying rewards. Third, a person's basic goals must be in line with other members of the group, so that his or her morale can be kept high during periods of stress.	26
Morale	Explain that the leader must realize that high morale is present only in groups that are disciplined and efficient. Morale can be measured by inspections of personnel and their equipment. Interviews can help determine if morale is high or low. A key fact to remember about morale: nothing will destroy it so surely as inactivity and boredom. At the same time, relaxation and freedom are essential. The leader must plan a schedule with a proper mix of work and play to keep up morale.	27-28
Building Morale	<p>Explain that the following are some general rules for building high morale in a unit. A leader should;</p> <ol style="list-style-type: none"> 1. Make people confident in his or her ability. 2. Stay in touch with individuals' problems and wishes. 3. Be consistent and fair in assigning duties and in giving rewards and punishments. 4. Show people that he or she respects them and is proud to be with them. 5. Keep well informed of attitudes. 6. Be accessible. 7. Participate in planning and carrying out unit activities. 8. Actively supervise lower-ranking leaders to be sure that they do their jobs with the unit's welfare in mind. 9. See that people have plenty of opportunity for further education. 10. Always be friendly, courteous, and tactful. 11. Know each individual by name. 	29-31
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	32
Conversation and Leadership	<p>Explain that it is "good business" for a leader to stay in touch with each of his or her subordinates. Personal contact with his or her people is one of a leader's most effective ways of letting them know they are important. This will result in higher morale and will greatly contribute to the efficiency of the command.</p> <p>Explain that a leader must believe that each person has something of value to say, that the person may know something the leader doesn't know. Both will benefit from the friendly exchange.</p>	33

Chapter 3 / Section 1: NS2-M2C3S1 – Leadership Skills

Conversation and Leadership	<p>Explain that a leader should begin a conversation with a subject of interest to the subordinate. Unit activities, school athletics, clubs, or other programs can be good subjects for “breaking the ice.” One does not walk up to subordinates or casual acquaintances and suddenly ask about their health, financial status, details about the family, or hobbies.</p> <p>Explain that a leader should remember three things when starting a conversation. First, no one wants their private affairs pried into. Second, many people like to talk about themselves to someone they can trust, who will listen and understand. And third, the key to getting acquainted is a sincere and unselfish interest in the people being approached. Probably the best opening subject is their work. This is not only of interest to the person but also of genuine interest to the leader.</p>	34
Conversation and Leadership	<p>Explain that the following are some conversation starters that may be helpful.</p> <ul style="list-style-type: none"> • A question about what they are doing or planning to do • A comment on their skill or speed in doing the work • A suggestion for improvement, if this seems needed • An explanation of the importance of the work • A question about how the activity can be improved • A remark regarding similar activities • A question about their earlier experience with similar work 	35
Conversation and Leadership	<p>Explain that any of these starting points can lead into other topics, if the leader is sincerely interested in getting acquainted and will listen well.</p>	36
Conversation and Leadership	<p>Explain that listening is a skill the effective leader must have. Few things make a person feel so important or so good about themselves as really being listened to by someone they admire or respect. It takes willpower and practice to forget about personal problems, or other concerns, when trying to listen to someone. It simply is not possible to listen to a person while thinking about something else. Thinking about other things is bound to show through even if you try to follow the person’s story with smiles, frowns, and other signs.</p>	37-38
Conversation and Leadership	<p>Explain that everyone can become a good listener. These are some hints that should help.</p> <ul style="list-style-type: none"> • Stop working when someone is talking to you; not to do so can be considered insulting and is a sure way of ruining a conversation. • Accept the speaker as a fellow human being with an interesting personality. While the courtesies of rank should be observed, the speaker must be respected as an individual who has something to contribute. • Do not interrupt continually with insignificant corrections or arguments. • Do not belittle the speaker’s experiences, plans, accomplishments, or possessions with greater ones of your own. • Probably one of the worst things a listener can do is to tell other people what they mean, or to anticipate the point of their story when they have scarcely begun. This is not only discourteous, but it can also keep one from getting the vital facts. Give the speaker a chance, even if you know what he or she is driving at. 	39-40
Conversation and Leadership	<p>Explain that ending a conversation is almost as important as starting or keeping one going. The leader should not abruptly end a conversation that he or she has started. Ending a conversation without damaging the pride or feelings of the other fellow is an art every leader should develop.</p>	41

Chapter 3 / Section 1: NS2-M2C3S1 – Leadership Skills

Conversation and Leadership	<p>Explain that consideration and good listening are the keys to this art.</p> <p>Explain that once a leader becomes known for being willing to listen, having an open mind, a good memory, and the ability to grasp the point and settle problems, the person who may be inclined to talk too much will shorten his or her chatter. Others, grateful for the attention they know they will get, will respect the leader’s time, make their pitch, and depart.</p> <p>Explain that attentive, patient, open-minded listening is one of the biggest skills in leadership.</p>	42-43
Conclusions about Leadership	Explain that this sounds like a monumental task for anyone. But leadership, like any other skill, is learned with patient study and practice. The NJROTC cadet leader must keep in mind that promotion depends heavily upon the effort and preparation he or she puts into each task assigned.	44
Conclusions about Leadership	<p>Explain that to be a leader, then, one must do many things. Among these, the leader must</p> <ul style="list-style-type: none"> • Understand, guide, and teach. • Manage, administer, and supervise. • Have a dedication and sense of responsibility that inspire others. • Set a good example at all times. • Know people’s needs and understand how these needs affect human behavior. • Know how to deal with people and how best to use resources. • Listen effectively and give counsel wisely. • Plan ahead. 	45-46
Review Question	The Review Question is, “Explain which leadership style discussed in this chapter would work best in your NJROTC unit, in your opinion.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	47
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	48
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	49

Chapter 3 / Section 1: NS2-M2C3S1 – Leadership Skills

III. Supplemental Activities -

A. In Class Activity

Supplies required: White board or MOBI; handout for take home activity

When: This is a good activity to do at the beginning of the lesson.

- With the class: Develop a list of items that the cadets think are key to a successful NJROTC unit. The list should include items that provide motivation for the cadets along with expectations for what the program will do for them.
- Class question: Are there other opportunities that the program provides? What are some long term benefits of the program for you? Most of you are returning cadets. Is the course meeting your expectations? How are you, the cadet affecting the unit and its success?

B. Take Home Activity: In Naval Science 1, you learned the importance of being a good follower. Now, in Naval Science 2, we looked at the important traits and skills that make a good leader. Using the handout “Leadership Skills”, write an essay on the differences in being a good leader verses begin a good follower. You should reference leadership traits and skills that you have learned in this lesson.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 3 / Section 1: NS2-M2C3S1 – Leadership Skills

Activity 1: Take Home Activity- Leadership Skills

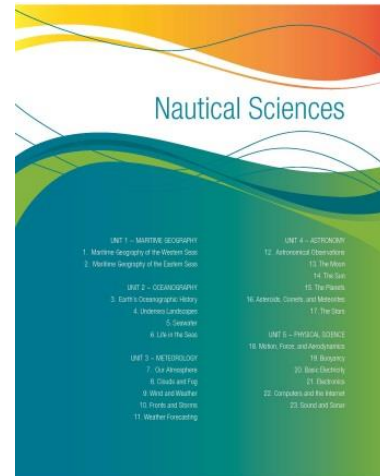
Name: _____ Date: _____ Class: _____

Directions: In Naval Science 1, you learned the importance of being a good follower. Now, in Naval Science 2, we looked at the important traits and skills that make a good leader. Write an essay on the differences in being a good leader verses begin a good follower. You should reference leadership traits and skills that you have learned in this lesson.

MODULE 3: Nautical Science

Module Overview**Module Objective:**

In this module you will develop a sound understanding of maritime geography as it relates to our national resources, landforms, climate, soil, bodies of water, people, governments, military, and geopolitics.

**Module Organization:**

Chapter Number	Chapter Name	Instructional Section / PowerPoint
1	Maritime Geography of the Western Seas	NS2-M3C1S1 – Maritime Geography of the Atlantic Ocean
		NS2-M3C1S2 – Caribbean Sea and Gulf of Mexico
		NS2-M3C1S3 – Mediterranean Sea and Black Sea
2	Maritime Geography of the Eastern Seas	NS2-M3C2S1 – The Middle East
		NS2-M3C2S2 – Indian Ocean
		NS2-M3C2S3 – Pacific Ocean
3	Earth's Oceanographic History	NS2-M3C3S1 – Earth's Oceanographic History
4	Undersea Landscapes	NS2-M3C4S1 – Undersea Landscapes
5	Seawater: Its Makeup and Movements	NS2-M3C5S1 – The Makeup of Seawater
		NS2-M3C5S2 - Waves
		NS2-M3C5S3 – Ocean Currents and Gyres
6	Life in the Seas	NS2-M3C6S1 – Simple Life in the Seas

		NS2-M3C6S2 – Marine Animals
		NS2-M3C6S3 – Life in the Open Sea
		NS2-M3C6S4 - Bioluminescence
		NS2-M3C6S5 – Underwater Research
7	Our Atmosphere	NS2-M3C7S1 – The Earth’s Atmosphere
		NS2-M3C7S2 – Atmospheric Pressure
8	Clouds and Fog	NS2-M3C8S1 – Clouds and Fog
9	Wind and Weather	NS2-M3C9S1 – Wind and Weather
10	Fronts and Storms	NS2-M3C10S1 – Frontal Weather
		NS2-M3C10S2 - Tornadoes
11	Weather Forecasting	NS2-M3C11S1 – Weather Forecasting
12	Astronomical Observation	NS2-M3C12S1 – Telescopes
		NS2-M3C12S2 – The Radiotelescope
		NS2-M3C12S3 – Satellites and Exploratory Spacecraft
13	The Moon	NS2-M3C13S1 – The Moon
14	The Sun	NS2-M3C14S1 – The Sun
15	The Planets	NS2-M3C15S1 – Planets Overview, Mercury & Venus
		NS2-M3C15S2 – Mars and Jupiter
		NS2-M3C15S3 – Saturn, Uranus, Neptune & Dwarf Planets
16	Asteroids, Comets and Meteors	NS2-M3C16S1 – Asteroids, Comets, and Meteors
17	The Stars	NS2-M3C17S1 – The Stars
18	Motion, Force, and Aerodynamics	NS2-M3C18S1 – Motion, Force, and Aerodynamics
19	Buoyancy	NS2-M3C19S1 – Buoyancy
20	Basic Electricity	NS2-M3C20S1 – What is Electricity?
		NS2-M3C20S2 - Current
21	Electronics	NS2-M3C21S1 – Electromagnetic Waves
		NS2-M3C21S2 – Radio Applications
22	Computers and the Internet	NS2-M3C22S1 – Computers and the Internet
23	Sound and Sonar	NS2-M3C23S1 – The Essence of Sound
		NS2-M3C23S2 – The Doppler Shift

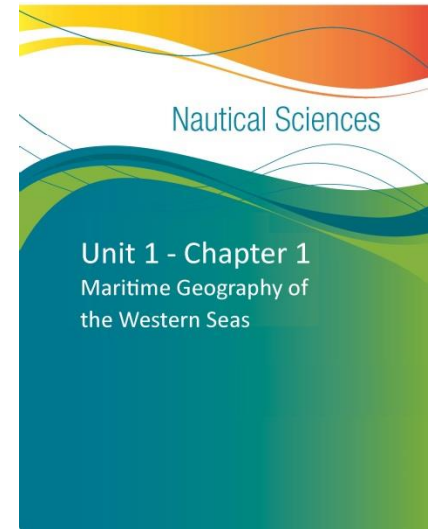
Module 3 Chapter 1: NS2-M3C1 – Maritime Geography of the Western Seas

What Students Will Learn to Do:

Illustrate an understanding of maritime geography as it relates to our national resources, landforms, climate, soil, bodies of water, people, governments, military and geopolitics

Skills and Knowledge to be Gained:

1. Explain three important reasons for study of geography
2. Describe the subdivisions of the World Ocean
3. Cite the importance of geography in military planning and operations
4. Describe the Atlantic Ocean in terms of its economic and strategic importance to the United States and its allies
5. Describe the importance of the Caribbean Sea and the Gulf of Mexico to the United States and its allies
6. Describe the Arctic Ocean in terms of its economic and strategic importance to the United States and its allies
7. Describe the Mediterranean Sea in terms of its economic and strategic importance to the United States and its allies



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...
- RI.9-10.8. Delineate and evaluate the argument and specific claims in a text...

Writing

- W.9-10.1. Write arguments to support claims in an analysis of substantive topics or texts...
- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically...
- SL.9-10.5. Make strategic use of digital...

Module 3 Chapter 1: NS2-M3C1 – Maritime Geography of the Western Seas

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Civic and Political Institutions

- D2.Civ.3.9-12. Analyze the impact of constitutions, laws, treaties, and international agreements on the maintenance of national and international order.

Dimension 2. Geography

- D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them.
- D2.Geo.5.9-12. Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.
- D2.Geo.12.9-12. Evaluate the consequences of human-made and natural catastrophes on global trade, politics, and human migration.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...
- D2.His.3.9-12. Use questions generated about individuals and groups to assess how the significance of their actions changes over time and is shaped by the historical context.

Dimension 4. Communicating Conclusions and Taking Informed Action

- D4.2.9-12. Construct explanations using sound reasoning, correct sequence, examples, and details with significant and pertinent information and data...
- D4.3.9-12. Present adaptations of arguments and explanations that feature evocative ideas and perspectives on issues and topics...
- D4.4.9-12. Critique the use of claims and evidence in arguments for credibility.

Next Generation Science Standards (NGSS)

HS.Human Sustainability

- HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

Module 3 Chapter 1: NS2-M3C1 – Maritime Geography of the Western Seas

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the [Naval Science 2 Instructor's Guide](#).

Chapter 1 / Section 1: NS2-M3C1S1 – Maritime Geography of the Atlantic Ocean

(Section 1 of 3)

What Students Will Learn to Do:

Illustrate an understanding of maritime geography as it relates to our national resources, landforms, climate, soil, and bodies of water, people, governments, military and geopolitics

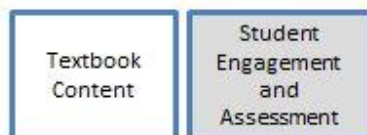
Skills and Knowledge to be Gained:

1. Explain three important reasons for study of geography
2. Describe the subdivisions of the World Ocean
3. Cite the importance of geography in military planning and operations
4. Describe the Atlantic Ocean in terms of its economic and strategic importance to the United States and its allies

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 1. Place a checkmark beside the NS2-M3C1S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C1S1 - Key Terms and NS2-M3C1S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 1 / Section 1: NS2-M3C1S1 – Maritime Geography of the Atlantic Ocean

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Unit Overview	Explain that although Geography is the study of where things are on the Earth, it is also more than that. It is about the relationship of things in a given area—natural resources, land, climate, economics, people, and governments. For Naval science students, an important part of geography has to do with the location of key places of maritime significance, the waters around them, and the transportation routes between them, by both land and sea. Also, of particular interest are the relationships between geography and politics, called geopolitics, and a related field of study called military geography.	1-4
Unit Overview	Explain that geography has been considered an important subject for study since ancient times. Knowledge of geography is needed if you want to be a good citizen of your country and of the world. Only by knowing your own country will you be aware of its strengths and needs. Geography helps supply such knowledge. Not all nations are blessed with great resources as is the United States. However, the U.S needs the resources other countries can provide in order to maintain the existing standard of living.	5-6
Unit Overview	Explain that we also must be aware of the dangers posed by possible enemies. Our nation wishes to maintain its independence and security. It is clear that some other nations do not have such good intentions. They seek to change governments and bring nations under their control and in most cases, their objectives are not only political and social. Their actions are geared to world geography. They want to control the world from geographic strong points so they can spread their economic, political, and military control across the globe. All U.S. citizens should understand these geopolitical goals.	7
Unit Overview	Explain that understanding geography requires the use of maps. In geography, a map is the most basic tool. In this unit you will learn where important countries and places are located and you will learn about the oceans and seas around these places. To assist in the correct pronunciation of place names, the more difficult ones in the following two chapters are followed by syllabic pronunciation guides.	8
Unit Overview	Explain that the world ocean is the political, economic, and military lifeblood of much of the world. It carries raw materials, food, and manufactured products throughout the world. It provides the people of the world protein-rich seafood. The world ocean is also becoming an important source of minerals.	9-10
Unit Overview	Explain that the continents are large islands in this vast ocean. They divide the world ocean into six major ocean basins. An ocean basin is a hollow or depression in the Earth's surface containing water. There are six major ocean basins. The six ocean basins, listed in order of size, are the South Pacific, North Pacific, Indian, North Atlantic, South Atlantic, and Arctic.	11
Unit Overview	Explain that smaller, partially enclosed subdivisions of the oceans are called seas. There are many "seas" that are really only part of these oceans. Some of the more important from the standpoint of location and natural resources are the Mediterranean Sea, Caribbean Sea, North Sea, Baltic Sea, Black Sea, Red Sea, Arabian Sea, South China Sea, Sea of Japan, Barents Sea, and Bering Sea. There are a number of important gulfs, or pockets of the seas that reach into the continents. Most notable of these are the Gulf of Mexico, the Persian Gulf, and the Gulf of Aden. You should be able to locate all of these on a world map or a globe.	12-13

Chapter 1 / Section 1: NS2-M3C1S1 – Maritime Geography of the Atlantic Ocean

Unit Overview	Explain that only in the last hundred years or so have the scientific instruments been available for making accurate charts and maps of the ocean floor. These show that the ocean floor is just as varied as the land surfaces. Submarine (underwater) geography shows deep sea ridges similar to mountain ranges, sea mounts similar to mountain peaks on land, basins and plains much like valleys and surface plains on land, and great trenches even deeper than the Grand Canyon.	14-15
Unit Overview	Explain that on the edges of the oceans are the world's seaports and Naval bases from which ships sail forth. Seaports are harbors, towns, or cities having access to the sea, and containing facilities for cargo handling and ship maintenance of all kinds. A Naval base may or may not be located at a seaport. A Naval base has facilities for sustaining Naval warships and auxiliary vessels. The routes these ships travel are the strategic waterways of the world.	16
Unit Overview	Explain that from ancient days until World War II, military geography was largely a matter of opposing armies finding places to fortify and defend. It might have also involved finding terrain that would be helpful in fighting the battle—hills, rivers, forests, and so on. At sea, the ancients looked for sheltered coves or the leeward side (side away from the wind) of islands where seas were calm. Here, their oarsmen might be more effective in ramming enemy vessels. Narrow channels with shoals made defense easier for those familiar with the area.	17
Unit Overview	Explain that in World War I, military geography began to be studied. By World War II, every aspect of geography became important in military planning. Global warfare had begun forcing planners to think about fighting and supporting armies in deserts, jungles, polar regions, mountains, and islands around the world. Supply lines, routes of communications, and transport became crucial. Manmade features such as cities, roads, railroads, bridges, airfields, and harbors often decided success or failure. In the Korean and Vietnam Wars the geopolitical effects were worldwide. The same is true of the turmoil in the less-developed nations of Africa, Asia, and Central America since then.	18-21
Unit Overview	Explain that raw materials, transportation, and distance have become crucial to victory in war and to national survival. We depend on foreign bases and alliances.	22
Unit Overview	Explain that today, as in World War II, every aspect of world geography is taken into account by military planners. Because we depend on foreign sources for many natural resources as well as overseas bases and alliances, the maritime aspects of military geography are very important. Sea communications routes, through geographic choke points such as straits, island groups, and canals, are more important than ever before.	23
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will begin our study of maritime geography. Geography is the study of the features of the Earth and its effects on man and animals. Since approximately 75 percent of our world is covered by water, it should be clear that the seas are important to life on the Earth.</p> <p>We will describe maritime geography as it relates to our national resources, landforms, climate, soil, bodies of water, people, governments, military, and geopolitics.</p>	24-26
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	27
Key terms - Definitions	Reinforce the correct definition for each key term.	28-30

Chapter 1 / Section 1: NS2-M3C1S1 – Maritime Geography of the Atlantic Ocean

Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “What would be the consequences of modern-day U.S. shipping ports being blockaded?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the introduction to maritime geography of the western seas.	31
Warm-Up Questions(Lesson questions 1-2)	Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions. Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.	32
Introduction	Explain that the sea-lanes of the Atlantic are the most traveled in the world ocean. The main shipping lanes go between the East Coast of the United States and Western Europe, the two most industrialized regions of the world. The heaviest bulk cargo traffic is carried in huge tankers between the Persian Gulf-area oil fields and Western Europe, traveling the long route around the Cape of Good Hope in South Africa. (The jumbo tankers are too large to go through the Suez Canal, the route taken by smaller tankers and general cargo ships on their way to both U.S. and European ports from Asia.) The United States imports a large percentage of its total oil needs, and much of that comes across Atlantic sea-lanes—from the Persian Gulf, Venezuela, and Nigeria.	33-36
Introduction	Explain that the most important military sea-lanes are those between the United States and its Western European NATO (North Atlantic Treaty Organization) allies, and those to the oil countries of the Middle East. The North Atlantic sea-lanes are the only way aid could be delivered from North America to Western Europe in time of war. The United States, on the other hand, is greatly dependent on oil from the Middle East and strategic minerals from Africa and South America. The U.S. also needs European, South American, and African markets for products and agricultural produce originating from the United States.	37-38
The Atlantic Ocean	Explain that the Atlantic Ocean consists of two basins roughly separated by an underwater mountain range called the Mid-Atlantic Ridge. The western basin lies between North and South America, and the eastern basin is between Europe and Africa. The total ocean has an area of about 31,660,000 square miles. Its average depth is about 10,930 feet. The deepest spot in the North Atlantic is in the Puerto Rico Trench, 28,374 feet deep. In the South Atlantic, it is the South Sandwich Trench, 27,113 feet deep, about 400 miles east of South Georgia Island, off the coast of Argentina. The mid-ocean floor is dominated by the Mid-Atlantic Ridge. Only a few islands emerge above sea level along the ridge, most of which crest one to two miles beneath the surface. These islands are Iceland and the Azores in the North Atlantic, and Ascension Island and Tristan da Cunha in the South Atlantic.	39-42
Check on Learning Questions A (Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	43

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The Atlantic Ocean	Explain that few mineral deposits in the Atlantic Ocean's floor can be worked profitably at this time. Those that are mined are located in the shallow waters of the continental shelves (the extension of the continents out to a water depth of 600 feet). The largest mining operations in the Atlantic are for sands and gravels along the Atlantic seaboard of the United States.	44
The Atlantic Ocean	Explain that the largest single offshore mining operation in the world is based on Ocean Cay in the Bahamas. Aragonite sands, composed mostly of calcium carbonate, are dredged up. They are used in the manufacture of cement, glass, and animal feed supplements. A cement industry also is operated in Iceland, based on shell-sands. Phosphates for fertilizers are mined in a number of spots along the shores of all continents facing the Atlantic.	45-47
The Atlantic Ocean	Explain that the most important mining operations in the Atlantic are the oil wells in the Gulf of Mexico off the coasts of Texas, Louisiana, and Mexico. Also, there is much oil production in the North Sea between Great Britain and Norway.	48-49
The Atlantic Ocean	Explain that the North Atlantic has been the scene of major commercial fishing for more than a thousand years. On both sides of the ocean there are major fisheries. Cod, haddock, flounder, and ocean perch are found in the Grand Banks off the Canadian province of Newfoundland and the northeast coast of the United States. Lobsters are a high-value harvest from the New England coast, the Caribbean, Brazil, and South Africa. The Atlantic has some of the most heavily fished waters in the world.	50-51
The Atlantic Ocean	Explain that the major U.S. Atlantic ports are Boston, New York, Baltimore, Norfolk, and Charleston. There are many other ports of lesser importance from the standpoint of annual volume. These ports, however, are also very important to coastal shipping and the general prosperity of the nation.	52-54
The Atlantic Ocean	Explain that on the eastern side of the Atlantic, the U.S. Navy maintains an important naval air station at Keflavik, Iceland, and a much-used naval base at Rota, Spain. The major ports of Britain are Liverpool, London, and Southampton.	55-56
The Atlantic Ocean	Explain that the largest and busiest Atlantic port of Western Europe is Antwerp, Belgium. Other important Western European ports are Rotterdam, Holland; Bremerhaven and Hamburg, Germany; Le Havre, France; Copenhagen, Denmark; Oslo, Norway; and Lisbon, Portugal. Almost all direct support for U.S. forces in Germany comes through Antwerp or Bremerhaven. You should know the location of these ports. They all figure prominently in U.S. trade, and all are vital to the defense and economies of Western Europe.	57-58
The Atlantic Ocean	Explain that on the western side of the South Atlantic are some important South American ports. A large amount of bauxite ore for making aluminum is exported from Georgetown, Guyana, to the United States and other industrialized nations. Tropical woods, quinine, and natural rubber are exported from Belém, near the mouth of the Amazon River in Brazil.	59-60
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	61
The Atlantic Ocean	The great Brazilian cities of Rio de Janeiro and São Paulo-Santos export iron ore and import U.S. and European manufactured products used in Brazil. Buenos Aires, Argentina, and Montevideo, Uruguay export beef to the United States and export beef and wheat to Europe. They also import manufactured products from the United States and Europe.	62-63

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The Atlantic Ocean	Explain that west African ports of special trading interest to the United States include Casablanca, Morocco, for lead and cobalt; Monrovia, Liberia, for iron ore; Lagos, Nigeria, for oil; Accra, Ghana, for cocoa and gold; and Cape Town, South Africa, for strategic minerals including gold, diamonds, platinum, and chromium.	64-65
The Atlantic Ocean	Explain that when we use the word ‘strategic’ with geography, we are referring to areas on Earth’s surface that are important from a military standpoint. The Atlantic side of the European coast has a number of strategic waterways. The two most important of these are the Strait of Gibraltar and the Danish straits Skagerrak (Sk’ag’-e-r’ak) and Kattegat (Kät’-e-gät).	66
The Atlantic Ocean	Explain that the Strait of Gibraltar is the western entrance to the Mediterranean Sea. It also is the door to the Atlantic Ocean for Russian Black Sea and Mediterranean Squadron Naval vessels. Under control of Britain, Gibraltar is also vital to allied interests in southern Europe and North Africa.	67
The Atlantic Ocean	Explain that Russian Naval vessels from the Baltic Sea Fleet must go through the Danish straits to get into the North Sea and North Atlantic.	68
The Atlantic Ocean	Explain that the main Russian Naval bases and shipbuilding cities on the Baltic Sea are St. Petersburg and Kaliningrad (a seaport in the Russian Federation on the Bay of Danzig). Other important East European ports are Riga, Latvia. Also, the seaports in northern Poland of Gdynia and Gdansk located on the Gulf of Danzig.	69-70
The Atlantic Ocean	Explain that another strategic area from the standpoint of defending allied shipping in the North Atlantic is known as the Greenland-Iceland-United Kingdom (G-I-UK) gap. This is a wide expanse of water between Greenland, Iceland, the Faeroe Islands, and northern Scotland. A major objective of the United States and its NATO allies in the event of future war with any of the Russian states would be to try to keep their submarines out of the North Atlantic shipping lanes by blocking their passage through the Strait of Gibraltar and the G-I-UK gap.	71-72
The Atlantic Ocean	Explain that some of the most significant events in modern times—ones that have had profound and continuing effects on military strategy in northern Europe and throughout the world—were the democratization of the former Soviet satellite nations of Eastern Europe in the late 1980s, the reunification of Germany in 1990, and the fall of the Soviet Union in 1991. More on these events and their effects is presented in the history section of this text.	73-75
Review Question	The Review Question is, “Discuss why the G-I-UK Gap is strategically important from a military perspective.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	76
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	77
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	78

Chapter 1 / Section 1: NS2-M3C1S1 – Maritime Geography of the Atlantic Ocean

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handout - Atlantic Ocean T-Chart

When: The In-Class Activity can be started prior to the lesson and completed during the lesson.

- In-Class: Cadets will make a T-Chart and fill it in as they go through the lesson. They will use the T-Chart to do the at-home activity.

B. Take Home Activity: Divide Cadets into 2 groups; Economic and Strategic. Using the T-charts they made in the In-Class Activity, and based on the group they were put in, have the cadets complete a poster that advertises and illustrates the economic or strategic importance of the Atlantic Ocean. Posters should use both words and illustrations.



Tech Tip: Google has a great interactive site that explores the world's oceans.

<http://www.google.com/earth/explore/showcase/ocean.html#tab=underwater-terrain>

IV. Evaluation - see CPS database for chapter test questions.

Chapter 1 / Section 1: NS2-M3C1S1 – Maritime Geography of the Atlantic Ocean

Activity1: In Class Activity: Atlantic Ocean T-Chart

Name: _____ Date: _____ Class: _____

ATLANTIC OCEAN	
Economic Importance	Strategic Importance

Chapter 1 / Section 2: NS2-M3C1S2 – Caribbean Sea and Gulf of Mexico

(Section 2 of 3)

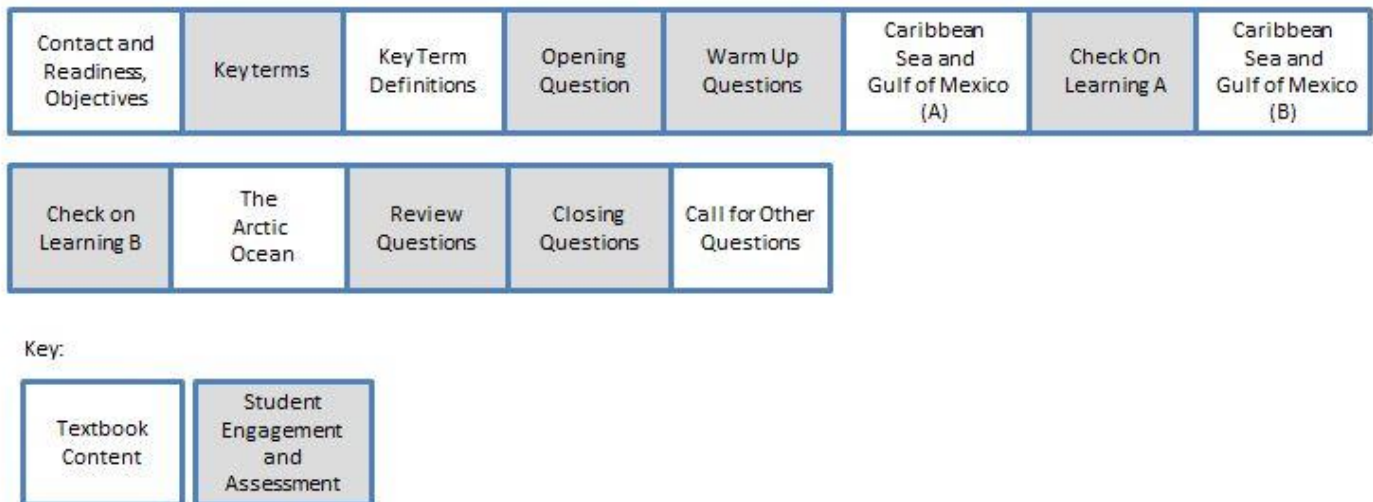
What Students Will Learn to Do:

Illustrate an understanding of maritime geography as it relates to our national resources, landforms, climate, soil, and bodies of water, people, governments, military and geopolitics

Skills and Knowledge to be Gained:

1. Describe the importance of the Caribbean Sea and the Gulf of Mexico to the United States and its allies
2. Describe the Arctic Ocean in terms of its economic and strategic importance to the United States and its allies

LESSON FLOW OUTLINE



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 1. Place a checkmark beside the NS2-M3C1S2 PowerPoint presentation, and these two CPS question deck files: NS2-M3C1S2 - Key Terms and NS2-M3C1S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 1 / Section 2: NS2-M3C1S2 – Caribbean Sea and Gulf of Mexico

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons. In this lesson we will discuss the western seas and their importance. We will talk about the subdivisions of the world oceans; the importance of the Caribbean Sea, Gulf of Mexico, and Arctic Ocean in terms of their economic and strategic value to the U.S. and its allies.	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-6
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Review what you already learned about the Panama Canal.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on Caribbean Sea and Gulf of Mexico.	7
Warm-Up Questions(Lesson questions 1-2)	Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions. Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.	8
Caribbean Sea and Gulf of Mexico	Explain that the Caribbean has an area of 1,020,000 square miles, with two deep basins separated by the underwater Nicaragua Rise. The rise runs from the hump of Honduras and Nicaragua in Central America northeastward past Jamaica to Haiti. This shallow rise, only 200 to 1,000 feet deep, takes up almost one-fourth of the Caribbean Sea area. Located to the north is the Yucatán basin with the Cayman Trench, the deepest part of the sea at 25,216 feet.	9-10
Caribbean Sea and Gulf of Mexico	Explain that the Lesser Antilles, small islands bordering the eastern limits of the Caribbean, are on a ridge of very active volcanoes. Mount Pelée, on the island of Martinique, killed 30,000 people during a violent volcanic eruption in 1902. There was a similar volcanic eruption on the island of Guadeloupe in 1976.	11-12
Caribbean Sea and Gulf of Mexico	Explain that currents from the equatorial Atlantic flow into the Caribbean from the southeast along the coast of northern South America. Part of this current continues north into the Gulf of Mexico before moving eastward again between Cuba and Florida, and then up the East Coast of the United States. The prevailing winds, which to a large extent follow the currents, bring strong hurricanes into the area and up the East Coast in the late summer and fall of the year. Almost every year these huge storms cause great property damage and loss of life somewhere in the Caribbean Islands, on the Gulf Coast, or along the eastern seaboard of the United States. An example of these destructive storms is Hurricane Katrina.	13

Chapter 1 / Section 2: NS2-M3C1S2 – Caribbean Sea and Gulf of Mexico

Caribbean Sea and Gulf of Mexico	Explain that the Gulf of Mexico has an area of 598,000 square miles and an average depth of 4,960 feet. From the Yucatán Peninsula of Mexico in the south, around the gulf clockwise to the southern tip of Florida, the continental shelf extends far to sea. In the north it has been broadened even farther by silt carried out to sea by the Mississippi River.	14
Caribbean Sea and Gulf of Mexico	Explain that the Caribbean Sea in general has fewer mineral resources than other ocean basins. The exception to this are the Venezuelan oil fields on Lake Maracaibo (Mär-ä-ki'-bo). This offshore drilling operation places Venezuela as the world's fifth largest producer of petroleum. Venezuela is one of the top exporters of oil to the United States.	15-16
Caribbean Sea and Gulf of Mexico	Explain that the Gulf Coast of Louisiana and Texas is also rich in oil produced from offshore rigs. Oil and natural gas fields are also being developed along the Mexican coast near Tampico. One of the worst oil-pollution catastrophes to date occurred in the Mexican field in 1979–80 when an underwater well exploded. Millions of barrels of oil escaped into the gulf, spreading an oil slick miles away to Texas beaches.	17-19
Caribbean Sea and Gulf of Mexico	Explain that a great deal of fishing is done by the people of the many Caribbean islands. Most of this is small scale fishing, that is, catches are brought ashore and consumed fresh. The most important commercial fishing operations are for shrimp and menhaden in the Gulf of Mexico. There is a large shrimp catch along the U.S. and Mexican Gulf Coasts. This is where the majority of the shrimp consumed in the United States is caught.	20
Caribbean Sea and Gulf of Mexico	Explain that menhaden fishing is the most mechanized in the fishing industry. Small boats pump their catch into larger carrier vessels. The fish are then brought ashore and processed into fish meal for export, mostly to less developed countries. Fish meal is a high-protein product used for fish cakes, seafood sauces, and other similar foods.	21
Caribbean Sea and Gulf of Mexico	Explain that there are also large numbers of delicious Caribbean lobsters, called <i>langusta</i> , caught around all the islands. Some are frozen into packages of expensive lobster tails. <i>Langusta</i> differ from Maine lobsters only in that they do not have large claws. Excellent blue crabs are also caught along the U.S. Gulf Coast. Some are used for canning but most for the fresh market.	22
Caribbean Sea and Gulf of Mexico	Explain that Houston, Texas, and New Orleans, Louisiana, are the major U.S. ports on the Gulf Coast. Other important ports are Galveston and Port Arthur, Texas; Mobile, Alabama; and Tampa, Florida. Veracruz is the most important Mexican port. Barranquilla (Bär-räng-ke'-yā), a Seaport in northern Columbia on the Magdalena River and La Guaira, a sea port in northern Venezuela (port of Caracas), are important in their respective nations. The capital cities in the Greater and Lesser Antilles are the major ports of each of those islands. The largest and most important of these cities is Havana, Cuba. The island of Aruba, in the Netherlands Antilles not far from Lake Maracaibo, is a major oil-refining site. Much asphalt is exported from Port of Spain, Trinidad.	23--26
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	27
Caribbean Sea and Gulf of Mexico	Explain that the Antilles are a favorite area for luxury passenger cruise ships. To escape the winter, Americans cruise out of Port Everglades (Miami), Florida, and San Juan, Puerto Rico, on pleasure voyages to exotic Caribbean ports such as St. Thomas, Jamaica, and Barbados.	28

Chapter 1 / Section 2: NS2-M3C1S2 – Caribbean Sea and Gulf of Mexico

Caribbean Sea and Gulf of Mexico	Explain that the United States has no major Naval bases on the Gulf Coast. There is a large commercial shipyard that hosts major Naval shipbuilding programs located at Pascagoula, Mississippi. Along with other Naval air facilities in Corpus Christi, TX, Pensacola, FL has a major Air base complex. There is a major Naval air base complex at Pensacola, Florida, and there is an important U.S. Naval base in the Caribbean at Guantánamo Bay, Cuba.	29-31
Caribbean Sea and Gulf of Mexico	Explain that certainly, the most important strategic spot in the Caribbean is the Panama Canal. Splitting the Central American peninsula in the Republic of Panama, the canal is the main route for most ocean traffic between the Atlantic and Pacific. The Canal Zone was run by the United States for most of the last century, but it was returned by treaty to Panama in 1999.	32
Caribbean Sea and Gulf of Mexico	Explain that the Panama Canal has always been vital to U.S. interests. There is no question of its importance as a choke point of international trade. While the canal is probably not as important to U.S. defense as it once was, its loss to an enemy power would severely harm U.S. and Western Hemisphere security and economic interests.	33
Caribbean Sea and Gulf of Mexico	Explain that Cuba has been a major problem in the Caribbean for the United States for the past forty years. Under communist dictator Fidel Castro, Cuba became an ally of the former Soviet Union. Cuba has served as a base of operations for revolutionaries throughout the Caribbean and Latin America. There is a base to support submarines at Cienfuegos in southern Cuba. A large number of gunboats are based in various small ports around the island. A number of interior airfields base fighter squadrons that fly modern fighter and attack aircraft.	34-35
Caribbean Sea and Gulf of Mexico	Explain that for three decades prior to the demise of the Soviet Union, a constant stream of Soviet ships and aircraft supplied Soviet goods to Cuba. With the cargo came military equipment and advisers that made the Cuban armed forces one of the largest and best-equipped military forces in the Western Hemisphere. Cuban forces supported communist forces fighting in several African and Central American revolutions throughout the 1970s and 1980s.	36
Caribbean Sea and Gulf of Mexico	Explain that the United States broke diplomatic ties with Cuba in 1961 when Castro openly embraced communism and announced his alliance with the Soviet Union. A low-key relationship was resumed in 1977, but there have been no serious moves to reopen embassies or exchange ambassadors since.	37
Caribbean Sea and Gulf of Mexico	Explain that when diplomatic relations were severed, the United States made sure the treaty granting the United States a Naval base at Guantánamo Bay, in far southeastern Cuba, stayed in effect. "Gitmo," as Naval personnel call it, is the Navy's main training base for the U.S. Atlantic Fleet. It has a fine harbor and good facilities. Except for an occasional hurricane in the fall, the weather is excellent most of the year for all types of fleet training, including aircraft operations and missile firing. The U.S. Marines maintain a force at Gitmo for defense of the base and its facilities. There is also a large detention facility staffed by Army personnel that serves as a holding and interrogation facility for al-Qaeda, Taliban, and other detainees that have come under U.S. control during the war on terrorism.	38-40
Caribbean Sea and Gulf of Mexico	Explain that Cuba is only about 90 miles from Florida, and it is directly in the path of the major sea-lanes between the United States, Central America, northern South America, and the Panama Canal. This communist presence is a constant threat to the peace and security of the Caribbean area, and to the security of the southeastern United States.	41

Chapter 1 / Section 2: NS2-M3C1S2 – Caribbean Sea and Gulf of Mexico

Caribbean Sea and Gulf of Mexico	Explain that following the demise of the Soviet Union in the early 1990s, all Russian aid to Cuba ceased, throwing Cuba into a state of severe economic depression that has persisted to the present day. This has led several times in the past, most recently during the summer of 1994, to large-scale attempts by many Cubans at illegal immigration into the United States. During these incidents, several thousand Cuban refugees used makeshift watercraft of all imaginable descriptions to try to make it across the Straits of Florida to land in the southern part of that state. Most of the refugees were stopped and rescued from their often overcrowded and unseaworthy craft by U.S. Coast Guard and Navy ships and patrol boats. They were then taken to temporary camps at the Guantánamo Naval Base pending eventual return to Castro's Cuba.	42-43
Check on Learning Questions B (Lesson questions 5-6)	Check in n students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	44
The Arctic Ocean	Explain that the Arctic Ocean is the smallest of the major oceans. It has an area of 4,700,000 square miles with an average depth of 3,250 feet. The deepest part of the ocean is the Abyssal Plain running across the North Pole at a depth of 15,091 feet. The Arctic basin is divided by three major submarine ridges that separate four large undersea plains and a number of smaller plains.	45-47
The Arctic Ocean	Explain that the continental shelf north of Alaska, Canada, and Greenland extends about 50 to 125 miles from shore. However, the continental shelf north of Asia extends from 300 to 600 miles toward the pole. That portion of the Asiatic continental shelf under the Barents Sea north of Russia and Scandinavia extends more than 1,000 miles to sea, past Spitsbergen and Franz Josef Land.	48-49
The Arctic Ocean	Explain that much geologic exploration for minerals has been done there in the last few years. Large oil and natural gas deposits probably exist in the Laptev Sea north of Siberia. Explain that the continental shelf off Alaska has also been the scene of much oil drilling. Major oil discoveries were made in the late 1960s and early 1970s in Prudhoe Bay. The 800-mile trans-Alaska pipeline was completed in 1977 at a cost of \$8 billion. More than a million barrels of oil now flow south daily from Prudhoe Bay to Valdez, Alaska, where tankers take it on board for delivery to West Coast refineries.	50-52
The Arctic Ocean	Explain that in March 1989 the largest oil tanker spill in U.S. history occurred when one of these tankers, the 987-foot Exxon Valdez, carrying 1,260,000 barrels of crude oil taken on at Valdez, ran aground on a reef in the Gulf of Alaska approximately 25 miles south of that port. Ultimately, the resulting oil slick from 260,000 barrels lost in the mishap spread more than 470 miles into the gulf. Many formerly clean Alaskan beaches and tidal basins were covered with inches of black sludge. A two-year multimillion-dollar effort was mounted to try to clean up the worst of the spill, but the accident nevertheless killed more than 10 percent of the area's bird population, along with thousands of sea otters and seals. The cause of the accident was later determined to be incompetent navigation by the tanker's Captain and crew.	53-54
The Arctic Ocean	Explain that large oil deposits have also been found in the continental shelf off the Beaufort Sea coast of Canada, some 400 miles east of Prudhoe Bay. Large natural gas deposits are now being tapped in the area of Melville Island in the Queen Elizabeth Islands.	55
The Arctic Ocean	Explain that getting oil out of the Arctic is a difficult task. The frigid cold, prolonged gale-force winds, and icing and freezing of lubricants and equipment make oil drilling extremely expensive and hazardous. The Arctic Ocean itself is almost always covered	56-57

Chapter 1 / Section 2: NS2-M3C1S2 – Caribbean Sea and Gulf of Mexico

	with constantly moving ice floes. Engineers have created artificial islands built from seabed sand and gravel dredged up during the brief summer melt, sometimes poured through holes cut in the 7-foot-thick ice.	
The Arctic Ocean	Explain that for much of the year and because of the extreme cold, the crude oil must be heated in order for it to flow satisfactorily through the pipelines and drilling rigs. But the demand for oil in the world is so great that no effort is spared to solve the problems.	58
The Arctic Ocean	Explain that only in the Barents and Norwegian Seas can commercial fishing take place. There, huge catches of cod, haddock, redfish, and halibut are made annually for the fresh-fish markets in Europe and in the former Soviet states. Annual catches average over 2 million tons. There is evidence of overfishing in these Arctic seas, so quotas have been set by the fishing nations. Some whaling is done in the area by a small Icelandic whaling fleet.	59-60
The Arctic Ocean	Explain that only Murmansk, Russia, and Narvik, Norway, are important ports in the Arctic. The former we have already identified as a Naval base for the Russian northern fleet. The latter is an important fishing port and a loading place for high-grade iron ore from Swedish mines at Kiruna, about 125 miles inland.	61
The Arctic Ocean	Explain that there are no significant commercial sea routes across the Arctic ice ocean at this time. In 1969, a specially built 150,000-ton icebreaker-tanker, the S.S. <i>Manhattan</i> , made a successful trip through the pack ice in the Northwest Passage. The route was from Davis Strait through Baffin Bay and Melville Sound to Prudhoe Bay and Barrow, Alaska. Though the route proved possible, the costs involved were so high the determination was made that pipelines are probably a more satisfactory way to move oil south from Alaska.	62-63
The Arctic Ocean	Explain that before its demise, every year since the 1950's, a Soviet surface force of icebreakers, Naval vessels, and merchant ships tried to transit the northern seas from the Atlantic to the Pacific. They were often successful, but it was always a great effort. The force resupplied many of the tiny settlements started by the Soviet government on the seacoasts	64
The Arctic Ocean	Explain that in 1958, the American nuclear submarine <i>U.S.S. Nautilus</i> became the first vessel ever to reach the North Pole under the ice. Since then, U.S., Soviet, and, more recently, Russian nuclear submarines have made many patrols under the ice. Engineers occasionally propose having submarine tankers cross the Arctic Ocean under the ice, cutting thousands of miles off the surface routes between U.S. and Canadian Beaufort Sea oil fields and northern Europe. Since the great circle routes across the Arctic are the shortest distance between Asia and the United States for both submarines and aircraft, the region would almost certainly be a major operational area in the event of war.	65-67
Review Question	The Review Question is, "List some of the significant events in modern times that have affected military strategy in northern Europe." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	68
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	69
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	70

Chapter 1 / Section 2: NS2-M3C1S2 – Caribbean Sea and Gulf of Mexico

III. Supplemental Activities -

A. In Class Activity:

Supplies required: the handout “How Well Do You Know the Arctic Ocean?”

When: The In-Class Activity can take place as an introductory activity to the lesson prior to the study of the Arctic Ocean.

- In-Class: Introduce the Arctic Ocean by copying and distributing the, “How Well Do You Know the Arctic Ocean?” activity. Cadets decide if each statement is True or False and a discussion of the correct answers can follow.
- Answers Key for handout:
 1. True
 2. True (Pack Ice, Polar Ice and Fast Ice)
 3. False. There is an abundance of fish in the Arctic Ocean.
 4. False. Even when the ice melts in places, there are icebergs in the ocean.
 5. False. There are several important ports and harbors.
 6. False. The Arctic Ocean provides resources such as oil, fish, and seals.
 7. True. Traversing the Arctic Ocean is very challenging and dangerous.
 8. True.
 9. True.
 10. False. In a time of war, the Arctic Ocean could provide a huge strategic advantage.

B. Take Home Activity: Using the supplied map and map key, have the cadets locate and place on the map the following:

- X= Oil Rich Areas
- O= Fishing
- P= Important ports
- != Cruise areas
- N=Strategic Naval Points and Bases
- /////= Panama Canal
- ***** = Alaska Pipeline

IV. Evaluation - see CPS database for chapter test questions.

Chapter 1 / Section 2: NS2-M3C1S2 – Caribbean Sea and Gulf of Mexico

Activity1: In Class Activity: How Well Do You Know the Arctic Ocean?

Name: _____ Date: _____ Class: _____

Directions: Next to each statement, decide if the statement is True or False.

- _____ 1. The Arctic Ocean is the smallest and shallowest of the five oceans.
- _____ 2. There are three kinds of ice in the Arctic Ocean.
- _____ 3. There are very few fish in the Arctic Ocean.
- _____ 4. During the summer months, all of the ice is gone from the Arctic Ocean.
- _____ 5. There are no important ports on the Arctic Ocean because of the climate.
- _____ 6. The Arctic Ocean provides very few natural resources.
- _____ 7. Icebergs in the Arctic Ocean provide challenges for ocean travel.
- _____ 8. The Arctic Ocean has the lowest average salinity of all of the world's oceans.
- _____ 9. Arctic means "the bear" in Greek.
- _____ 10. The Arctic Ocean provides no strategic importance to the United States.

Chapter 1 / Section 2: NS2-M3C1S2 – Caribbean Sea and Gulf of Mexico

Activity1: Take Home Activity: How Well Do You Know the Western Seas?

Name: _____ Date: _____ Class: _____



Chapter 1 / Section 3: NS2-M3C1S3 – Mediterranean Sea and Black Sea

(Section 3 of 3)

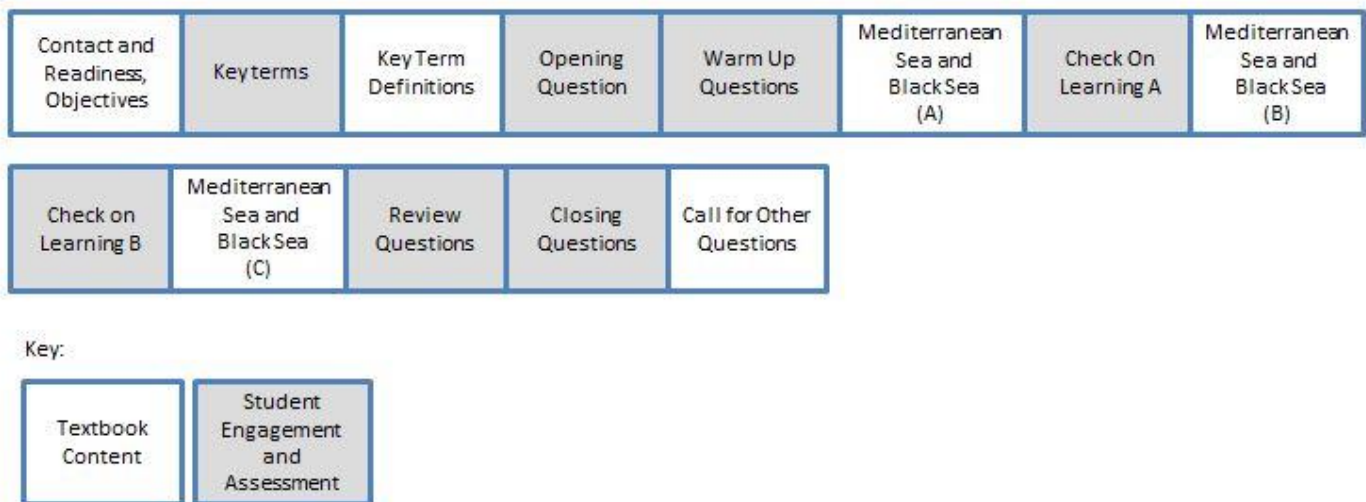
What Students Will Learn to Do:

Illustrate an understanding of maritime geography as it relates to our national resources, landforms, climate, soil, and bodies of water, people, governments, military and geopolitics

Skills and Knowledge to be Gained:

1. Describe the Mediterranean Sea in terms of its economic and strategic importance to the United States and its allies

LESSON FLOW OUTLINE



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, chapter 1. Place a checkmark beside the NS2-M3C1S3 PowerPoint presentation, and these two CPS question deck files: NS2-M3C1S3 - Key Terms and NS2-M3C1S3 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 1 / Section 3: NS2-M3C1S3 – Mediterranean Sea and Black Sea

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will discuss the Mediterranean Sea in terms of the economic and strategic value to the U.S. and its allies. We will discuss how maritime geography deals with the relationship between geography, politics (geopolitics) and military geography.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5
Opening Question(Random Pick a Student – “RPS”)	<p>This Opening Question is, “Why is it important to be environmentally responsible regarding offshore oil wells?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. The selected student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the Mediterranean Sea and the Black Sea.</p>	6
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	7
Mediterranean Sea and Black Sea	<p>Explain that the Mediterranean Sea is a long, shallow landlocked sea about 1,145,000 square miles in area. Its average depth is 4,921 feet, but there are several deep basins west and south of Italy. The word Mediterranean comes from the Latin words medius, meaning “middle,” and terra, meaning “land”; together they mean the sea “in the middle” of the lands (of Europe, Asia, and Africa). The Hellenic Trough, south of Greece, is the deepest area, more than 16,700 feet deep. The sea lies in a broad trench between the European and African continents. It stretches about 2,500 miles from the Strait of Gibraltar on the west to the country of Israel on the east.</p>	8-10
Mediterranean Sea and Black Sea	<p>Explain that the Mediterranean is divided into two basins, east and west of the Strait of Sicily. The continental shelves are very narrow around the Mediterranean, though most of the Adriatic Sea and Gulf of Gabes, off the coast of Tunisia, have sea floors that are actually continental shelves. Great sediment beds extend far to sea from the mouths of the Nile River in Egypt, Rhone River in France, and Ebro River in Spain.</p>	11-12
Mediterranean Sea and Black Sea	<p>Explain that the Mediterranean basin is one of the most active volcanic areas in the world. There are at least eleven active volcanoes in the Aegean Sea, in a belt from Athens to Rhodes. Four of these active volcanoes are islands, and the other volcanoes are submerged. Many more underwater volcanoes are in the western Mediterranean,</p>	13-14

Chapter 1 / Section 3: NS2-M3C1S3 – Mediterranean Sea and Black Sea

	to the north and west of Sicily, and around the Balearic Islands and Corsica. The whole Mediterranean area, especially Greece, Turkey, and Yugoslavia, often has large earthquakes. The pressures between the Eurasian and African geological plates exert pressure inward on the sea from both sides. Volcanic lava from the interior of the Earth wells up with huge pressure, causing volcanoes and earthquakes at the fault line where these plates meet.	
Mediterranean Sea and Black Sea	Explain that the Black Sea is located above Turkey on the eastern end of the Mediterranean, between Europe and Asia. It has an area of about 180,000 square miles, with maximum depths of slightly over 7,000 feet. It connects with the Mediterranean Sea through the Turkish straits and the Sea of Marmara. In many respects, it is a landlocked saltwater lake, whose mineral content has grown to the degree that it supports little life except in the surface layers. Some scientists have speculated that it was formed by an overflow from the Mediterranean Sea when, after the last ice age some 10,000 years ago, the ice melted. Its formation may have given rise to the story of the great flood in the Bible, and perhaps to the legend of the sinking of Atlantis. Recent photography of the bottom by remote-controlled submersibles has found evidence of ancient land-based habitation.	15-17
Mediterranean Sea and Black Sea	Explain that no readily accessible mineral deposits have been located in the Mediterranean. Far below the sediments on the sea floor, however, drillers have found large beds of rock salt, sulfur, potash, and gypsum. All would be valuable for the chemical and fertilizer industries. At the present time these minerals can be mined only from deposits on Sicily and other islands.	18
Mediterranean Sea and Black Sea	Explain that oil wells are being drilled off the shores of the Adriatic coast of Italy, in the Gulf of Gabes off Tunisia, and off the Nile delta in Egypt. Although geologic studies seem to indicate that there is oil and natural gas along much of the Mediterranean coastline, there is no equipment at present that can reach the depths necessary to reach the reserves.	19
Mediterranean Sea and Black Sea	Explain that the Mediterranean basin supports a fishing industry twice as valuable as that of any ocean. Catches bring high prices because most Mediterranean peoples consider fish a luxury food similar to steak. Thousands of fishing boats bring in small catches. Hake, sole, red mullet, and many other species of fish have a recorded catch in excess of a million tons each year. The total catch is probably much larger, since many local fishermen do not report an accurate number.	20
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	21
Mediterranean Sea and Black Sea	Explain that there is danger of large-scale pollution in the Mediterranean. This pollution threatens to destroy the balance of life in the sea. Overfishing is likewise making some kinds of fish scarce in some areas. The man-made pollution is worsened by the fact that this sea is almost totally landlocked. It loses by evaporation almost three times as much water as it gets from rainfall and runoff from land. Only the flow of water from the Atlantic keeps the sea at the same level over time. There is also a small flow from the Black Sea through the Turkish straits.	22-23
Mediterranean Sea and Black Sea	Explain that an example of humans' effect on the ecology of the eastern Mediterranean can be seen by looking at the changes that have taken place there since 1970. In that year, a high dam was completed across the Nile at Aswan, Egypt. This stopped the seasonal flood of fresh water and plant food into the sea by way of the Nile. Because of this, a fishing industry that had existed since the dawn of Western civilization near the mouth of the Nile has now almost disappeared.	24

Chapter 1 / Section 3: NS2-M3C1S3 – Mediterranean Sea and Black Sea

Mediterranean Sea and Black Sea	Explain that The Romans called the Mediterranean Sea the Mare Nostrum, which means “our sea.” The Mediterranean was the cradle of Western civilization and for nearly seven thousand years, there has been recorded history in the eastern Mediterranean. Egypt, Crete, Phoenicia, Greece, and finally Rome led the parade of culture and trade across the sea in ancient times.	25
Mediterranean Sea and Black Sea	Explain that during the Middle Ages, Christian and Muslim cultures clashed in the Crusades. The clash ended in what can be thought of as a geographic compromise: Christians settled to the north and west in Europe, and Muslims settled to the south and east in Africa and Asia.	26
Mediterranean Sea and Black Sea	Explain that the Mediterranean Sea has always been very important to the surrounding countries and still remains so today. Great port cities are located in all the countries bounding the Mediterranean coast: Barcelona and Valencia in Spain; Marseilles in France; Genoa, Naples, and Venice in Italy; Piraeus, the port of Athens, Greece; Istanbul, Turkey; Beirut, Lebanon; Haifa and Tel Aviv, Israel; Alexandria, Egypt; Algiers, Algeria; Odessa on the Black Sea arm in Ukraine; and many others.	27-30
Mediterranean Sea and Black Sea	Explain that the ports and countries around the Mediterranean are familiar places to sailors, world politicians, and tourists. There are many Naval bases in the Mediterranean. The main Spanish base is at Barcelona, a favorite port of call for U.S. Naval ships. The principal French base is at Toulon, near the beautiful Riviera cities of Nice and Cannes, also favorite resorts for U.S. Sixth Fleet Sailors.	31-33
Check on Learning Questions B (Lesson questions 5-6)	Check in on students’ understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	34
Mediterranean Sea and Black Sea	Explain that the Italian Navy’s Headquarters is at La Spezia, and its fleet’s biggest southern base is in Taranto. Explain that other important bases in the Mediterranean include: La Maddalena, Gaeta, Izmir, and Naples.	35-36
Mediterranean Sea and Black Sea	Explain that the Southern Command of N.A.T.O. has its Headquarters near Naples, with another important base at Izmir, Turkey. The home port of the flagship of the U.S. Sixth Fleet is at Gaeta, Italy, about halfway between Rome and Naples.	37-38
Mediterranean Sea and Black Sea	Explain that the Ukrainian Black Sea fleet Headquarters is located at Sevastopol on the Crimean Peninsula. Major shipyards for Merchant and Naval surface ships are located at Nikolayev near Odessa, which is where Russian aircraft carriers are built.	39-41
Mediterranean Sea and Black Sea	Explain that we have talked about the Strait of Gibraltar as the doorway to the Atlantic Ocean from the Mediterranean Sea. There are two other key choke points of navigation associated with the Mediterranean area: the Turkish straits, called the Bosphorus and the Dardanelles, and the Suez Canal.	42-43
Mediterranean Sea and Black Sea	Explain that in times of peace, the Turkish straits are open to all ships by international agreement. In war, however, the straits may be closed to any nation at war with Turkey. Turkey is a member of N.A.T.O. Russian and Ukrainian naval vessels from Black Sea ports freely use the straits to support and relieve the ships in the Mediterranean.	44
Mediterranean Sea and Black Sea	Explain that the Suez Canal is a vital waterway for the allies. Most surface cargo between Europe and Asia passes on this narrow water path through the Egyptian desert. As was proved in the Arab-Israeli wars in 1967 and 1973, the canal can be quickly blocked with mines or a few sunken ships.	45

Chapter 1 / Section 3: NS2-M3C1S3 – Mediterranean Sea and Black Sea

Mediterranean Sea and Black Sea	Explain that farther to the west, during the late 1970s and early 1980s, the North African country of Libya and its dictatorial ruler Muammar Qaddafi, became a growing sponsor for terrorist activity throughout the Mediterranean basin. This continued until 1986, when in retaliation for several Libyan-sponsored terrorist attacks, the United States launched an attack against Qaddafi's terrorist bases. A Libyan air base was hit during the air strike. The area has been relatively quiet ever since.	46-48
Review Question	The Review Question is, "List 2-3 reasons why the Strait of Gibraltar is geographically strategic." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	49
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	50
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	51

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Double Bubble Thinking Map handout

When: will take place at the conclusion of the lesson and are wrap up activities for M3C1S3

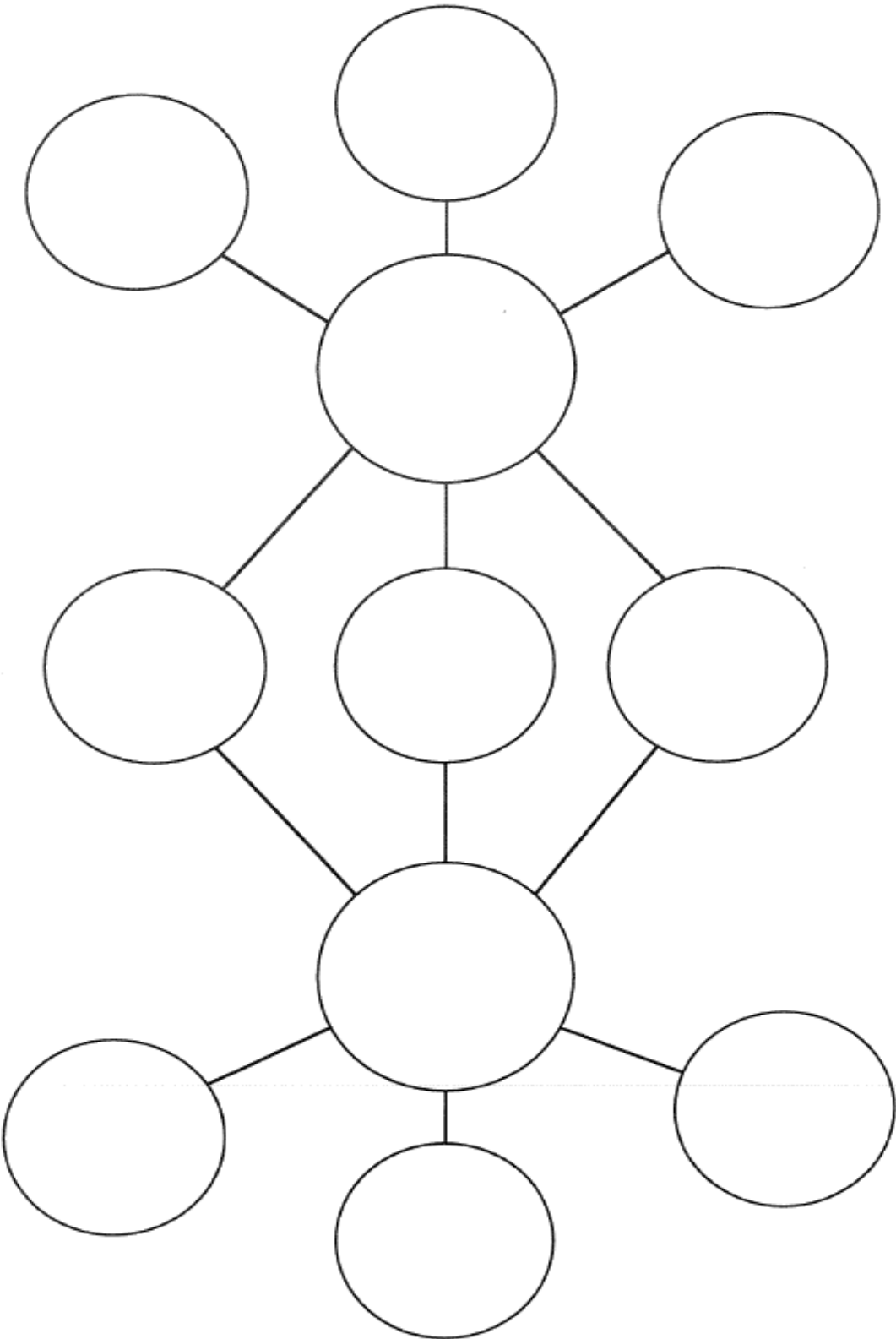
- In-Class: Cadets will create a Double Bubble Thinking Map comparing and contrasting the Mediterranean and Black Seas to the Atlantic and Pacific Oceans. In one big bubble, students write 'Atlantic Ocean' and in the second big bubble, students write 'Mediterranean and Black Seas'. The bubbles between the two big bubbles are for the similarities and the bubbles to the side are for the differences

B. Take Home Activity: Cadets will write a brief response to the question, "Why is it important, both economically and strategically, for the U.S. to protect the oceans of the world?"

Within the writings, students should point out the resources that come from the different oceans and the strategy those oceans provide in times of peace and conflict.

IV. Evaluation - see CPS database for chapter test questions.

Double Bubble Map



Name _____

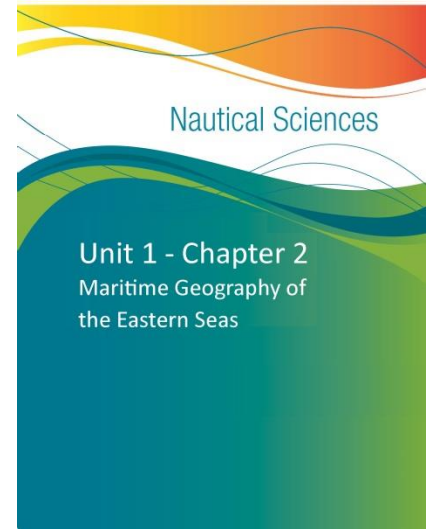
Module 3 Chapter 2: NS2-M3C2 – Maritime Geography of the Eastern Seas

What Students Will Learn to Do:

Illustrate an understanding of maritime geography as it relates to our national resources, landforms, climate, soil, bodies of water, people, governments, military and geopolitics

Skills and Knowledge to be Gained:

1. Cite the importance of the Red Sea and Gulf of Aden to American interest
2. Explain the role of the United States and its allies in the Persian Gulf and the Gulf of Oman
3. Describe the Indian Ocean in terms of its economic and strategic value to the United States and its allies.
4. Describe the value of the Pacific Ocean to the United States and its allies.
5. Describe the value of the Pacific Ocean to the United States and its allies
6. Describe the special features of the Southern Ocean



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...
- RI.9-10.8. Delineate and evaluate the argument and specific claims in a text...

Writing

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.3. Write narratives to develop real or imagined experiences or events using effective technique...
- W.9-10.6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products...

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...

Module 3 Chapter 2: NS2-M3C2 – Maritime Geography of the Eastern Seas

- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Geography

- D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them.
- D2.Geo.5.9-12. Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.
- D2.Geo.12.9-12. Evaluate the consequences of human-made and natural catastrophes on global trade, politics, and human migration.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...
- D2.His.3.9-12. Use questions generated about individuals and groups to assess how the significance of their actions changes over time and is shaped by the historical context.

Next Generation Science Standards (NGSS)

HS.Human Sustainability

- HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 2 / Section 1: NS2-M3C2S1 – The Middle East

(Section 1 of 3)

What Students Will Learn to Do:

Demonstrate an understanding of maritime geography as it relates to our national resources, landforms, climate, soil, and bodies of water, people, governments, military and geopolitics

Skills and Knowledge to be Gained:

1. Cite the importance of the Red Sea and Gulf of Aden to American interest
2. Explain the role of the United States and its allies in the Persian Gulf and the Gulf of Oman

LESSON FLOW OUTLINE

Unit Overview	Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	The Suez Canal, Red Sea and Gulf of Aden (A)
Check On Learning A	The Suez Canal, Red Sea and Gulf of Aden (B)	The Persian Gulf and Gulf of Oman (A)	Check on Learning B	The Persian Gulf and Gulf of Oman (B)	Review Questions	Closing Questions	Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 2. Place a checkmark beside the NS2-M3C2S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C2S1 - Key Terms and NS2-M3C2S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 2 / Section 1: NS2-M3C2S1 – The Middle East

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will discuss the eastern seas and their importance. Since nearly 75 percent of our world is covered by water, it should be clear that the seas are important to life on the Earth. We will discuss the importance of the Red Sea, the Gulf of Aden, the Persian Gulf, the Gulf of Oman, the Pacific Ocean, and the Antarctic Ocean in terms of their economic and strategic value to the U.S. and its allies.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-7
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “List 2-3 reasons that the Middle East area is important to the world.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the introduction to maritime geography and the eastern seas.	8
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	9
Introduction	Explain that oil—its source and the sea routes over which it travels—dominates most trade in the seas south of Asia. From the Persian Gulf and Arabian Sea, the routes go westward to the Red Sea and Suez, and eastward through the Strait of Malacca and the seas around China to Japan. Trade moves from eastern Africa, India, Indonesia, and western Australia to Suez. It moves from China, Japan, Indonesia, and the islands of the Pacific to the West Coast of the United States and South America. Suez to Singapore, the most important British lifeline of past years, remains the scene of trade and travel between the Orient and the West.	10-16
Introduction	Explain that because of the strategic importance of the Middle East including its warm-water ports, its oil and the hundreds of millions of people who call the area their home, many of whom are trying to survive with weak governments and poor environments, U.S. Naval Forces operate routinely in the Indian Ocean. The U.S. Fifth Fleet flagship has its homeport in Manama, Bahrain. The United States maintains friendships in the region despite political and economic unrest. Third World nations strive to improve the lives of their people and in order to do so, must look to the seas.	17-19

Chapter 2 / Section 1: NS2-M3C2S1 – The Middle East

The Suez Canal, Red Sea and Gulf of Aden	Explain that the Red Sea is a warm, very salty sea stretching approximately 1,300 miles southeast from the Egyptian port of Suez to the Strait of Bab el Mandeb. It is only 90 to 200 miles wide, with an area of 169,000 square miles. The Axial Trough in the very middle of the narrow sea is deepest at 9,580 feet near the Saudi Arabian port of Jidda.	20-22
The Suez Canal, Red Sea and Gulf of Aden	Explain that the Red Sea has no known oil deposits. It is a possible future source of valuable metals. Pools of boiling hot brine are found in the Axial Trough. These waters are rich in dissolved metals, including zinc and copper, in the seabed muds. It may be possible to one day mine these minerals.	23
The Suez Canal, Red Sea and Gulf of Aden	Explain that there is very little fishing in the Red Sea. Many kinds of fish are caught, but with the exception of sardines near the Gulf of Suez, there is no major fishery. Since coral reefs make bottom trawling risky and expensive, lights must be used to attract fish to the nets.	24-26
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	27
The Suez Canal, Red Sea and Gulf of Aden	Explain that the Port of Suez is important because it is the southern anchorage for ships waiting to go through the canal northward to the Mediterranean Sea. Port Said on the northern end of the canal is important for the same reason. Massawa is the only port and Naval base in Eritrea. Jidda, a seaport in Saudi Arabia, serves as a port of entry for the Moslem holy city of Mecca, about forty miles inland.	28-30
The Suez Canal, Red Sea and Gulf of Aden	Explain that Djibouti, the capital city and port in the nation of the same name, is the major African port on the Horn of Africa, on the Gulf of Aden. It not only serves its own country but also is the main port for shipment of Ethiopian imports and exports. The major port of the area is Aden, capital of Yemen.	31-33
The Suez Canal, Red Sea and Gulf of Aden	Explain that the Red Sea is a strategic waterway. Along with the Suez Canal and Gulf of Suez to its north, and the Gulf of Aden to the south, the Red Sea is the main waterway between Europe and Asia. The northern access is the Suez Canal. The choke point in the south is the Strait of Bab el Mandeb. (The Arabic word bab means "gate" or "strait.") Less than 20 miles wide, the strait separates Yemen on the Arabian Peninsula from Ethiopia and the Republic of Djibouti in Africa.	34-35
The Persian Gulf and Gulf of Oman	Explain that the Persian Gulf area is the leading oil-producing area in the world. The gulf is bounded by Iran on the north, Kuwait and Iraq at the northwest end, Saudi Arabia on the west, and the Arab sheikdoms of Bahrain island, Qatar, United Arab Emirates (U.A.E.), and Oman on the south and southeast. Each of these countries are major oil producers. The Gulf itself has been divided for oil drilling by these nations, since much of the oil is produced by offshore rigs.	36-39
The Persian Gulf and Gulf of Oman	Explain that today, approximately one third of the total oil production of the world comes from the Persian Gulf.	40
The Persian Gulf and Gulf of Oman	Explain that the United States, Western Europe, and Japan have come to depend in large part on Arab oil. The United States imports approximately 40 percent of its annual oil needs from the area while Western Europe imports about 70 percent, and Japan more than 90 percent of its annual needs.	41
The Persian Gulf and Gulf of Oman	Explain that the major oil-exporting ports are Ras Tannura, Saudi Arabia, Abadan and Kharg Island, Iran, Sitra, Bahrain, Das Island, United Arab Emirates, and Mina Abdulla, Mina Shauiba, and Mina Al-Ahmadi, Kuwait.	42

Chapter 2 / Section 1: NS2-M3C2S1 – The Middle East

The Persian Gulf and Gulf of Oman	Explain that the entire Persian Gulf is shallow. Half the Gulf is less than 120 feet deep, and all but a few spots are less than 200 feet. Because it is so shallow, sunlight can reach the bottom in most places, creating a host of plankton to live there. Plankton are tiny animals and plants that provide food for small fish. Since plankton is more than plentiful, a large variety of fish live in the gulf. Sardines, anchovies, mackerel, and barracuda are the main varieties caught by local fishermen. In the waters controlled by Qatar and the United Arab Emirates are valuable pearl fisheries.	43-46
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	47
The Persian Gulf and Gulf of Oman	Explain that while oil is the big strategic resource, the political and strategic geography of the gulf is also important. Acquiring a warm-water port on the Persian Gulf has been a major goal of Russia and the states of the former Soviet Union for the past one hundred years. A major political goal of Western nations over the same period has been to prevent the acquisition. Before the fall of the Shah of Iran in 1979, Iran was an ally of the United States and the West. The United States had helped to build two new Iranian Naval bases, one at Bandar Abbas on the Strait of Hormuz and the other at Chah Bahar on the Gulf of Oman.	48-51
The Persian Gulf and Gulf of Oman	Explain that after the fall of the Shah, armed uprisings of various Islamic fundamentalist factions in Iran put the country in chaos, as exemplified by the U.S. hostage situation in 1979–81, followed by a very destructive war of attrition with Iraq that did not end until 1988.	52-54
The Persian Gulf and Gulf of Oman	Explain that peace in the area was short-lived because with his forces no longer engaged in the war with Iran, Iraq's leader Saddam Hussein was then free to pursue far more serious military actions two years later, when he invaded neighboring Kuwait. In response to the invasion, the United States and other United Nations (U.N.) coalition forces conducted Operations Desert Shield and Desert Storm and ultimately forced Hussein's troops out of Kuwait in late February, 1991.	55-58
The Persian Gulf and Gulf of Oman	Explain that for the next dozen years Hussein played a delicate game of engaging in periodic provocative activities. He violated U.N.-imposed no-fly zones and interfered with U.N. inspection teams searching for evidence of weapons of mass destruction, backing down just enough to prevent retaliation by the West. Finally, in March 2003 after Hussein disregarded repeated demands by the United States and others to disarm and leave the country, the United States, along with several other European coalition partners, launched Operation Iraqi Freedom to rid the country of Hussein and his abusive regime. Within a short time, coalition forces advanced to Baghdad in a blitzkrieg-like invasion and forced Hussein to flee and thereby relinquish control of the country to the U.S.-led coalition in early May.	59-62
The Persian Gulf and Gulf of Oman	Explain that unfortunately, hostilities in Iraq did not end with the coalition victory. Even after Hussein was captured in December 2003, insurgents, terrorists, and religious extremists continued to launch attacks against both coalition and Iraqi peacekeeping forces, and the civilian population. A variety of tactics were used such as kidnapping, suicide bombers, and remotely detonated improvised explosive devices. These attacks have continued to the present, keeping the region in turmoil and causing thousands of casualties to U.S. and coalition troops, government officials and police, and civilians throughout the country.	63-65

Chapter 2 / Section 1: NS2-M3C2S1 – The Middle East

Review Question	The Review Question is, “Discuss how Saddam Hussein’s actions affected events in the Middle East and the world.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	66
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	67
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	68

III. Supplemental Activities -

A. In Class Activity:

Supplies required: handout “Middle East Map Activity”

When: The ‘In Class Activity’ should take place during the lesson. Cadets can label the map as they hear the information in the lesson. Alternatively, the ‘In-Class Activity’ could take place at the end of the lesson.

- In-Class: Cadets will complete the Middle East map activity. This could be done as the lesson is being delivered.

B. Take Home Activity: Cadets will complete the Persian Gulf oil production/consumption activity.



Tech Tip: The US Department of Energy has a useful site to explore the world’s oil and other energy sources.

<http://www.eia.gov/countries/index.cfm?view=production>

IV. Evaluation - see CPS database for chapter test questions.

Chapter 2 / Section 1: NS2-M3C2S1 – The Middle East

Activity1: In Class Activity: Middle East Map Activity

Name: _____ Date: _____ Class: _____

Directions: Using the blank Middle East Map, label the following sites. Color the oceans blue.

Strait of Hormuz

Red Sea

Sudan

Jordan

Saudi Arabia

Gulf of Aden

Bab el Mandeb

Persian Gulf

Ethiopia

Iran

Qatar

Gulf of Oman

Strait of Malacca

Indian Ocean

Eritrea

Yemen

United Arab

Emirates

Bahrain

Suez Canal

Egypt

Somalia

Oman

Port of Suez

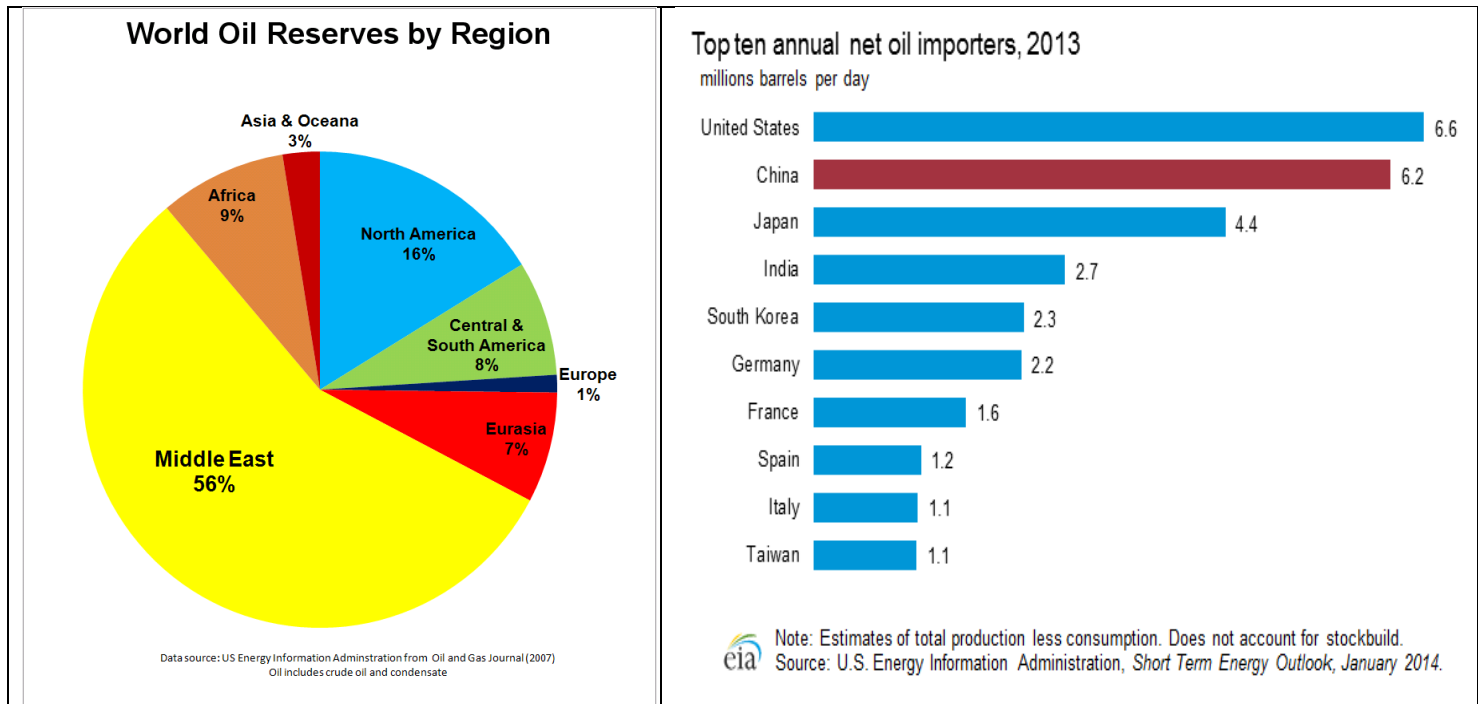


Chapter 2 / Section 1: NS2-M3C2S1 – The Middle East

Activity 1: Take Home Activity - Persian Gulf oil production/consumption

Name: _____ Date: _____ Class: _____

Directions: Study the graphs below and answer the questions that follow.



1. Which part of the world has the most oil?
2. Which part of the world uses the most oil?
3. What surprises you about the information in the chart?
4. What do you wonder about the information in the chart?
5. What conclusions can you make with this information?
6. Why is the Persian Gulf area so important to the United States?

Chapter 2 / Section 2: NS2-M3C2S2 – Indian Ocean

(Section 2 of 3)

What Students Will Learn to Do:

Demonstrate an understanding of maritime geography as it relates to our national resources, landforms, climate, soil, and bodies of water, people, governments, military and geopolitics.

Skills and Knowledge to be Gained:

1. Describe the Indian Ocean in terms of its economic and strategic value to the United States and its allies.
2. Describe the value of the Pacific Ocean to the United States and its allies.

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Warm Up Questions	Indian Ocean (A)	Check On Learning A	Indian Ocean (B)
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Check on Learning B	Pacific Ocean	Review Questions	Closing Questions	Call for Other Questions
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Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 2. Place a checkmark beside the NS2-M3C2S2 PowerPoint presentation, and these two CPS question deck files: NS2-M3C2S2 - Key Terms and NS2-M3C2S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 2 / Section 2: NS2-M3C2S2 – Indian Ocean

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will continue to discuss the eastern seas and their importance. Since nearly 75 percent of our world is covered by water, it should be clear that the seas are important to life on the Earth. We will discuss the importance of the Red Sea, the Gulf of Aden, the Persian Gulf, the Gulf of Oman, the Pacific Ocean, and the Antarctic Ocean in terms of their economic and strategic value to the U.S. and its allies.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-7
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “List reasons that it is important to protect the world’s oceans.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the Indian Ocean.	8
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	9
Indian Ocean	Explain that the Indian Ocean is the third largest in the world. It has an area of 28,400,000 square miles with an average depth of 12,760 feet. Maximum depth is 24,442 feet in the Java Trench southwest of the Indonesian islands of Sumatra and Java on the eastern edge of the ocean.	10
Indian Ocean	Explain that the main feature of the Indian Ocean floor is a great mid-ocean ridge system, which is shaped like the inverted letter ‘Y’. The Southwest Indian Ridge goes around southern Africa and joins the Mid-Atlantic Ridge. The Mid-Indian Ridge continues south of Australia to join with the Mid-Pacific Rise. Many volcanoes lie along the submarine ridges of the Indian Ocean. Many of the islands in the ocean were formed by active and inactive volcanoes.	11-12
Indian Ocean	Explain that two of the world’s greatest river systems, the Indus River of Pakistan and Ganges-Brahmaputra of India, have built huge submarine fans into the Arabian Sea and Bay of Bengal. These fans are made up of sediments carried from the Himalaya Mountains in those two countries.	13

Chapter 2 / Section 2: NS2-M3C2S2 – Indian Ocean

Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	14
Indian Ocean	The Himalaya Mountain range extends about 1,500 miles along the border between India and Tibet. Mount Everest is the highest peak of the Himalayan Mountain range at 29,028 feet.	15
Indian Ocean	Explain that mining along the Indian Ocean floor is becoming more important. Tin ore is mined off the shores of Thailand, Malaysia, and Sumatra in the Strait of Malacca. Deposits of sands rich in rare heavy minerals such as monazite, zircon, and magnetite are mined off Sri Lanka, the Indian state of Kerala, the east coast of South Africa, and near Perth in western Australia. A major oil field also lies off the western coast of Australia. Rich beds of manganese chunks have been found on the Indian Ocean floor. Methods are being developed to mine these valuable clusters of manganese, nickel, copper, titanium, and lead.	16-19
Indian Ocean	Explain that the fishing industry in the Indian Ocean is small, but is rapidly growing. It now exceeds four million tons annually. Tuna and shrimp off the coast of India are the main catches at this time. Japanese, Korean, and Taiwanese vessels are now combing the ocean for these species. Most of the shrimp are canned and sold on the U.S. market. Lobsters are caught off the coasts of South Africa and western Australia also for the U.S. market. The Indian Ocean catch will continue to grow in value, as fishing and canning techniques improve and the demand for fish protein increases.	20-21
Indian Ocean	Explain that the United States has built a small communications station and air base on Diego Garcia in the mid-Indian Ocean in order to support naval communications and deployed Indian Ocean forces.	22
Indian Ocean	Explain that we have already discussed two of the main sea routes in the Indian Ocean. They are the oil routes from the Persian Gulf through the Red Sea to Suez, and along the east coast of Africa and around the Cape of Good Hope. The other major sea-lane is past Singapore at the tip of the Malay Peninsula, through the Strait of Malacca, and across the Indian Ocean to Suez. Explain that the Strait of Malacca is a main route between Asia and Europe, and is the route Japanese oil tankers follow from the Persian Gulf to Japan. This strait is one of the key strategic choke points of navigation in the world.	23
Indian Ocean	Explain that in the spring of 1998, much apprehension over nuclear weapons' proliferation in the region arose when India and Pakistan each detonated nuclear test devices. There followed a period of escalating tension between the two nations that might have led to a regional nuclear war but for American intervention in conjunction with the United Nations. The issue of nuclear nonproliferation in the area continues to be a major concern.	24
Indian Ocean	Explain that in the late 1990's, the issue of support of terrorist activities in this region became of great concern, particularly in regard to Afghanistan. Bordered by Pakistan to the south and east, Iran to the west, and in the north and northeast by Russia and China, this poverty-stricken and rugged country became the adopted home of one of the foremost terrorist organizations of modern times, led by a wealthy exiled Saudi Arab by the name of Osama bin Laden. In the fall of 2001, the country became the scene of Operation Enduring Freedom. U.S. and allied military forces joined with Afghan rebels to rid the country of bin Laden's al-Qaida terrorist organization and the repressive Taliban government that supported him.	25-27

Chapter 2 / Section 2: NS2-M3C2S2 – Indian Ocean

Indian Ocean	Explain that principal Navies of nations around the Indian Ocean are those of South Africa, India, and Australia. Pakistan has a small but efficient Navy. The French also have a Naval force based at Réunion, to protect their Indian Ocean interests.	28
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	29
Pacific Ocean	Explain that covering nearly one-third of Earth's surface, the Pacific Ocean is by far the largest of the world's oceans. It covers an area of 64,000,000 square miles with an average depth of 14,050 feet. The deepest part of the ocean is the Marianas Trench, which at 36,161 feet at its maximum depth is also the deepest spot on Earth.	30-31
Pacific Ocean	Explain that the western half of the Pacific sea floor is complex, with thousands of volcanic peaks, trenches, ridges, and submarine plateaus. Many of the volcanoes are no longer active and are in various stages of erosion from sea and weather action. The tops of these volcanic peaks are the beautiful Pacific islands one dreams about. There are many coral reefs, which teem with colorful marine life. The most famous and largest reef is the Great Barrier Reef, which runs more than 1,250 miles along the coast of northeastern Australia.	32-34
Pacific Ocean	Explain that the Hawaiian Islands and the Society Islands, which include Tahiti and Bora Bora, are beautiful locations. They are the classic South Sea Islands of waving palms and white beaches. Many other South Sea Islands, however, especially in the Southwest Pacific, are deadly jungles with disease, stifling heat, incessant rains, and few natural resources.	35-37
Pacific Ocean	Explain that not much mining is done in the Pacific yet, but many large mineral deposits have been located in coastal areas and on the ocean floor. Some tin is mined off the Indonesian island of Sumatra. Iron ore has been mined for years off Japan and mineral sands (titanium, zircon, and monazite) are mined off the coast of Queensland, Australia. There are small working oil fields between Australia and Tasmania and also off the coast of New Zealand's North Island. Other oil drilling is taking place off the coast of southern California and in the Cook Inlet of Alaska. Phosphates are mined along the coasts of Chile, Peru, and Baja California in Mexico.	38-42
Pacific Ocean	Explain that there are vast fields of manganese chunks throughout much of the Pacific. An especially heavy belt of manganese extends from Baja California to Hawaii, and from Hawaii to the islands of Palau and northward to Japan. It is estimated that this area, comprised of nearly 1.35 million square miles, is literally paved with manganese! A number of companies are working to find an inexpensive way to mine this vast undersea resource.	43
Pacific Ocean	Explain that the annual catch of fish and shellfish from the Pacific greatly exceeds that taken in any other ocean. More than half of all of the world's catch of marine fish, shellfish, and crustaceans (crabs and lobsters) comes from the Pacific each year.	44-45
Pacific Ocean	Explain that most fisheries are located within 150 miles of the coasts. The exception to this is tuna fishing, which takes place throughout the high seas. There are large fisheries for cod, Pollock, flounder, rockfish, sea bass, and red snapper throughout the Asiatic continental shelf, in the eastern Bering, Okhotsk (O--ko'tsk'), Japan, and Yellow and South China Seas. Sardine and anchovy fisheries lie off Peru, California, northern Japan, and Korea. Pollock and salmon are fished in the Gulf of Alaska and off the coasts of Washington and Oregon states.	46-48

Chapter 2 / Section 2: NS2-M3C2S2 – Indian Ocean

Pacific Ocean	Explain that there are very important fisheries for shrimp, crab, lobster, and squid in the waters across the northern Pacific. Giant shrimp, or prawns, are caught in the Yellow and South China Seas, off the coasts of northern Australia and in the Gulf of Alaska. The largest of all crab, the Alaskan king crab, is taken in the Gulf of Alaska along the Aleutian Islands and in the Sea of Okhotsk. These huge crabs sometimes grow to more than three feet across from claw to tail. Huge lobster are caught around most islands of the Pacific.	49-51
Review Question	The Review Question is, “Name 2-3 important resources that come from the oceans.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	52
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	53
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	54

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handout for In Class and Take Home Activities

When: The In-Class Activity can be done at any time within the lesson

- In-Class: Cadets will complete the vocabulary exercise where they categorize the vocabulary words from the western and eastern seas lessons. Once in categories, cadets will label each category. Cadets should be prepared to share their categories and the rationale for each, with a partner.

B. Take Home Activity: Cadets will complete the “What am I” activity using the vocabulary words.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 2 / Section 2: NS2-M3C2S2 – Indian Ocean

Activity1: In Class Activity: Vocabulary Categorization

Name: _____ Date: _____ Class: _____

Directions: Listed below are the vocabulary words for the Western and Eastern Seas units. If you choose, for this activity, you may cut out the words. Please categorize the words into groups. Once you have categorized them, and give each category (group) a label.

Prudhoe Bay	North Sea Route	Bosporus
Marianas Trench	Crustacean	Prawns
Titanium	Plankton	Strait of Gibraltar

Chapter 2 / Section 2: NS2-M3C2S2 – Indian Ocean

Skagerrak Strait	Mid-Atlantic Ridge	Northwest Passage
Latin America	Dardanelles	Circumpolar
Research Station	Strait of Hormuz	Bab el Mandeb
Strait of Malacca	Suez Canal	Dogger Bank
G-I-UK Gap	Langusta	Lake Maracaibo

Chapter 2 / Section 2: NS2-M3C2S2 – Indian Ocean

Activity1: Take Home Activity: What Am I Activity

Name: _____ Date: _____ Class: _____

Directions: Choose ONE vocabulary word from the 'In-Class Activity' and create a 'What Am I' activity with the word. Provide clues to the word and try to make each clue easier as you go. This activity will be given to a classmate to try and solve. An example is below. Provide at least 10 clues to the identity of your word.

Example:

1. *I am made of water.*
2. *I am in the Middle East.*
3. *I am a sea passage.*
4. *I am a strategic choke point.*
5. *To my north is Iran.*
6. *To my south is U.A.E.*
7. *Many shipments of oil pass thru me.*
8. *I am between the Gulf of Oman and the Persian Gulf.*
9. *I am a in a strategic location for international trade.*
10. *I am a strait.*

Answer: Strait of Hormuz

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Answer:

Chapter 2 / Section 3: NS2-M3C2S3 – Pacific Ocean

(Section 3 of 3)

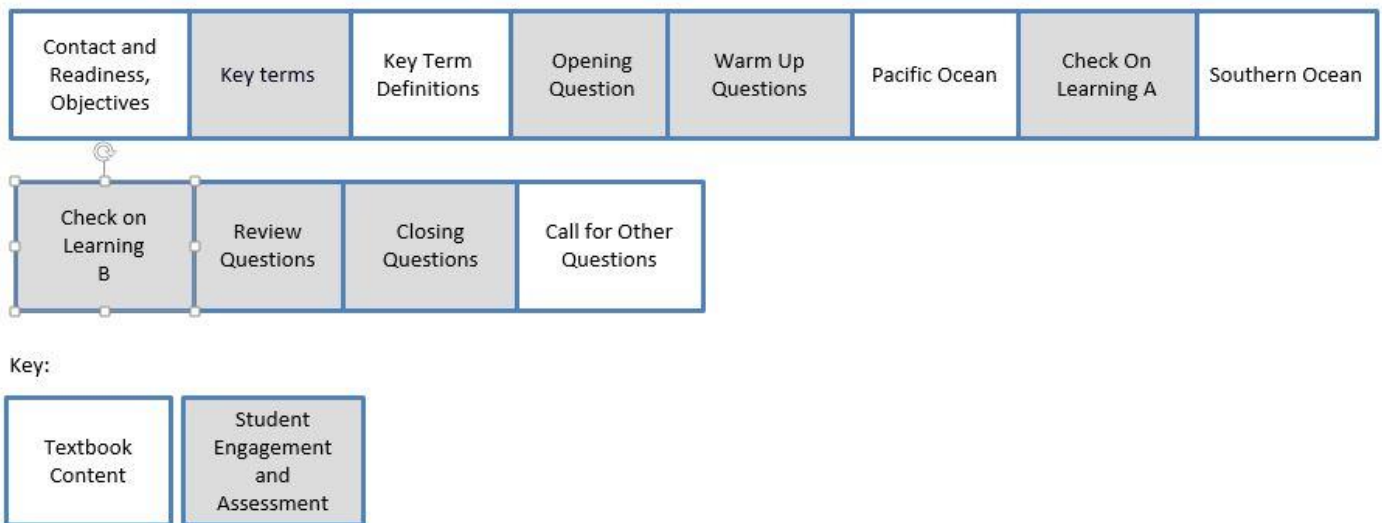
What Students Will Learn to Do:

Demonstrate an understanding of maritime geography as it relates to our national resources, landforms, climate, soil, and bodies of water, people, governments, military and geopolitics

Skills and Knowledge to be Gained:

1. Describe the value of the Pacific Ocean to the United States and its allies
2. Describe the special features of the Southern Ocean

LESSON FLOW OUTLINE



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 2. Place a checkmark beside the NS2-M3C2S3 PowerPoint presentation, and these two CPS question deck files: NS2-M3C2S3 - Key Terms and NS2-M3C2S3 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 2 / Section 3: NS2-M3C2S3 – Pacific Ocean

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will continue to discuss the Eastern seas and their importance. Since nearly 75 percent of our world is covered by water, it should be clear that the seas are important to life on the Earth. We will discuss the importance of the Red Sea, the Gulf of Aden, the Persian Gulf, the Gulf of Oman, the Pacific Ocean, and the Antarctic Ocean in terms of their economic and strategic value to the U.S. and its allies.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Why is it important to study the oceans?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on Pacific Ocean.	6
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	7
Pacific Ocean	Explain that the most impressive thing about the geography of the Pacific is its size. Some examples are: the distance from the Panama Canal to Yokohama, Japan is 7,680 miles, and to Singapore, 10,529 miles; from San Francisco to Manila, Philippines is 6,299 miles, to Melbourne, Australia is 6,970, to Hong Kong, 6,044, to Singapore, 7,350, and to Honolulu, Hawaii, 2,091 miles. From Yokohama to Singapore through the Taiwan Strait the distance is 2,880 miles. Distance, therefore, is certainly an important factor to consider when discussing Pacific strategy.	8-11
Pacific Ocean	Explain that, in addition to the ports mentioned above, there are many others of importance: Seattle and Los Angeles in the United States; Calleo, the port of Lima, Peru; Santiago, Chile; Wellington and Auckland, New Zealand; Sydney and Brisbane, Australia; Jakarta, Indonesia; Singapore; Bangkok, Thailand; Canton and Shanghai, China; Kobe and Osaka, Japan; Taipei, Taiwan; Haiphong, Vietnam; and Vladivostok, Russia.	12-15
Pacific Ocean	Explain that the major U.S. Naval base on the West Coast is San Diego, California. Smaller operating bases are located at Seattle. There are U.S. Naval shipyards at Bremerton, Washington and Mare Island, California. Civilian shipyards with major	16-19

Chapter 2 / Section 3: NS2-M3C2S3 – Pacific Ocean

	Naval ship contracts are in Seattle, San Francisco, Los Angeles, and San Diego.	
Pacific Ocean	Explain that U.S. Naval bases in the Pacific are located at Pearl Harbor, Hawaii, and Yokosuka, Japan. The U.S. Third Fleet has its headquarters at San Diego, California. The U.S. Seventh Fleet flagship is based in Yokosuka, where there is a large ship-repair facility with dry-docks. There is a large Naval air facility located at Atsugi, near Tokyo, which is the primary base for support of U.S. Naval Aviation in the western Pacific. Although most ships in the Seventh Fleet deploy from home ports on the U.S. West Coast, a carrier battle group has maintained its home port in Yokosuka, Japan for over forty years.	20-25
Pacific Ocean	Explain that the Russian Pacific Fleet has its Headquarters at Vladivostok. Other Naval bases are located in Nakhodka, Sovetskaya Gavan, and Petropavlosk. A submarine-building yard is located far up the Amur River at Komsomolsk.	26-27
Pacific Ocean	Explain that the Chinese Navy is small but growing in strength. It has bases in a number of Chinese ports, including Amoy, Shanghai, Tsingtao, and Dairen. The Indonesians have a Naval base at Sura-baja; the Taiwanese at Kaohsiung; the South Koreans at Pusan; and the Thais at Sattahip. The Japanese have a small Maritime Self Defense Force, which is capable of limited operations around the home islands.	28-33
Pacific Ocean	Explain that the U.S. Navy has two main tasks in event of a war in the Pacific: (1) protect the long supply lines to our forces and (2) keep the sea-lanes open to our allies, primarily Japan, South Korea, the Philippines, Thailand, Australia, and New Zealand.	34
Pacific Ocean	Explain that Japan is the key to U.S. foreign policy in Asia and the principal nation to be defended in the Far East. Japan's industries and their hardworking people make Japan the most prosperous country in the area. At the same time, the World War II peace treaty prohibits Japan from having armed forces with an offensive capability. The United States, by treaty, is obligated to defend Japan from foreign attack.	35
Pacific Ocean	Explain that treaties also commit U.S. forces to help our other Pacific allies in the event of aggression. We have strong mutual defense ties with Australia and New Zealand. The United States keeps a U.S. Army force permanently deployed in South Korea. There is always some level of North Korean threat against this ally, including in recent years, the capability to build nuclear weapons. U.S. forces were scheduled to be withdrawn in the early 1980s, but this withdrawal has been delayed indefinitely by the North Korean threat.	36-37
Pacific Ocean	Explain that after the Vietnam War, U.S. relations with China have steadily improved. Establishment of full diplomatic relations, including the exchange of ambassadors, occurred in 1979. A reversal occurred in mid-1989, however. Chinese army tanks and troops brutally attacked students in Tiananmen Square in Beijing during a peaceful demonstration for democratic reform. Thousands of demonstrating students were killed or wounded and many were later jailed or executed as criminals. The Chinese government later tried to deny the crackdown ever took place. The incident caused renewed concern over the issue of human rights in China that continues to this day.	38-40
Pacific Ocean	Explain that in April 2001, a U.S. Navy reconnaissance aircraft flying a mission over international waters in the South China Sea suffered a midair collision with an intercepting Chinese fighter jet. The American plane made an emergency landing at China's Hainan Island south of the mainland. Its crew was detained for the next eleven days until they were released into U.S. custody. This incident caused U.S.-China relations to sink to a new low, but some improvement has occurred since. The military threat posed by China in the region and their poor record on human rights will be an ongoing concern to the United States for some time to come.	41-45

Chapter 2 / Section 3: NS2-M3C2S3 – Pacific Ocean

Pacific Ocean	Explain that the United States has formal economic and defense ties to several Pacific island groups that were formerly part of the Trust Territory of the Pacific Islands administered by the U.S. on behalf of the United Nations. These include the Marshall Islands, Caroline Islands, and the Mariana Islands. These islands were all taken from the Japanese during World War II.	46-47
Pacific Ocean	Explain that in general, the Pacific has been calm in recent years. Smoldering difficulties remain in most Asian nations, however. The United States has to keep alert in the area by having Naval forces deployed in the area at all times.	48
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	49
Southern Ocean	Explain that the seas around Antarctica are circumpolar; that is, they surround the south polar continent of Antarctica. In area, they total about 13.5 million square miles. More than half, about 8 million square miles, freezes over each winter, and 1.5 million square miles are frozen year around.	50-51
Southern Ocean	Explain that the water and ice boundaries are determined by water movement. There is a rather well-defined zone in which southward-flowing warm water rises over the column of cold Antarctic waters flowing northward. The cold-water portion of the water column is called the polar front, and the warmer surface zone is called the Antarctic convergence. This convergence is the northernmost boundary of the Antarctic seas, generally about 55 degrees south latitude.	52
Southern Ocean	Explain that the continental shelf of Antarctica is very narrow. Oceanic basins 13,000 to 16,500 feet deep lie beyond the steep continental slope. The northern edge of these basins is the mid-ocean ridge system that separates the Antarctic from the Atlantic, Indian, and Pacific Ocean basins. Explain that modern drilling and infrared photography have found many minerals in Antarctica and its surrounding seas, but these deposits are currently too expensive to mine.	53
Southern Ocean	Explain that whaling was a thriving business in the Antarctic for a hundred years until the early 1930s. Then modern floating factory ships and fast whalers with harpoon guns brought the whale population to the point of extinction. Only about one-tenth of the original whale population still survives, and a number of species are nearly extinct. The market for whale products has dropped dramatically, though, so the demand for whales has decreased. Iceland and Japan still engage in whaling, under some control by the International Whaling Commission.	54-55
Southern Ocean	Explain that there is the harvesting of krill, a name given to small shrimp-like animals that abound in some Antarctic waters during certain seasons of the year. Krill is of only limited commercial value.	56
Southern Ocean	Explain that there is a research base at McMurdo Sound run by the National Science Foundation. The U.S. Navy helps to maintain and supply this research base though no military operations in Antarctica are permitted under international treaty. It has been manned since the International Geophysical Year explorations in the 1960s. Australia and New Zealand have research sites in other areas of the continent.	57-59
Southern Ocean	Explain that Antarctica is out of the mainstream of the world's air and sea-lanes. There is little interest in Antarctica at the present time, either for resources or for strategic reasons. Exploration and cold-weather equipment testing are now the main activities there. Also, basic research is being conducted on marine life and the weather. Studies indicate that south polar weather and currents have a great effect on many areas of both the Southern and Northern Hemispheres.	60-61

Chapter 2 / Section 3: NS2-M3C2S3 – Pacific Ocean

Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	62
Review Question	The Review Question is, "Which ocean resources do you think are the most valuable and why?" Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement and to foster discussion.	63
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	64
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	65

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handouts for in class and take home activities

When: The In-Class Activity should take place after the Pacific Ocean segment of the lesson.

- In-Class: Cadets complete the Pacific Ocean Sentence Activity. Have them share their completed sentences with a partner and compare and discuss their reason for answering the way they did.

B. Take Home Activity: Cadets are assigned to different groups. Each group takes one of the following topics and uses that topic to complete the 'Dear Mr. President' Activity.

- Atlantic Ocean
- Arctic Ocean
- Pacific Ocean
- Indian Ocean
- Mediterranean Sea and Black Sea
- Gulf of Mexico and the Caribbean Sea
- The Red Sea and Gulf of Aden
- Persian Gulf and Gulf of Oman
- Antarctica Seas/Southern Ocean

IV. Evaluation - see CPS database for chapter test questions.

Chapter 2 / Section 3: NS2-M3C2S3 – Pacific Ocean

Activity1: In Class Activity: Pacific Ocean Sentence Activity

Name: _____ Date: _____ Class: _____

Directions: Write a sentence that explains the importance of each location to U.S. interests in the Pacific Ocean.

San Diego:

Hawaiian Islands:

Japan:

China:

Russia:

South Korea:

Chapter 2 / Section 3: NS2-M3C2S3 – Pacific Ocean

Activity1: Take Home Activity: Dear Mr. President

Name: _____ Date: _____ Class: _____

Directions: (Use the topic you were assigned and fill in the blanks below)

The President of the United States has come to you and explained that the _____ will soon be closed to U.S. military operations and economic trading. Your task is to write a letter to the President explaining how crucial the _____ is to U.S. interests.

Dear Mr. President,

[illegible]

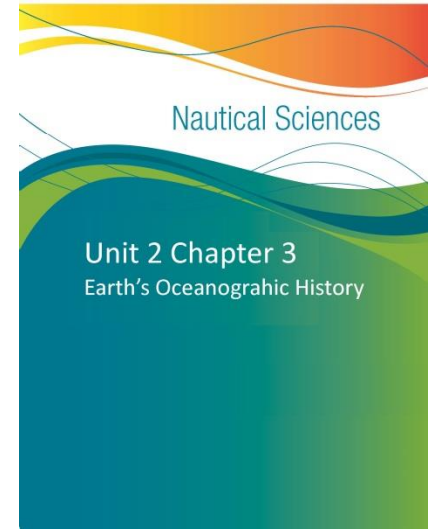
Module 3 Chapter 3: NS2-M3C3 – Earth’s Oceanographic History

What Students Will Learn to Do:

Illustrate an understanding of maritime geography as it relates to our national resources, landforms, climate, soil, bodies of water, people, governments, military and geopolitics

Skills and Knowledge to be Gained:

1. Explain four reasons for the great interest now being shown in the world’s oceans
2. Describe those historical events that created the great bodies of water
3. Describe the continental drift theory
4. Describe those great geological phenomena that occur today as a result of our changing Earth



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...
- RI.9-10.7. Analyze various accounts of a subject told in different mediums...

Writing

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products...
- W.9-10.8. Gather relevant information from multiple authoritative print and digital sources...

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Module 3 Chapter 3: NS2-M3C3 – Earth’s Oceanographic History

Dimension 2. Geography

- D2.Geo.2.9-12. Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their political, cultural, and economic dynamics.
- D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems...
- D2.Geo.5.9-12. Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.

Next Generation Science Standards (NGSS)

HS.Space Systems

- HS-ESS1-1. Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun’s core to release energy that eventually reaches Earth in the form of radiation.

HS.History of Earth

- HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.
- HS-ESS1-6. Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth’s formation and early history.

HS.Weather and Climate

- HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth’s systems result in changes in climate.

HS.Human Sustainability

- HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor’s Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor’s Guide.

Chapter 3 / Section 1: NS2-M3C3S1 – Earth’s Oceanographic History

(Section 1 of 1)

What Students Will Learn to Do:

Illustrate an understanding of maritime geography as it relates to our national resources, landforms, climate, soil, and bodies of water, people, governments, military and geopolitics

Skills and Knowledge to be Gained:

1. Explain four reasons for the great interest now being shown in the world’s oceans
2. Describe those historical events that created the great bodies of water
3. Describe the continental drift theory
4. Describe those great geological phenomena that occur today as a result of our changing Earth

LESSON FLOW OUTLINE

Unit Overview	Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	Formation of the Oceans (A)
Video1 Formation of the Oceans	Check On Learning A	Formation of the Oceans (B)	Video2 Formation of the Oceans	Formation of the Oceans (C)	The Earth's Structure	The Continental Drift Theory	Check on Learning B
The Earth's Crust Today (A)	Video The Earth's Crust Today	The Earth's Crust Today (B)	Review Questions	Closing Questions	Call for Other Questions		

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 3 / Section 1: NS2-M3C3S1 – Earth’s Oceanographic History

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 3. Place a checkmark beside the NS2-M3C3S1 PowerPoint presentation, and these two CPS question deck files:
NS2-M3C3S1 - Key Terms and NS2-M3C3S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Unit Overview	Explain that the Navy defines oceanography as the “application of the sciences to the phenomena of the oceans, including the study of their forms and their physical, chemical, and biological features.” Simply stated, oceanography is the scientific study of what happens on, in, and under the oceans of the world.	1-2
Unit Overview	Explain that greater attention is now being given to the oceans by nearly all nations, including the United States. The reasons for this are social, political, strategic, and economic.	3
Unit Overview	Explain that the coastal regions of our nation, which include estuaries, mouths of inland rivers and the Great Lakes, are major population and job centers. More than 40 percent of the U.S. population lives and works near the nation’s seacoasts. The coasts extend some 5,400 miles along the Gulf of Mexico and the Atlantic and Pacific Oceans, another 2,800 miles along the shores of the Great Lakes, and over 2,000 miles along the beaches of Hawaii, Guam, Puerto Rico, and the Virgin Islands.	4-8
Unit Overview	Explain that the oceans are rich with natural resources, food, and fuel. They are the “last frontier” for many vital materials on Earth.	9
Unit Overview	Explain that the oceans link the continents. The world ocean covers nearly 71 percent of Earth’s surface. It is a field for increased competition between industrialized nations. The world ocean provides the sea lines of communication over which commerce between the United States and many foreign nations takes place. Examples of political issues are trade and commerce, oil resources, fishing rights, and competition between industrialized nations.	10-11
Unit Overview	Explain that with over 84,000 miles of coastline and 40% of the nation’s population living and working near the seacoasts, the United States is a maritime nation. The oceans are vital to U.S. defense. The fleet of ballistic-missile submarines that operate in the oceans and their intercontinental missiles give the nation its most important deterrent against aggression by nuclear-armed nations around the world.	12

Chapter 3 / Section 1: NS2-M3C3S1 – Earth’s Oceanographic History

Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>We will discuss the aspects of oceanography and its importance to the world.</p> <p>We will explain four reasons for the great interest in the world oceans. We will discuss some of the social, economic, political, and strategic reasons why more and more nations are becoming interested in the seas.</p> <p>We will talk about the concept of the cosmology, the makeup of the Earth’s crust, and the continental drift theory. Finally, we will look at the great geological phenomena that occur today as a result of our changing Earth.</p>	13-15
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	16
Key terms - Definitions	Reinforce the correct definition for each key term.	17-25
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “List 2-3 things you know about volcanoes and recent eruptions around the world.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. The selected student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on an introduction to the Earth’s oceanographic history.	26
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	27
Introduction	Explain that it’s natural to wonder about the origin of the Earth and seas. Where did it all begin? How and why? A basic idea of how our planet Earth began is essential to our study of the life-giving seas. More about the scientific theory of the formation of the universe and the solar system is given in the Astronomy Unit (Unit 4) of this text.	28
Formation of the Oceans	Explain that modern science has given scientists a good idea of how Earth began. This study is a part of astronomy called cosmology or the science concerned with the nature of the universe and its origin. Scientists who study cosmology are called cosmologists.	29
Formation of the Oceans	Explain that cosmologists believe that what is now our solar system (the sun, the planets, and their moons) began about 4.5 billion years ago as a large cloud of gas and dust. Other systems are still developing today, including the Trifid nebula and Henzie 206 Nebula. Gradually, gravity and centripetal forces caused this cloud to spin and take the shape of a huge disk, with the sun in its center. From time to time, eddies, swirls, and collisions occurred in this disk, causing a number of smaller clusters of materials to separate and whirl in orbits around the large cluster forming the sun. One of these swirling masses became the planet Earth.	30-33

Chapter 3 / Section 1: NS2-M3C3S1 – Earth’s Oceanographic History

Formation of the Oceans	Explain that increased compression equals increased heat. Gravity and centripetal forces draw heavier metals (iron) toward the center core. Centrifugal force draws lighter material (silica) towards the outer edge.	34-35
Formation of the Oceans	Explain that after millions of years of increasing pressure and temperature, metallic crystals of iron and nickel melted and sank toward the core, or center, of the Earth. Because of the intense heat created within the Earth by compression, molten rock (magma) called lava often broke through the surface, either in large cracks in the Earth’s crust or in active volcanoes that expelled gases and solid materials.	36
Video 1 on the Formation of the Oceans	Show video 1 on the formation of the oceans.	37
Check on Learning Questions A (Lesson questions 3-4)	Check in on student’s understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	38
Formation of the Oceans	Explain that lava expels hydrogen and other gases water vapor and solid material.	39
Video 2 on the Formation of the Oceans	Show video 2 on the formation of the oceans.	40
Formation of the Oceans	Explain that the rays of the sun acted on the released gases and soon distributed them around the new planet to form an atmosphere. Meanwhile, the Earth continued to contract into a more solid mass, developing what is now the planet’s crust. The intense heat created by the compression of the Earth continued to cause thousands of volcanoes to bring lava and water vapor to the surface.	41-42
Formation of the Oceans	Radiation from the sun also continued to form Earth’s atmosphere by breaking up water molecules into separate atoms of hydrogen and oxygen. Because the hydrogen was lighter, much of it escaped into space, while the heavier oxygen atoms were retained in the atmosphere by gravity. Gradually, poisonous ammonia and methane gases in the atmosphere were dissipated by the sun as both it and Earth cooled. Slowly, the atmosphere cooled enough to cause the water vapor in the air to condense and return to the surface in the form of rain. Falling on Earth’s hot surface, some water hissed into steam, joined with new water vapor brought to the surface by volcanoes, and rose to be condensed and fall again and again as rain and, later, as snow.	43-45
Formation of the Oceans	Explain that this continuous precipitation (rain and snow) probably went on for thousands, maybe millions, of years. Finally, about 4 billion years ago, Earth had cooled to about its present size and temperature. Lighter granite (granitic rocks) had risen to higher elevations on the surface, and the heavier basalt (basaltic rocks) sank, creating high and low areas. Eventually most of the low spots in the crust filled with rainwater. These gigantic water pools eventually formed the world ocean—not in the same geographic shape we see the oceans today but, nevertheless, covering about 70 percent of Earth’s surface.	46
Formation of the Oceans	Explain that the cycle of evaporation and condensation continues today, though now only a small percentage of the vapor ascending into the atmosphere comes from volcanoes and other cracks in the Earth. Most of the water vapor today comes from the ocean surface and trapped groundwater, which is heated and recycled by the sun.	47

Chapter 3 / Section 1: NS2-M3C3S1 – Earth’s Oceanographic History

Formation of the Oceans	Explain that ours is a continually changing geologic world. However, these changes happen too slowly to be seen in the lifetimes of humans, except in instances of violent natural change, such as volcanic eruption or massive earthquake.	48
The Earth’s Structure	Explain that Earth is made up of several “shells,” somewhat like a golf ball. Earth’s core consists of two parts: a solid inner core of nickel and iron with a diameter of about 860 miles, and a molten outer core of these metals about 1,300 miles deep. Above this is about 1,800 miles of dense rock called the mantle. The uppermost layer of the mantle, several hundred miles thick, is called the asthenosphere. It is composed of molten rock called magma. The rigid outer crust, the lithosphere, “rides” or “floats” on this molten part of the mantle. The crust is Earth’s surface, the only part we can easily see. It consists of our continents and ocean basins. With an average depth of about 20 miles under continents, Earth’s crust may be as much as 40 miles deep beneath mountains. Under the oceans, however, it is only 3 to 10 miles thick.	49-50
The Earth’s Structure	Explain that the lithosphere, or Earth’s crust, is divided into six major plates and about a dozen smaller ones. The major plates are the American, African, Eurasian, Indo-Australian, Antarctic, and Pacific plates. Most of Earth’s volcanic eruptions and earthquakes occur on the boundaries or margins of these plates.	51
The Continental Drift Theory	Explain that it is not known how many times our planet’s plates have separated, come together, and separated again over the 4.5-billion-year geologic history of our planet. This movement of landmasses is known as continental drift. This theory was first seriously proposed in 1912 by Alfred Wegener. He based this theory on similar shapes, common fossils, and identical mineral formations that were found on both sides of the Atlantic. Many studies and modern oceanographic and geologic instruments have, in general, tended to confirm it. In the late 1960’s, the theory was modified to take into account all major geological structures of the Earth. The new theory is known as plate tectonics. Plates spread and ride over and under other plates creating new islands and mountains while recycling old sea bed to the mantle.	52-54
The Continental Drift Theory	Explain that according to the Continental Drift Theory, the hypothetical super-continent Pangaea included all of the land masses of the earth. About 225 million years ago, the continental drift broke Pangaea into Laurasia and Gondwanaland. 200 million years ago, these contents would break into North America, Europe, Asia, India, Australia, Africa, South America, and Antarctica.	55
The Continental Drift Theory	Explain that 135 million years ago, Laurasia and Gondwanaland broke apart even further, and India moved northward. 64 million years ago, North and South America drifted westward creating the Sierra and Andes mountains. Africa created the Pyrenees Alps and the Apennines were created in southern Eurasia. By present day, Australia was completely separated from Antarctica, and India was creating the Himalayas. The Earth’s evolution continues today with the seas providing vital links.	56-57
Check on Learning Questions B (Lesson questions 5-6)	Check in on student’s understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	58
The Earth’s Crust Today	Explain that the evolutionary process just discussed created a global jigsaw puzzle of segments known as geological plates. The plates drift over the asthenosphere. Where these plates come together, Earth and its inhabitants experience the incredible energy of earthquakes and volcanoes. Seismographs, modern instruments that measure the intensity of earthquakes, have helped to locate the boundaries of the plates, called fault lines. Also, along these boundaries, mountains rise and fall and volcanic islands push up from the sea. The energy released in the explosion of a nuclear bomb is small compared with these huge geologic forces.	59-61

Chapter 3 / Section 1: NS2-M3C3S1 – Earth’s Oceanographic History

The Earth’s Crust Today	Explain that the best known fault line in the U.S. is the San Andreas Fault in California, caused by the Pacific Plate moving North and the North American Plate moving South.	62-63
Video on the Earth’s Crust Today	Show video on the Earth’s crust today.	64
The Earth’s Crust Today	Explain that in the United States, the entire West Coast is in an earthquake “belt.” The best-known feature of this belt is the San Andreas Fault, which runs through the center of California and close to San Francisco. In fact, some geologists predict that all of Baja California and much of the present state of California may someday break away from the North American continent and drift toward Alaska, arriving there in about 50 million years! Explain that not all such catastrophes will happen in the distant future. In fact, many earthquakes occur daily. Tokyo, Japan, for example, often experiences two to three tremors each day. Fortunately, few are ever felt by people, though sensitive seismographs do record several hundred quakes each year.	65
The Earth’s Crust Today	Explain in 1902, Mount Pelée, a volcano near St. Pierre on the Caribbean Island of Martinique, erupted with an earthquake and superheated gases that killed 30,000 people within seconds. In 1906 San Francisco was almost totally destroyed by a large quake on the San Andreas Fault. Within the past ten years, devastating quakes have killed thousands of people in Italy, Iran, Pakistan, Turkey, Greece, Guatemala, Nicaragua, Mexico, and the former Soviet Union. Another less serious but widely reported quake disrupted the baseball World Series in October 1989 in San Francisco, causing much damage and at least sixty-three confirmed deaths.	66-67
The Earth’s Crust Today	Explain that Eastward, as the Indian Plate pushed north into the Eurasian Plate, deadly earthquakes occurred during the construction of the world’s newest and highest mountains. In November 2002, Pakistan experienced a 5.6 quake with few deaths, but for an October 2005 magnitude 7.6 quake, estimates reached 75,000 - 85,000.	68-69
The Earth’s Crust Today	Explain that the largest disaster of all time from a single earthquake occurred in 1976 in Tangshan, China, when almost 700,000 people were reported to have been killed.	70
The Earth’s Crust Today	Explain that when an earthquake or volcanic explosion happens near or under the sea, ocean waves radiate from it in ever-widening circles.. These huge waves are called tsunami, a Japanese word that means “surging walls of water.” These fantastic walls of water can race across the deep oceans at jet-plane speeds of 450 miles per hour but then slow to 25–30 mph in coastal waters. Tsunami are often incorrectly called tidal waves, but they have no relationship to the tides at all. There may be little movement detected on the open sea, but as these waves reach shallow waters along coastlines, the waves slow and pile up in huge crests, sometimes more than 100 feet high.	71-72
The Earth’s Crust Today	Explain that Tsunamis build as the sea floor rises. A rapidly emptying shoreline often precedes a tsunami. Observers should move away to higher ground immediately. As the Pacific Plate spreads, converges, and passes under other plates, great trenches and volcanoes form. Sudden slippage of passing plates at the trenches creates earthquakes (seaquakes) and tsunamis.	73-75
The Earth’s Crust Today	Explain that the Hawaiian Islands, Alaskan coast, and western Pacific areas are periodically lashed by tsunami, which have caused great loss of life. The worst tsunami in history occurred in December 2004, when an earthquake under the Indian Ocean generated a huge wave that devastated seacoast areas throughout the region.	76-79

Chapter 3 / Section 1: NS2-M3C3S1 – Earth’s Oceanographic History

	While the greatest devastation occurred near the epicenter, the tsunami killed as far away as Somalia and Madagascar. By some estimates, 370,000 people lost their lives in Indonesia, Sri Lanka, Thailand, southern India, and other countries. Explain that the devastation prompted a worldwide humanitarian response, including a large relief effort by the U.S. Navy.	
The Earth’s Crust Today	Explain that tsunamis in the North Pacific’s “Ring of Fire” have occurred throughout recorded history. As the world’s coastal population increases, deaths from tsunamis initiated by seaquakes are inevitable.	80
The Earth’s Crust Today	Explain that other significant historical tsunami in the western Pacific include a 120-foot high wave caused by the explosion of the volcanic island Krakatoa that killed 36,000. Dirty rain from Krakatoa orbited the Earth for many years. Other tsunamis included an 1896 tsunami that killed 27,000 people in Japan and wrecked 7,000 fishing boats, and one in 1976 that caused over 5,000 deaths in the Philippines.	81-82
The Earth’s Crust Today	Explain that on March 11, 2011 a 9.0 magnitude earthquake occurred 231 miles northeast of Tokyo, Japan, and caused a tsunami with 30 ft waves. It was the fourth largest earthquake on record (since 1900) and the largest to hit Japan. Between the earthquake, the aftershocks and the tsunami waves, three of the six Fukushima Daiichi plant’s nuclear reactors were damaged. The death toll rose to 15,884 and material damage from the earthquake and tsunami was estimated at about \$300 billion. An estimated 100 metric tons of radioactive water leaked from a holding tank at the Nuclear Power Plant. The Japanese government estimates that the tsunami swept about five million tons of debris offshore, but that 70 percent sank, leaving 1.5 million tons floating in the Pacific Ocean.	83
Review Question	The Review Question is, “Discuss the most famous earthquake belt in the United States.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	84
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	85
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	86

Chapter 3 / Section 1: NS2-M3C3S1 – Earth’s Oceanographic History

III. Supplemental Activities -

A. In Class Activity:

Supplies required: World map to project on the screen, provided in the handouts and handout for take home activity.

When: This activity should take place at the beginning and at the end of the lesson.

- In-Class: To introduce the lesson, ask cadet’s the following questions and make a record of their answers that can be accessed later. Have a copy of a world map on the projector, overhead or paper copy.
 1. How many continents are there?
 2. What separates the continents?
 3. What do you notice about the shape of the continents?
 4. How do islands form?
 5. How do mountains form?
 6. Why do some animals live on some continents, but not on others?
- Once the lesson is complete, bring back these initial responses and correct any misconceptions that cadets had at the beginning

B. Take Home Activity: copy and distribute the handout “Earthquakes, Volcanoes, or Tsunami”

Students are given one of the following: earthquakes, volcanoes, or tsunami. They are to create a pamphlet, individually or in a small group, that provides information about the topic they were assigned. The pamphlet should include information on how their topic is formed, key vocabulary words needed to understand their topic and historical examples. Word and illustrations should be used in the pamphlet.



Tech Tip: Annenberg Learner has a fabulous interactive site that covers the earth’s structure, plate tectonics, etc. This would be a wonderful resource to use as a class or to have students access on their own devices.

<http://www.learner.org/interactives/dynamicearth/structure.html>

IV. Evaluation - see CPS database for chapter test questions.

Chapter 3 / Section 1: NS2-M3C3S1 – Earth's Oceanographic History



Chapter 3 / Section 1: NS2-M3C3S1 – Earth’s Oceanographic History

Activity 1: Take Home Activity – Earthquakes, Volcanoes, or Tsunami

Name: _____ Date: _____ Class: _____

Directions: Based on the topic you have been given: earthquakes, volcanoes, or tsunami, create a pamphlet that provides information about the topic you were assigned. The pamphlet should include information on how your topic is formed, key vocabulary words needed to understand your topic and historical examples. Word and pictures should be used in the pamphlet. Use this sheet to organize your ideas.

Module 3 Chapter 4: NS2-M3C4 –Undersea Landscapes

What Students Will Learn to Do:

Demonstrate an understanding of the significance of oceanographic study

Skills and Knowledge to be Gained:

1. Explain methods used to explore the ocean floor
2. Describe the benefits of the continental shelf
3. Describe the make-up of the continental slope
4. Explain the features of the deep ocean basin
5. Describe the sediments found on the ocean floor

Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...

Writing

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.3. Write narratives to develop real or imagined experiences or events...
- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...

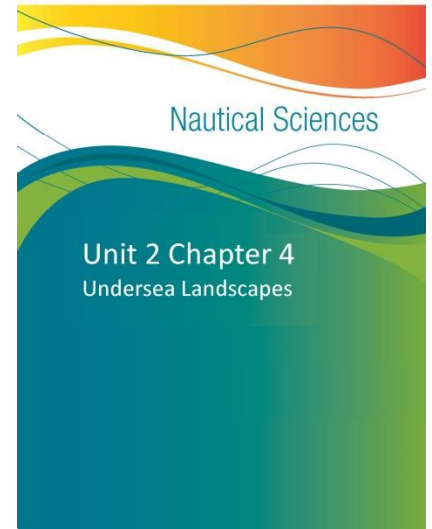
Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Geography

- D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them.



Module 3 Chapter 4: NS2-M3C4 –Undersea Landscapes

- D2.Geo.5.9-12. Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.
- D2.Geo.11.9-12. Evaluate how economic globalization and the expanding use of scarce resources contribute to conflict and cooperation within and among countries.

Dimension 2. History

- D2.His.2.9-12. Analyze change and continuity in historical eras.

Next Generation Science Standards (NGSS)

HS.History of Earth

- HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.
- HS-ESS1-6. Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history.

HS.Earth's Systems

- HS-ESS2-2. Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.
- HS-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.
- HS-ESS2-7. Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 4 / Section 1: NS2-M3C4S1 – Undersea Landscapes

(Section 1 of 1)

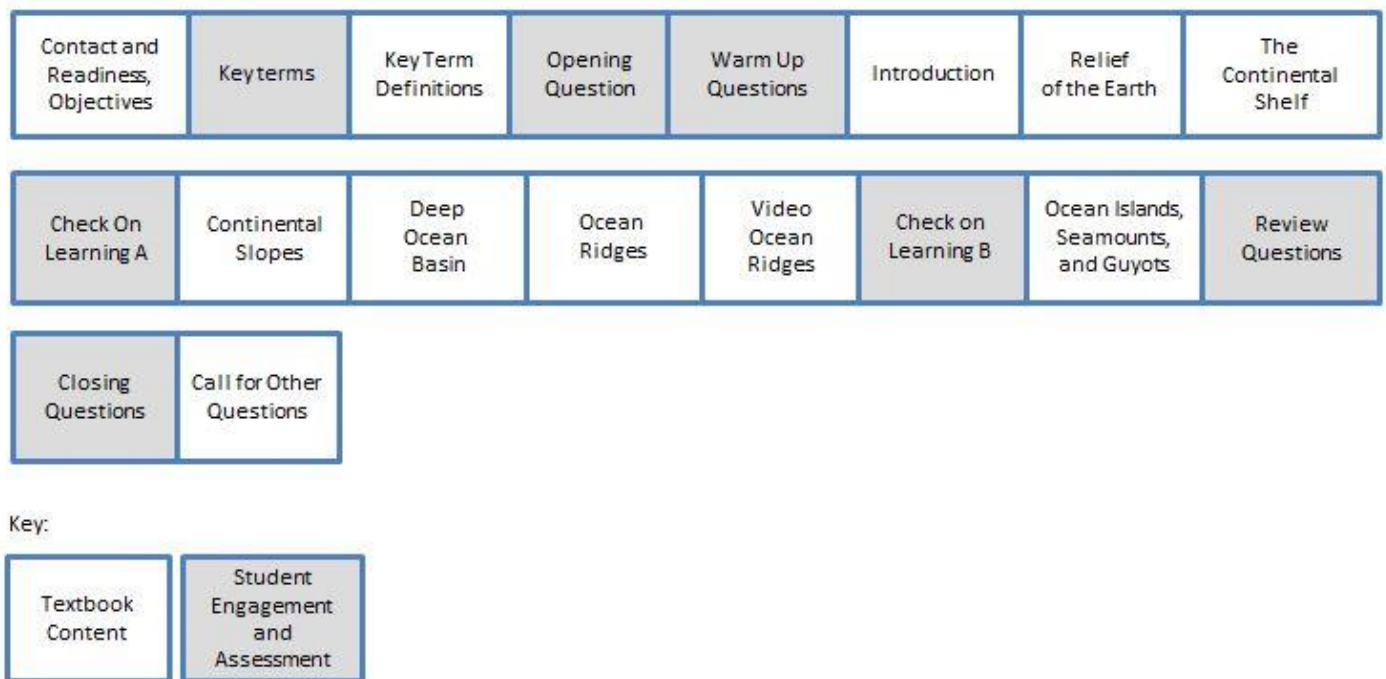
What Students Will Learn to Do:

Demonstrate an understanding of the significance of oceanographic study

Skills and Knowledge to be Gained:

1. Explain methods used to explore the ocean floor
2. Describe the benefits of the continental shelf
3. Describe the make-up of the continental slope
4. Explain the features of the deep ocean basin
5. Describe the sediments found on the ocean floor

LESSON FLOW OUTLINE



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 4. Place a checkmark beside the NS2-M3C4S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C4S1 - Key Terms and NS2-M3C4S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 4 / Section 1: NS2-M3C4S1 – Undersea Landscapes

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will talk about the landscape under the sea. It will be an exciting journey. We will discuss the continental shelf and the life it supports, the continental slope where the deep sea truly begins, and the deep ocean floor - the “last frontier” on Earth. We will learn how sounds are used to study and chart underwater topography and how samples have been brought up from 4,000 feet beneath the ocean floor. We will talk about the contributions our Navy has made to the study of oceanography.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-11
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Name 2-3 reasons why the U.S. maintains an active ocean research program.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the introduction to undersea landscapes.	12
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	13
Introduction	Explain that for many centuries people believed that the sea floor was simply a deep, smooth basin with a bottom covered with oozy mud. In fact, until the twentieth century, most knowledge of the ocean floor came from the ancient method of heaving a lead-weighted line overboard in shallow water and looking at the mud, weeds, and sediments that clung to the weights when retrieved.	14-16
Introduction	Explain that U.S. Navy scientists searched for submarines during World War I to combat German successes. This led to both the hydrophone (listens passively) and the echo sounder (sends signals and listens for echo). Searching for submarines in North America, oceanographers really began to understand that the ocean bottom has just as varied geography as the land surface. From that time onward, an intense effort to chart the sea floor has taken place.	15-16

Chapter 4 / Section 1: NS2-M3C4S1 – Undersea Landscapes

Relief of the Earth	Explain that the relief of the Earth refers to the different elevations and form of its surface, called its topography. A relief map, for instance, shows the different heights of a part of the Earth's surface by use of shading, colors, or numbered contour lines (lines provide elevations while spacing indicates relative slopes).	17-19
Relief of the Earth	Explain that there are two main levels in the relief. These are the continents, or continental terraces, including land masses and continental margin, and the deep ocean floor. The deep ocean floor is also called the deep sea, the deep ocean basin, or the abyss.	20
Relief of the Earth	Explain that the continental margin is made up of the continental shelf, the continental slope, and conditionally the continental rise. The deep sea floor is described in terms of the individual features comprising it, such as abyssal plains, oceanic ridges, sea floor fractures, deep-sea trenches, islands, and seamounts.	21
Relief of the Earth	Explain that depth soundings are described in terms of individual features. Though approximately 70 percent of Earth's surface is covered by water, only two-thirds of that is truly deep oceanic basin. The basin has an average depth of about 12,000 feet (about 2 to 21/2 miles), but there are regions over 7 miles deep.	22-23
Relief of the Earth	Explain that echo sounders (sometimes called fathometers) provide a rapid means of finding the depth of water over which a vessel is traveling. They measure the time it takes sound pulses to travel from the vessel on the surface to the ocean floor and return as echoes. Echoes that bounce back quickly indicate a shallow bottom or perhaps the top of an undersea mountain. Echoes that take longer indicate deeper water, such as a deep mid-ocean trench. On average, sound travels 4,800 feet per second in water. If an echo takes three seconds to return, then the sound has traveled three times 4,800 feet, or 14,400 feet. Since it is a round trip, half that distance would be the depth of the water—in this case, 7,200 feet."	24-25
The Continental Shelf	Explain that echo soundings have determined that the ocean floor is divided into three distinct areas: the continental shelf; the deep ocean basin, or abyss; and lying between them, the continental slope.	26
The Continental Shelf	Explain that the continental shelf borders the continental land areas. Actually, the margins of the continents are submerged below the sea water. The sea, it can be said, spills over the brims of the ocean basins, covering the continental shelves with relatively shallow water. Most maritime nations of the world have agreed that, in a legal sense, the continental shelf is a part of the land out to a depth of 200 meters (about 656 feet). In that shelf area the rights of exploration and use of resources belong to the adjacent continental nation according to international law.	27
The Continental Shelf	Explain that the continental shelf is a gradually sloping sea bottom surrounding all continents on Earth. The shelf generally drops about 7 to 10 feet every mile. The average width of the continental shelves is about 42 miles. Off the shores of parts of North Carolina the shelf extends out to about 75 miles. In the Barents Sea off the Arctic coast of Russia it extends 800 miles, and off the coast of California it is less than a mile in width. In some areas of the world such as Peru and Japan, there is virtually no continental shelf, the plunge begins almost immediately.	28-30
The Continental Shelf	Explain that the shelves are not always smooth, gradual slopes. The shelves vary from smooth plains to irregular, rough terrain. Many types of sediment, such as rocks, sand, mud, silt, clay, and gravel, cover the shelves. The most common material is coarse sand, consisting mainly of particles carried away from the continental landmass and deposited by rivers, currents, ice, and wind during the ice age.	31
The Continental	Explain that biologically, the continental shelves are sunlit areas that support most of	32

Chapter 4 / Section 1: NS2-M3C4S1 – Undersea Landscapes

Shelf	the sea vegetation and saltwater fishes and animals on Earth. Even today, our knowledge about the ocean is mostly limited to the continental shelf regions. It is here that most fishing is done. Exploration for, and production of oil and other minerals is done almost entirely on the continental shelves. It is here that nations are most likely to confront one another as their growing populations increase demands for fuels, minerals and food.	
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	33
Continental Slopes	Explain that beyond the continental shelf, no matter how far from the land, the bottom sharply drops off. The dramatic descent is called the continental slope. Here is where the deep sea truly begins. Oceanographers and geologists have found that the continental slopes generally drop from 100 to 500 feet per mile, but with increasing depth they tend to flatten out and merge into the deep ocean floor. This is where the continental crust of granitic rocks ends and the bottom drops off to the sediments on the ocean floor, which has a base of basaltic rock.	34-35
Continental Slopes	Explain that granitic rock is hard and is either speckled white or grey in color with a rough appearance. Granitic rock is created from magma cooling slowly under the Earth's surface. It is the most common rock exposed on the surface. Basaltic rock is hard and dark in color. The rock is smooth to glossy in appearance. This rock is created from lava cooling rapidly above the Earth's surface. It is the most common rock on the Earth's crust, covering the oceanic crust's floor. Granite is lighter relative to basalt and rises to mountainous heights, often with volcanic activity created by the intense pressure.	36-37
Continental Slopes	Explain that humans find the deep ocean floor a bleak and uncomfortable world. There is no light and no plant life. The pressure, cold, and silence increase as one descends. The bottom sediments are mainly mud and clay, with small amounts of sand and gravel. There may be rocks in areas with active volcanoes. In some areas, the sharp incline of the slope is dramatic, as along the western coast of South America where there is an 8-mile descent from the top of the Andes Mountains to the bottom of the Peru-Chile Trench at a horizontal distance of less than 100 miles.	38-39
Continental Slopes	Explain that the continental slopes have some of the most rugged features on Earth. They are scarred with spectacular features including submarine canyons, steep cliffs, and winding valleys. Some places have terraces and plateaus, while others have sheer drop-offs of several thousand feet.	40
Continental Slopes	Explain that submarine canyons in the continental slope are similar to canyons found in the southwestern United States. They are often carved out of the shelf and slope by past glaciation, tidal currents, other underwater currents, and landslides. Rapidly moving underwater currents carrying debris and sediments are called turbidity currents. They scour the canyon walls much like river or wind erosion does on continental surfaces.	41
Continental Slopes	Explain that some submarine canyons are much larger than the Grand Canyon of Arizona. The Hudson Canyon in the western North Atlantic, for example, extends from waters with a depth of 300 feet at the canyon head, 90 miles southeast of New York Harbor, to a depth of 7,000 feet some 150 miles offshore. The 50-mile-long canyon is 4,000 feet deep in places and has a number of large tributaries entering it. It cuts through the continental slope and joins a low spot in the continental shelf that marks the entrance of the Hudson River channel off New York Harbor. The Hudson Canyon is continuously scoured by currents containing large amounts of silt coming out of the	42-45

Chapter 4 / Section 1: NS2-M3C4S1 – Undersea Landscapes

	Hudson River. The silt is eventually deposited on an enormous plain of mud called a submarine fan which forms from mud, silt, and other sediment deposited when rivers empty into the ocean. Similar fans extend hundreds of miles out to sea. These submarine fans may also deposit enough sediment to create deltas above the surface.	
Continental Slopes	Explain that a continental rise occurs where turbidity currents deposit enough sediment at the base of the continental slope to change angle of the slope.	46
Deep Ocean Basin	Explain that the ocean floor lies at the foot of the continental slope and is the true bottom of the ocean. The deep ocean floor extends seaward from the continental slope and takes up one-third of the Atlantic and Indian Oceans and three-quarters of the Pacific Ocean. The abyss is considered the “last frontier” of exploration Earth.	47-49
Deep Ocean Basin	Explain that oceanographers have determined that most of the Pacific deep ocean basin consists of hills forming a rough topography, while plains are widespread in the Atlantic. All these plains are connected by canyons or other channels to sources of sediments on land. These sediments are transported by turbidity currents down the slope to be deposited on the plains. Heavier sediments create the rise and lighter sediments settle on the plains.	50-51
Ocean Ridges	Explain that every deep ocean floor has impressive mountain ranges called ridges. The great Mid-Atlantic Ridge soars more than 6,000 feet above the nearby sea floor in some places, and rises above the surface to form islands such as the Azores and Iceland. It extends from north of Iceland to below the tip of South Africa.	52-53
Video on Ocean Ridges	Show video on ocean ridges.	54
Ocean Ridges	Explain that the Mid-Atlantic Ridge continues around Africa and joins the Mid-Indian Ocean Ridge coming down from the Arabian Peninsula. The Mid-Indian Ridge continues eastward south of Australia and New Zealand, joining the East Pacific Rise.	55
Ocean Ridges	Explain that the East Pacific Rise is the main underwater feature in the southern and southeastern Pacific Ocean. Located about 2,000 miles from the west coast of South America, it runs northward to the peninsula of Baja California. The whole 40,000-mile-long mountain chain is sometimes given a single name, the Mid-Ocean Ridge, although it is somewhat off center in the Pacific. Many underwater earthquakes occur in a rift running down the ridge’s centerline. A rift is a deep fracture or break in the Earth’s crust creating an elongated valley bonded by two or more faults. Large portions of the major plate margins of Earth’s surface lie along the centerline of the Mid-Ocean Ridge.	56-59
Check on Learning Questions B (Lesson questions 5-6)	Check in on student’s understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	60
Ocean Islands, Seamounts, and Guyots	Explain that almost all true oceanic islands are volcanic in origin. They differ from island fragments that have broken away from continental masses, such as New Zealand, New Guinea, and Greenland. Almost all of the small islands of the Pacific are oceanic islands—the tops of former volcanic mountains. When erosion has worn away much of a volcanic peak in the ocean, a strand of coral islands is left around the old volcanic rim. This formation is known as an atoll. The central lagoon of the atoll is what remains of the old volcanic crater.	61-62
Ocean Islands, Seamounts, and Guyots	Explain that in some cases, these coral islands continue to subside and finally disappear beneath the sea surface, leaving what is known as a seamount. Many strings of seamounts dot the floor of the central Pacific, the ancient remains of former islands. They are found in all oceans but are most common in the Pacific Ocean.	63

Chapter 4 / Section 1: NS2-M3C4S1 – Undersea Landscapes

Ocean Islands, Seamounts, and Guyots	Explain that scattered underwater mountains with peaks that never reached the surface retain the name seamounts. Accurate seamount location and charting is critical in navigation. In January 2005 S.S.N. <i>San Francisco</i> collided with such a seamount. Seamounts with flattened tops are called Guyots and are only found in the Pacific.	64-66
Ocean Islands, Seamounts, and Guyots	Explain that the Hawaiian Islands are part of a 3,200 mile volcanic island chain that was created by volcanic eruption as the Pacific Plate moves northwest. They include seamounts, and guyots stretching northwest toward the Alaskan Archipelago.	67-68
Ocean Islands, Seamounts, and Guyots	Explain that southeast of the big island of Hawaii, the newest seamount, Loihi, is actively building to become the next island. Spectacular lava eruptions are regular occurrences from a number of famous volcanoes in the islands. Kilauea and Mauna Loa on the big island of Hawaii are two of the world's most active volcanoes. Mauna Loa lifts its head 13,677 feet above the blue waters of the Pacific and is high enough to have snow when dormant. But this is less than half of its real height, for from its base on the sea floor to its lava-covered summit, Mauna Loa measures more than 31,000 feet. Other island chains of this type include the Caroline, Gilbert, Samoan, and Society Islands.	69-72
Review Question	The Review Question is, "Describe the sequence of events in the "wearing down" process of an oceanic island." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	73
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	74
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	75

III. Supplemental Activities –

A. In Class Activity:

Supplies required: Handouts for in class and take home activities

When: This activity should take place at the end of the lesson.

- In-Class: Cadets will complete the "Help Wanted" activity.

B. Take Home Activity: Using graph paper, cadets will create a realistic representation of the sea floor. Their model should show sloping, dipping and rising. The graph paper lines should be used to measure realistic depths and a horizontal line is to be drawn to show the top of the ocean. Cadets should label their model with Continental Slope, Continental Rise, Continental Shelf and abyss.

*To conclude, cadets will write a paragraph explaining their model.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 4 / Section 1: NS2-M3C4S1 – Undersea Landscapes

Activity 1: In Class Activity: HELP WANTED!

Name: _____ Date: _____ Class: _____

Directions:

You are in charge of studying an uncharted portion of the ocean and you need help. In the space below, write a want ad advertising for someone to be on your research team. What skills will they need? What jobs will they perform? What will you be looking for? What do you hope to learn? What equipment will be used? Describe the personal qualities of the assistant that you are seeking.

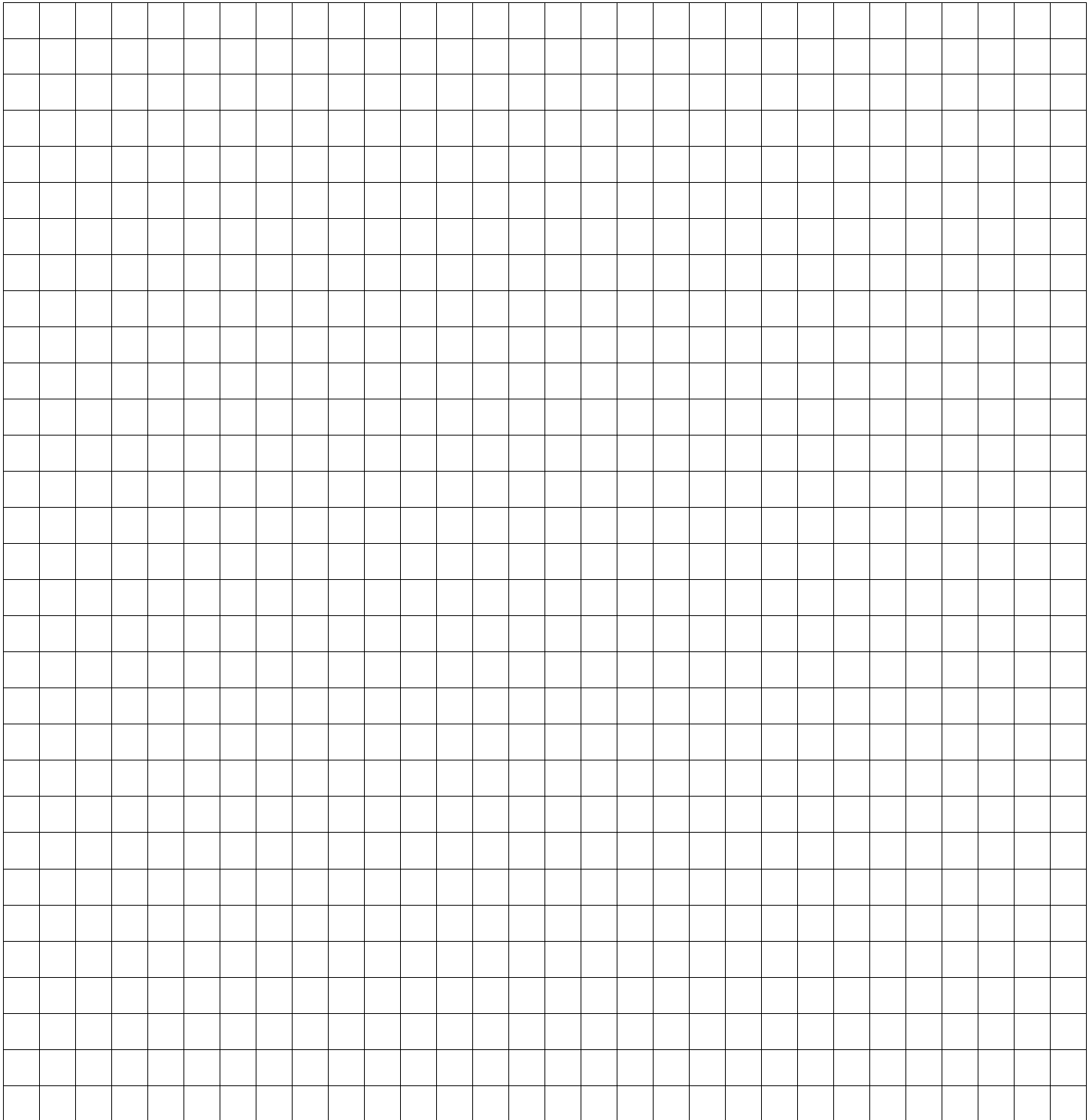
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Chapter 4 / Section 1: NS2-M3C4S1 – Undersea Landscapes

Activity 1: At Home Activity: Ocean Graph

Name: _____ Date: _____ Class: _____

Directions: Create a realistic representation of the sea floor. Your model should show sloping, dipping and rising. The graph paper lines should be used to measure realistic depths and a horizontal line is to be drawn to show the top of the ocean. Label your model with Continental Slope, Continental Rise, Continental Shelf and abyss. Next, write a paragraph explaining their model.



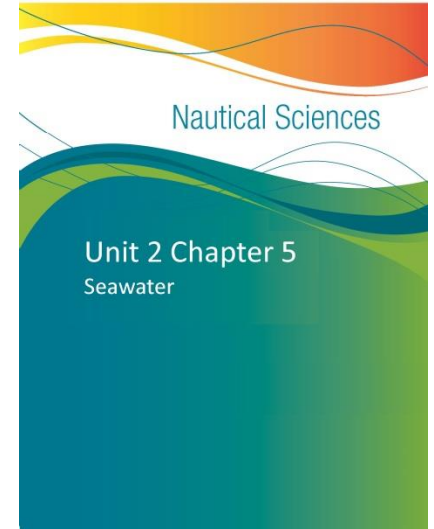
Module 3 Chapter 5: NS2-M3C5 –Seawater – Makeup & Movements

What Students Will Learn to Do:

Demonstrate an understanding of the significance of oceanographic study

Skills and Knowledge to be Gained:

1. Describe the chemical makeup of water
2. Explain the physical properties of water
3. Describe the composition of water
4. Describe how water temperature is measured
5. Describe environmental effects on the color of water
6. Describe the causes of waves
7. Describe how wave movement is measured
8. Cite the causes of beach and coastline erosion
9. Describe the effects of wave power
10. Cite the causes of ocean currents and gyres
11. Describe the current movement in the Pacific Ocean
12. Explain three effects of subsurface or countercurrents
13. Explain the effects of the Moon on our tides
14. Describe the effects of tides on coastal areas
15. Describe the theory of tidal energy



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.7. Analyze various accounts of a subject told in different mediums (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account.
- RI.9-10.8. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.

Writing

- W.9-10.1. Write arguments to support claims in an analysis of substantive topics or texts...
- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products...

Speaking & Listening

- SL.9-10.2. Integrate multiple sources of information presented in diverse media or formats ...
- SL.9-10.3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric...
- SL.9-10.5. Make strategic use of digital media in presentations...

Module 3 Chapter 5: NS2-M3C5 –Seawater – Makeup & Movements

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Geography

- D2.Geo.2.9-12. Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their political, cultural, and economic dynamics.
- D2.Geo.7.9-12. Analyze the reciprocal nature of how historical events and the spatial diffusion of ideas, technologies, and cultural practices have influenced migration patterns and the distribution of human population.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...

Next Generation Science Standards (NGSS)

HS.History of Earth

- HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.
- HS-ESS1-6. Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth’s formation and early history.

HS.Weather and Climate

- HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth’s systems result in changes in climate.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor’s Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor’s Guide.

Chapter 5 / Section 1: NS2-M3C5S1 – The Makeup of Seawater

(Section 1 of 3)

What Students Will Learn to Do:

Demonstrate an understanding of the significance of oceanographic study

Skills and Knowledge to be Gained:

1. Describe the chemical makeup of water
2. Explain the physical properties of water
3. Describe the composition of water
4. Describe how water temperature is measured
5. Describe environmental effects on the color of water

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	What is Water	Physical Properties of Water
Check On Learning A	Salts of the Seas	Check on Learning B	Water Temperature	Sunlight and Water	Review Questions	Closing Questions	Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 5. Place a checkmark beside the NS2-M3C5S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C5S1 - Key Terms and NS2-M3C5S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 5 / Section 1: NS2-M3C5S1 – The Makeup of Seawater

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will discuss the chemical makeup of water, along with the physical properties and its composition. We will talk about the composition of seawater. While we tend to think of seawater as being very salty, it really isn't. In most areas it is only 35 parts salt to 1,000 parts seawater. There are some lakes with a much higher salt content. We will discuss them, plus we'll see how oceanographers are able to measure the salinity of seawater. We will finish the lesson talking about the physical properties of water, the tides, waves, and currents, and their effects on the land areas of the Earth.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-8
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "Describe what you know about the process of evaporation." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on the introduction to seawater.	9
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	10
Introduction	Explain that people have asked these questions for centuries. Matthew Fontaine Maury of the U.S. Navy, who is regarded as the founder of modern oceanography, greatly increased our knowledge of the oceans through his studies from 1842 to 1861 of navigational charting and of currents, winds, and storms.	11
What is Water?	Explain that since then, much has been learned about the oceans, but with each new bit of information, more questions arise. The seas are not only beautiful and interesting but also absolutely essential to the very existence of mankind. In addition to the untold wealth beneath their surface and within their sea beds, the seas make life possible on our planet.	12
What is Water?	Explain that water is one of the most abundant, widely distributed, and essential substances on the surface of the Earth. It is an essential requirement for the cells of	13

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	humans, other animals, plant life, and even crystals of many minerals. Water has many forms. Ice is water in solid form, clouds (and steam) are water in vapor form, and water in liquid form is a lake, river, or ocean.	
What is Water?	Explain that snow is most likely the most pure, natural source of water. Rain is next in purity, although both snowflakes and raindrops are formed with a tiny nucleus of salt or dust. Pure water is a compound of two parts hydrogen and one part oxygen. In chemical terms, this is expressed as H ₂ O. Only when water is between the temperatures of 32 degrees and 212 degrees Fahrenheit (0 to 100 degrees Celsius) at standard atmospheric pressure is it a liquid.	14
Physical Properties of Water	Explain that in large part, the special characteristics of water make life on Earth possible. For instance, most materials expand when heated and contract when cooled. Water, however, contracts until cooled to about 4 degrees Centigrade (39.2 degrees Fahrenheit) but then expands rapidly as it freezes, increasing in volume about 9 percent. For example, a milk carton filled with water and placed in a freezer will expand greatly and may split. A glass bottle will shatter as the ice expands beyond the capacity of the bottle to contain the ice.	15
Physical Properties of Water	Explain that if this unique expansion did not take place, ice would sink in water, causing water to freeze from the bottom up. However, as we all know, ice cubes float. More importantly, ice floats on the surface of the ocean, a lake, or a pond and serves as an insulating barrier, holding the heat in the water below. If this were not so, much of Earth's oceans would likely be ice most of the time, and life as we know it may have evolved very differently.	16
Physical Properties of Water	Explain that another quality of water is its ability to store heat. Only ammonia has a greater heat storage capacity than water. Land, on the other hand, absorbs and loses heat quickly. If the globe were completely land, as is the moon, it would be scorching hot every day and freezing cold every night. Not many life forms could survive under these conditions. The vast world ocean, however, acts as an enormous heat-controlling thermostat. It absorbs and loses heat more slowly than the land nearby. Also, because of the great currents in the sea, the ocean can absorb heat in one area and then transfer the heat to other areas where portions of heat are released.	17-18
Physical Properties of Water	Explain that those who live near the seacoasts or the Great Lakes are well aware of this characteristic of water. In summer, weather air temperatures are cooler near the coast than they are farther inland, where the sun quickly heats the ground. In winter, because the water retains heat longer, the exact opposite happens. It is warmer near the coast and colder farther inland.	19
Physical Properties of Water	Explain that except under extreme pressure, such as at great ocean depths or under laboratory conditions, water is not compressible. That is, a given amount of water cannot be made smaller in cubic volume. On the other hand, this liquid can be stirred or mixed easily. The molecules will readily associate with each other and retain its liquid form. This means that water can "turn over," allowing the heat from the surface to move into deeper depths, colder water to move to the surface, and water to evaporate from the surface, aided by wind and wave action. These processes of absorption and evaporation are vital to the pattern of world climate and to the transfer of heat from equatorial to polar regions.	20-21
Physical Properties of Water	Explain that water affects sound and light in important ways, too. The speed of sound in water, for example, is very much greater than in air and increases with temperature, pressure, and salinity (salt content). Of these factors, temperature is by far the most important in affecting the velocity of sound. The optical properties (ability to transmit light) of seawater are of fundamental importance to life in the oceans.	22-23

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Physical Properties of Water	Explain that there are many other fascinating facts about water. Besides being essential to all animal and plant life, it is also widely used in science and industry as a solvent, as a blending agent, and even as a standard for certain physical properties. The reference points of most thermometers, for example, are the freezing and boiling points of water. Water is also used as a coolant, a dilatant, a cleansing medium, and in the production of heat and power.	24
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	25
Salts of the Seas	Explain that chemically, seawater is a very pure substance. It is more than 95 percent water, that is, hydrogen and oxygen. About eighty elements are found in the solution or suspension in the remaining 5 percent. The two basic elements in this remaining portion are sodium and chlorine, which combine to become common table salt. The most significant of the other elements in seawater in concentrations greater than one part per million, or one milligram per liter, are sulfate, magnesium, calcium, and potassium. The remaining elements are present in extremely small amounts.	26-27
Salts of the Seas	Explain that the total, salt in seawater is expressed in parts per thousand. Ocean salinity varies between 32 and 37 parts per thousand (3 to 4 percent by volume), with open ocean waters usually about 35 parts per thousand. (That is, if a seawater droplet were divided into 1,000 tiny parts, there would be 965 parts of water and 35 parts of salt.) Enclosed basins and seas have higher salt concentrations. For example, the Mediterranean Sea has about 38.5, and some areas of the Red Sea, particularly during the summer months, have salinities as high as 41 and are the highest salinity values in the world ocean. Landlocked lakes that serve as basins for water running off surrounding land, such as the Great Salt Lake of Utah or the Dead Sea of Israel, with salinities of 250 and 350 respectively, have the highest salt content of any bodies of water on Earth.	28-30
Salts of the Seas	Explain that in fact, the salts of the ocean are the result of over 2 billion years of wearing away of the rocks of Earth's crust. Those materials that are soluble (can be dissolved) remain in the ocean water. Insoluble materials fall to the bottom and form sediments and clays that may eventually turn into sedimentary rocks. Though the process continues, much of the material that presently runs into the ocean is from sedimentary rocks that have gone through the cycle before. For this reason, the concentration of salts in the sea is now fairly stable, having changed very little for millions of years.	31-32
Salts of the Seas	Explain that during all this time, the water of the oceans has been passing through continuous cycles of evaporation and condensation. Every year about 80,000 cubic miles of seawater are drawn off by evaporation. Of this huge quantity of water, about 24,000 cubic miles return to the continents as rain, sleet, and snow. The remaining water returns directly to the ocean as rain, but 1 or 2 percent remains in the atmosphere as water vapor. Gustly surface winds carry aloft salt from ocean spray, dust, volcanic ash, and even smokestack pollutants that become nuclei for rain or snow. The moisture in the atmosphere is attracted to these foreign bodies. Droplets form and gradually grow until they become so heavy that they fall to the surface as raindrops during the warm months and snowflakes during the cold months.	33-34
Salts of the Seas	Explain that plants on land also add to the amount of water vapor entering the air by the process called transpiration. This is a special term used to identify the evaporation process through plants and trees. Water that has evaporated from the surface of the	35-36

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	ocean finally returns to the Earth carrying a microscopic pollutants or minerals. This circular trip of evaporation, condensation, and return travel to the sea by way of precipitation is called the hydrologic cycle (water cycle).	
Salts of the Seas	Explain that only magnesium and bromine are at present taken from the ocean water commercially. The reason for this is the supply of most of the other minerals is still plentiful from land mining sites, and it is too expensive to extract the minerals from seawater. Much of the magnesium used in the manufacture of lightweight alloys for airplanes and satellites now comes from the sea, however. The bromine is used in the manufacture of antiknock gasoline and other chemicals.	37
Salts of the Seas	Explain that research is constantly being done to try to develop profitable methods of extracting dissolved minerals from the sea. This is an area of oceanography and metallurgy (the extraction of metals from ore or seawater) that will undoubtedly expand as continental mineral resources are consumed.	38
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	39
Water Temperature	Explain that upper ocean water temperature varies from about 32 degrees Fahrenheit in the polar regions to a high of about 85 degrees Fahrenheit in the Persian Gulf. The salinity of seawater lowers its freezing point. We know that fresh water freezes at 32 degrees Fahrenheit and seawater has a freezing point of about 28 degrees Fahrenheit. On the deep ocean bottom, however, the cold, dense water stays at a uniform temperature of about 4 degrees Celsius (39.2 degrees Fahrenheit) all the time in all latitudes.	40-41
Water Temperature	Explain that an instrument called a bathythermograph, commonly called a BTs, can be dropped from ships to check water temperatures at various depths (bathy means "depth," thermo stands for "temperature," and graph stands for "record"). Most Navy combatants have a BT to take readings for continuous monitoring of the ocean for undersea warfare.	42-43
Water Temperature	Explain that ocean water samples can be taken in Nansen bottles, named for a Norwegian oceanographer, Fridtjof Nansen. The Nansen bottle is a metal cylinder with automatic closing valves on each end. These valves are linked by levers so they work together. The bottles are attached upside down on a long wire. During lowering, water flows straight through the bottle until it reaches the desired depth. At sampling depth, a weight called a messenger is sent down the wire, releasing the first bottle, which overturns, its valves closing to secure the sample. Another messenger weight, formerly resting on the bottle, then slides down to repeat a similar action on the next bottle below.	44
Water Temperature	Explain that as the Nansen bottles capture the water at each desired depth, the mercury column in a thermometer fastened to the outside is automatically fixed. This records the exact temperature of the water when the bottle turned over. In this way, temperatures at any depth in the ocean can be measured. When brought to the surface, the water sample can also be tested for salinity, other chemical content, minute marine life, and so on.	45
Sunlight and Water	Explain that in shallow places, the ocean's water appears light green, while in deeper areas it seems to be blue, gray, or dark green. These are colors seen when the water does not contain silt or mud near shore or the mouths of rivers. The colors change depending on whether the day is cloudy or sunny. Actually, the water itself has no color. What we see as the water's color is actually the reflection of the sky or scattering of light in the water. Some ocean bodies have been given their names	46-47

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	because they are colored at times the by plant or animal life contained in them, or by colored silt flowing into them. The Red Sea, for instance, is so named because of the red phytoplankton in the water. The Yellow Sea is so named because of the yellow clay silt carried into it by the rivers of northern China.	
Sunlight and Water	Explain that we know that the main source of energy for life is the sun. The radiant energy of the sun reaches the Earth after traveling about eight minutes and some 93 million miles through the void of space. Sunlight consists of a range or spectrum of different wavelengths of energy. These wavelengths include infrared (radiation with wavelengths longer than visible light but shorter than radio waves) and ultraviolet (radiation with wavelengths shorter than visible light but longer than x rays).	48-50
Sunlight and Water	Explain that the different colors of the visible spectrum can be seen by using a prism, or they can be seen in a rainbow. The atmosphere serves as a giant filter, keeping out most of the dangerous ultraviolet (above violet) rays. Much infrared light is absorbed by the water vapor and carbon dioxide in the atmosphere. This atmospheric blanket serves as a giant greenhouse, keeping in the warmth that helps to sustain life on Earth.	51-52
Sunlight and Water	Explain that some of the visible light striking the surface of the ocean is reflected back, but some goes down into the water. As it descends, it changes in quality and quantity. The water acts as a filter also, gradually scattering various wavelengths of light, beginning at the red end of the spectrum. Therefore, the deeper one goes into the water, the greater the amount of blue light. The color of the watery world below about 90 feet is a dark zone of blues, violets, grays, and blacks, and nothing more. The depth to which light penetrates varies according to the position of the sun and the turbidity (suspended materials) in the water.	53
Sunlight and Water	Explain that the oceans can be divided into three environments on the basis of light. The topmost is the lighted zone, which ranges in depth from a maximum of about 330 feet (100 meters) in the open, clear sea to about 3 feet (1 meter) in muddy estuaries. Next is the twilight zone, which is very dark violet, with only the slightest light penetration. No effective plant production takes place here. This layer ranges from about 260 feet to 655 feet (80 to 200 meters). Below the twilight zone is the area of total darkness called the dark zone.	54
Review Question	The Review Question is, "Describe how the ability of water to store heat makes life on earth possible." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	55
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	56
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	57

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III. Supplemental Activities –

A. In class Activity:

Supplies required: example of concept maps for take home activity

When: The in-class activity will take place prior to the lesson

In-Class: Prior to the lesson ask students the following:

1. What is water composed of? Can you draw a picture of the structure of water?
2. Which is of greater density - liquid water or ice?
3. How does water keep the Earth from getting too hot or too cold?
4. List three other things that you know about water.

These questions are used as a pre-assessment and also to draw interest to the lesson.

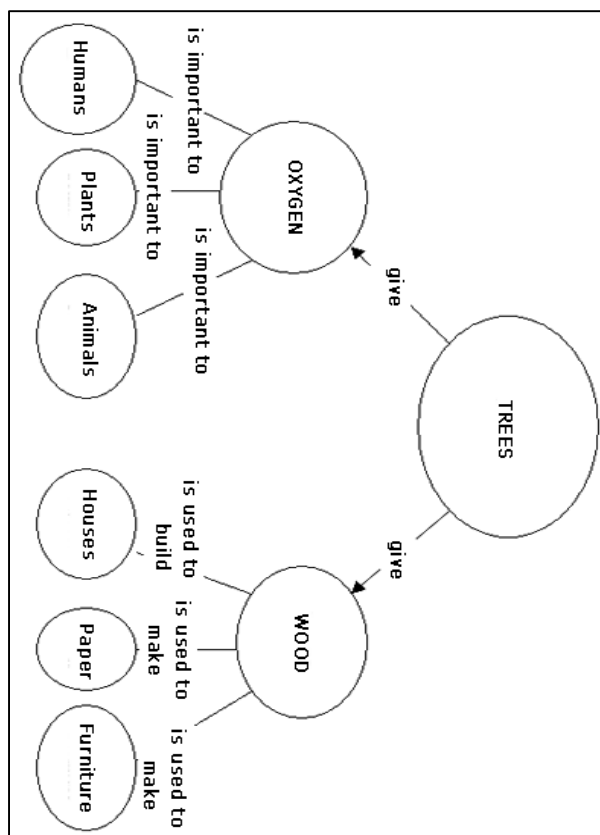
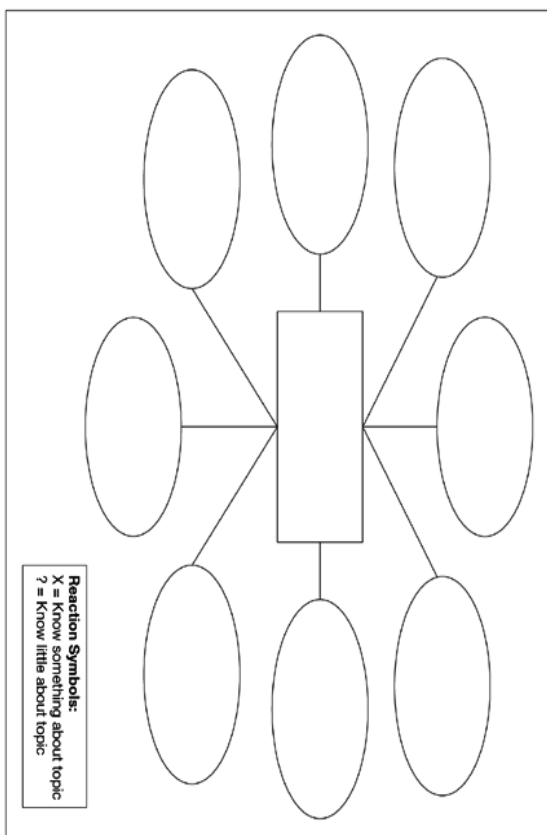
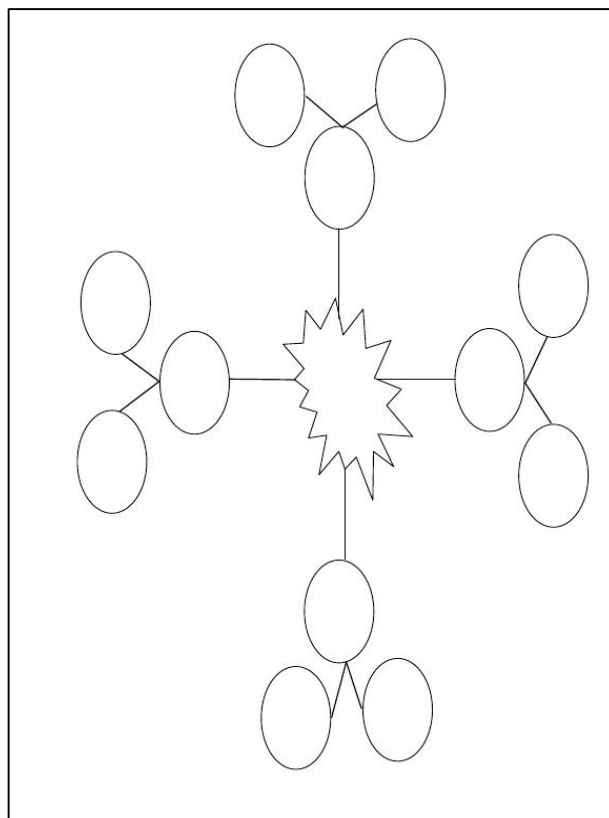
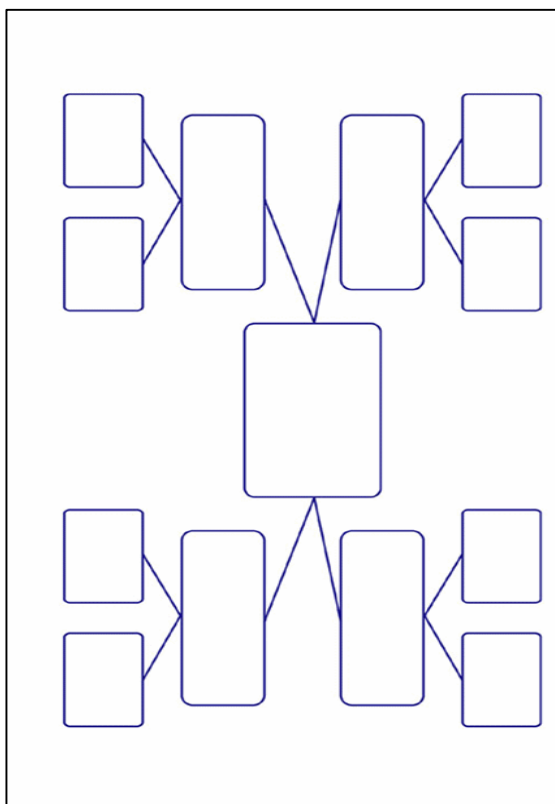
B. Take Home Activity: Cadets will make a concept map for the properties of water. Show examples of concept maps if necessary – There is a page of concept maps in the handouts for printing folder. Once the concept map is made, they will write a paragraph stating how these different concepts relate to their daily life.

How to make a concept map:

1. Identify the general/broad topic in which you are interested.
2. Brainstorm on the general topic and list all the concepts and themes that are related to the topic on a large piece of paper. Keep the concepts as concise as possible.
3. Using unlined paper, write the main theme in the center of the page.
4. Take the other concepts identified in the brainstorming and connect them to the center concept. You can use other organizational patterns such as branches, arrows or groups. More important ideas should be placed closest to the center and less important ideas closer to the edge. Identify the relationship between the concepts.

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Examples of concept map layouts:



Chapter 5 / Section 2: NS2-M3C5S2 – Waves

(Section 2 of 3)

What Students Will Learn to Do:

Demonstrate an understanding of the significance of oceanographic study

Skills and Knowledge to be Gained:

1. Describe the causes of waves
2. Describe how wave movement is measured
3. Cite the causes of beach and coastline erosion
4. Describe the effects of wave power

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Warm Up Questions	Waves	Check On Learning A	Breakers and Surf (A)
Video Breakers and Surf	Breakers and Surf (B)	Beach and Coastline Erosion (A)	Check on Learning B	Beach and Coastline Erosion (B)	Review Questions	Closing Questions	Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 5. Place a checkmark beside the NS2-M3C5S2 PowerPoint presentation, and these two CPS question deck files: NS2-M3C5S2 - Key Terms and NS2-M3C5S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

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II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will discuss the chemical makeup of water including the physical properties of water and its composition. We will talk about the composition of seawater. While we tend to think of seawater as being very salty, in reality, it is not. In most areas water is only 35 parts salt to 1,000 parts seawater. There are some lakes with a much higher salt content. We will discuss these lakes and we'll see how oceanographers are able to measure the salinity of seawater. We will finish the lesson with talking about the physical properties of water, the tides, waves, and currents, and their effects on the land areas of the Earth.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-9
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "List 2-3 things you notice about waves when you observe them from the shore." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on waves.	10
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	11
Waves	Explain that any disturbance, even a raindrop in a puddle, will create ripples of tiny waves. The tsunami waves caused by an exploding undersea volcano or an earthquake can travel entirely across the ocean. Wind, however, is the most common cause of ordinary sea waves. Sailors often call wind-driven waves "sea," or the state of the sea. For example, a swell is a long, smooth wave coming from a distant storm center. Swells may indicate an approaching storm, and they are common in advance of hurricanes.	12
Waves	Explain that as the wind begins to blow over a smooth ocean surface, a certain amount of wind energy is imparted by friction and pressure on the underlying sea surface, causing waves to be formed. Wave height depends on three main factors: wind speed, duration of the wind, and the length of the fetch (the distance the wind blows over the water). The longer the fetch and the stronger the wind, the higher and longer the wave will be. At about 13 knots of wind, whitecaps will begin to form. Sea waves 12 to	13-15

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	15 feet high are not uncommon during a strong sea. Waves 25 to 30 feet high or more form during severe storms or hurricanes.	
Waves	Explain that waves in excess of 50 feet in height are very unusual, although a few are occasionally reported. Years ago the Navy tanker <i>USS Ramapo</i> reported a 114-foot wave. What may have been seen and measured by the naked eye in that incident, however, could have been the spray associated with a large, unstable wave.	16
Waves	Explain that the storm area of the sea over which wind blows to create waves may extend over more than 2,000 square miles on the open ocean. The larger the wave, the more easily the wind can add energy to its crest. There is a limit to a wave's growth, however. At the edge of the fetch—that is, where the wind effect on the waves ceases—the waves gradually change into smooth swells.	17-19
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	20
Breakers and Surf	Explain that waves that break (fall over) when they hit bottom in shallow water are called breakers. A line of breakers along a shore is called a surf, or surf line. There are three types of breakers. The type is determined by the slope or gradient of the bottom.	21
Breakers and Surf	Explain that a spilling breaker develops where there is a mild, gradual, almost flat bottom shape. The breaker is slight and can be seen advancing as a line of foam toward the beach.	22
Breakers and Surf	Explain that a plunging breaker occurs where there is a steep bottom slope, such as occurs with a coral reef a mile or so offshore. Such a gradient creates the often huge surfs off Australia, South Africa, and Hawaii which are the joy of surfers. The plunging breaker creates an advancing vertical wall of water called surf.	23
Video on Breakers and Surf	Show video on breakers and surf	24
Breakers and Surf	Explain that a surging breaker occurs where there is a very steep bottom slope with sudden rock formations such as are found along the coasts of Alaska, Chile, Norway, Maine, and much of California. These formations are very close to the continental landmass. The waves crash into the bottom rocks and the breaker explodes in a surge of foaming, turbulent water. It is extremely dangerous to be near such a coastline in bad weather, and it is rarely safe to swim in such areas. Each year, many people are swept into the sea and drowned by sudden surging breakers.	25
Breakers and Surf	Explain that knowledge of sea waves, swell, and surf conditions is crucial to Naval and Marine amphibious operations. Surf conditions must be predicted accurately in order to determine when troops and vehicles from amphibious landing craft can be safely landed. A four-foot surf is considered to be the "critical" height for normally safe amphibious landings on an average beach. Above that height, boats may broach—that is, turn broadside to the beach after grounding. Broaching can cause damage to propellers and bring sand into engine intakes.	26-27
Beach and Coastline Erosion	Explain that coastal landforms owe their shapes to the action of waves, tides, and currents on coastal rocks and sediments. Such wearing down and changing of the coastal outline and makeup is called erosion. Repeated ocean action against exposed rocky headlands, and especially sandy shores, constantly remodels beaches and topography near the shore. People who have had the misfortune of having a beach	28

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	cottage undermined or washed away on the eastern seaboard or on the Gulf of Mexico during gales and hurricanes understand this very well.	
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	29
Beach and Coastline Erosion	Explain that waves and currents produced by waves cause most major shoreline changes. It is estimated that shorelines of the United States are being worn away at the rate of about 1 foot each year. For example, Cape Cod, Massachusetts, may be completely eroded away in about five thousand years if the present rate of erosion by waves continues.	30
Beach and Coastline Erosion	Explain that on the other hand, waves and currents cause sediments to accumulate in other places. The great Mississippi River Delta continues to grow into the Gulf of Mexico as a result of sediments carried down the river from interior North America. This endless struggle between construction and destruction of the surface of the Earth is one reason geology and oceanography are fascinating.	31
Beach and Coastline Erosion	Explain that in addition to the pounding of water against the shore, small fragments of rocks and sand carried by the waves also scour away beaches and wear down the shoreline. Seaward of breakers, fine grains of sand and pebbles constantly move back and forth in a continual grinding action much like sandpaper on a tabletop. Often, this erosion effect is concentrated more in one area of the shore than in another. The waves align themselves with the bottom contours and conform to the general slope of the coastline. When one part of the line develops drag and changes direction or bends because of shallower water, it is called 'refraction'. Such information is very important when an amphibious assault is being planned.	32-33
Beach and Coastline Erosion	Explain that in order to take advantage of natural phenomena when designing structures to protect shorelines and harbors, engineers must also know the way water waves are bent. Engineers must know where the natural energy is concentrated and where it is weaker so they can build for greatest effect and economy. The most common structure built to protect harbors is the breakwater. A breakwater is a line of large rocks, sometimes strengthened by steel-reinforced concrete.	34
Beach and Coastline Erosion	Explain that another common structure along inhabited seacoasts is the groin. Usually built in a series of two or more, groins are walls of stone or wooden pilings built at right angles to a shoreline to prevent erosion by longshore currents that occur at the immediate shoreline. Groins serve as dams to stop the movement of sediments by these currents. They may protect a given beach, but such interference with natural processes may also result in more erosion from waves farther down the beach.	35-36
Beach and Coastline Erosion	Explain that sandbars created by waves can become a navigational hazard. Rip currents are strong seaward moving currents that occur when opposing longshore currents meet.	37
Beach and Coastline Erosion	Explain that Rip currents are often incorrectly called undertow (the seaward and downward thrust of a wave as it breaks). But these currents do not actually pull swimmers or waders down. They may upset a wader and will pull a swimmer out from shore to deep water. Some rip currents are fast, moving at speeds of up to 2 miles an hour. Rip currents are rarely over 100 feet wide. If a swimmer is stuck in a rip current they should swim parallel to the shore and take care not to panic.	38-39

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Review Question	The Review Question is, “How does a rip current affect swimmers, and how should they react to get out of one?” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	40
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	41
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	42

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Internet connection, handout for At Home Activity

When: The activity can take place at any time during the lesson.

- In-Class: from the website NOAA, use the link to play the flash video:
http://oceanexplorer.noaa.gov/edu/learning/player/lesson09/I9Ia1_b.html
- Ask the following questions:
 1. **What is the wave period in the animation?**
ANS: The wave period in the animation is about 6 seconds.
 2. **What is the relationship between wavelength and wave period? As wavelength increases, how is wave period affected?**
ANS: The wavelength is the distance between successive waves. The wave period is the time taken for waves to cover that distance.
 3. **The approximate speed of a wave train can be calculated from the average period of the waves in the train, using a simple formula: speed (in knots, which are nautical miles per hour) = 1.5 x period (in seconds). If N.O.A.A. reports that a gale 400 nautical miles offshore has kicked up high waves with a period of 12 seconds, when should you go to the beach?**
ANS: The speed of the wave train is 1.5 x 12, or 18 miles an hour. Since the waves are coming from 400 nautical miles away, they should hit the beach in just over 22 hours (400/18 = 22.22).
 4. **What will happen to the wave period as the wave train reaches shallow water?**
ANS: If the time it takes for successive wave crests to pass a point is constant even as the waves slow, the crests must get closer together, which means the wavelength decreases. As waves approach the shore, they bunch up and the crests break in rapid succession.

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Tech Tip: There are videos and interactive lessons on the site complete with formative assessments that can be done with response devices as a class.

<http://oceanexplorer.noaa.gov/edu/learning/player/lesson09.html>

B. Take Home Activity: Have the cadets complete the “Wave Review” activity.

IV. Evaluation - see CPS database for chapter test questions.

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Activity1: At Home Activity: Wave Review

Name: _____ Date: _____ Class: _____

1. In the space below, draw and label the anatomy of a wave. Use the following labels: crest, wave length, wave height and trough.
2. Describe the factors that determine the size of a wave.
3. List and describe the 3 types of waves.

Chapter 5 / Section 3: NS2-M3C5S3 – Ocean Currents and Gyres

(Section 3 of 3)

What Students Will Learn to Do:

Demonstrate an understanding of the significance of oceanographic study

Skills and Knowledge to be Gained:

1. Cite the causes of ocean currents and gyres
2. Describe the current movement in the Pacific Ocean
3. Explain three effects of subsurface or countercurrents
4. Explain the effects of the moon on our tides
5. Describe the effects of tides on coastal areas
6. Describe the theory of tidal energy

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Ocean Currents and Gyres (A)	Video Ocean Currents and Gyres	Ocean Currents and Gyres (B)
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Check On Learning A	Tides (A)	Video1 Tides	Tides (B)	Video 2 Tides	Tides (C)	Check on Learning B	Time And Tides
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Closing Questions	Review Questions	Call for Other Questions
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Key:

Textbook Content	Student Engagement and Assessment
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Chapter 5 / Section 3: NS2-M3C5S3 – Ocean Currents and Gyres

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 5. Place a checkmark beside the NS2-M3C5S3 PowerPoint presentation, and these two CPS question deck files: NS2-M3C5S3 - Key Terms and NS2-M3C5S3 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will discuss the chemical composition of water, along with its physical properties. We will talk about the composition of seawater. While we tend to think of seawater as being very salty, it really isn't. In most areas it is only 35 parts salt to 1,000 parts seawater. There are some lakes with a much higher salt content. We will discuss these lakes, plus we'll see how oceanographers are able to measure the salinity of seawater. We will finish the lesson with a discussion about the physical properties of water, the tides, waves, and currents and their effects on the land areas of the Earth.</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-15
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "Name the most important current affecting the U.S., and explain the reasons for its importance." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on ocean currents and gyres.	16
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	17

Chapter 5 / Section 3: NS2-M3C5S3 – Ocean Currents and Gyres

Ocean Currents and Gyres	Explain that the study of ocean currents can be complex. Like everything else in oceanography, new discoveries about the movements of ocean water are being made all the time. Ocean currents have a profound effect on people, the food cycle, and the weather of the world. We can only introduce this subject here with the expectation that some students will want to explore this fascinating area of oceanography more on their own.	18
Ocean Currents and Gyres	Explain that the movements of the atmosphere (winds) and oceans (currents) are linked to each other. A significant factor in these movements is the rotation of the planet on its polar axis. The rotation of the Earth, or spin, creates an invisible force called the Coriolis effect, or Coriolis force. This force deflects, moving particles to the right (clockwise) in the Northern Hemisphere, and to the left (counterclockwise) in the Southern Hemisphere.	19
Video on Ocean Currents and Gyres	Show video on ocean currents and gyres	20
Ocean Currents and Gyres	Explain that two other important factors affect global movements of wind and water. These are (1) wind acting on the water surface, and (2) the boundary effects of the continents. Because of the continents, no major ocean current runs all the way around the world.	21
Ocean Currents and Gyres	Explain that the heating of water in the equatorial region causes surface water there to rise and then to spread out and flow “downhill” over the surface toward the poles. (The water level of the Sargasso Sea in the mid-Atlantic east of Florida is actually about 3 feet higher than the water level along the west coast of the North Atlantic basin.) As it drifts toward the poles, this water cools and sinks, pushing the water below it toward the equatorial regions. This kind of circular flow, caused by heat differences within the water, is called convection. The more important factor affecting global water movements, though, is surface wind. Combined with the landmass placement, surface wind produces a different system. The resulting surface water movements or ocean currents, are a combination of these two flows.	22-24
Ocean Currents and Gyres	Explain that the prevailing winds in the Northern Hemisphere blow from the northeast in the latitude belt from 0 to 30 degrees. These are the trade winds which drive the ocean surface waters to the west. The prevailing winds in the belt from 30 to 60 degrees north blow from the southwest. These are the prevailing westerlies, which drive the waters back toward the east. From 60 degrees north to the North Pole, the polar north easterlies blow mainly from the northeast, causing surface current movement toward the west (see the global winds diagram). In the Southern Hemisphere, the prevailing winds are from the southeast in the latitude belt from 0 to 30 degrees.	25-26
Ocean Currents and Gyres	Explain that latitudinal prevailing winds create broad circular currents. These circular currents are called gyres. The movements in the Southern Hemisphere are opposite from those in the Northern Hemisphere because of the Coriolis effect. These circular systems of currents are called gyres.	27
Ocean Currents and Gyres	Explain to bear in mind that winds are named by the direction from which they are blowing while currents are described in terms of the direction in which they are flowing. Thus: A colonial Sailor using Ben Franklin’s map to catch the Gulf Stream flowing NE, with prevailing winds (SW at 40° N Lat), could have following winds and a speedy trip. A NE current and a SW wind are headed in the same direction.	28

Chapter 5 / Section 3: NS2-M3C5S3 – Ocean Currents and Gyres

Ocean Currents and Gyres	Explain that while these major currents are well defined, they continuously mingle with other currents, especially in the sub-polar regions. Also, there is a constant exchange of Atlantic Ocean water with the Mediterranean Sea through the Strait of Gibraltar. This is due to the difference in salinity of these two bodies of water. This difference causes lighter Atlantic water to flow into the Mediterranean basin while the heavier, saltier water flows out beneath it.	29
Ocean Currents and Gyres	Explain that the Gulf Stream is the most important current affecting the United States and its entire Atlantic seaboard. The Gulf Stream system flows in a clockwise motion in the North Atlantic. In the center of this moving water mass is the legendary Sargasso Sea. This is a vast area of floating plants, thought to be true natives of these waters. These plants float near the surface by means of air bladders. This is not a thick mass of seaweed that traps ships as is so often pictured in mystery stories of the sea. On the average, about 3 miles deep, this oval area is about 2,000 miles east and west by 1,000 miles north and south. The blue waters of the Sargasso Sea form one of the oceanic deserts. The plant species that inhabit this region are adapted to this environment.	30-32
Ocean Currents and Gyres	Explain that the North Equatorial Current carries warmer waters northwestward along the West Indies on the eastern rim of the Caribbean Sea. Part of the current breaks off and enters the Gulf of Mexico. The bulk of the current rushes northward to form the Gulf Stream that moves along the Florida, Georgia, and Carolina coasts, and then begins to spread out and turn eastward in the North Atlantic Drift. The water flows northward at about 3 to 4 miles an hour. The stream becomes wider and breaks off into meanders (different streams) in the northern latitudes. As it goes along the Grand Banks of Newfoundland, it parallels the southward-moving, cold Labrador Current. The Labrador Current brings icebergs that have calved or broken away from the western Greenland glaciers and drifted into the North Atlantic shipping lanes. Here they meet the Gulf Stream's warm water and eventually melt.	33-34
Ocean Currents and Gyres	Explain that in winter, the warming effect of the Gulf Stream and North Atlantic Drift make the climate along the eastern seaboard of the United States and Canada, Iceland, Great Britain, and Western Europe much warmer than other regions in the same latitude. In the late summer and early fall, the southern side of the Sargasso Sea is the spawning ground for hurricanes, which are severe storms with winds greater than 75 mph. These storms, driven by winds higher in the atmosphere, often follow the Gulf Stream into the Caribbean and the Gulf of Mexico or up the East Coast of the United States. Hurricanes often leave a trail of destruction before dissipating in the high latitudes of the North Atlantic.	35-37
Ocean Currents and Gyres	Explain that the Kuroshio or Japan Current originates from the greater part of the (Pacific) North Equatorial Current. Like the Gulf Stream, which flows northwestward on the Atlantic side of the state of Florida, the Kuroshio Current flows northwestward from Japan's Ryukyu Islands.	38
Ocean Currents and Gyres	Explain that during the year there are on average, twenty typhoons in the western Pacific. Typhoons are the Pacific equivalent of hurricanes. Spawned in the region of the North Equatorial Current, just north of the equator, they often roar along the track of the Kuroshio, particularly during the late summer months when high-level hemispheric winds flow in a similar pattern. During the cooler months, the typhoon track travels through the Philippines and into the South China Sea and eventually into Vietnam. As the warm Kuroshio Current expands north of Japan, it passes south of, but in close proximity to the cold Oyashio Current coming out of the Bering Sea. The Kuroshio Current travels eastward across the North Pacific and splits into two branches. One of these branches is the Alaskan Current, which travels	39-40

Chapter 5 / Section 3: NS2-M3C5S3 – Ocean Currents and Gyres

	counterclockwise around the Gulf of Alaska and westward south of the Aleutian Islands. The other branch becomes the California Current, which travels southward along the west coast of the United States.	
Ocean Currents and Gyres	Explain that while the frictional force of Earth's winds sets the major surface currents of the world in motion, a counterforce caused by gravity and the Coriolis effect, particularly in higher latitudes, often creates an opposite motion in the deeper water layers.	41
Ocean Currents and Gyres	Explain that near the equator, the deepest water may be moving exactly 180 degrees (opposite) from the surface flow. This amazing phenomenon was discovered in 1952 by Townsend Cromwell, a scientist working with the U.S. Fish and Wildlife Service. He was experimenting with deep-sea fishing techniques.	42
Ocean Currents and Gyres	Explain that dropping long lines into the South Equatorial Current in the Pacific Ocean, a west-flowing current, Townsend discovered that the lines drifted eastward. This indicated the existence of a strong undercurrent. Later research showed that this undercurrent, or countercurrent, proceeds 3,500 miles to the Galápagos Islands off Ecuador, carrying 30 million tons of water eastward every second.	43
Ocean Currents and Gyres	Explain that in 1955, oceanographer Henry Stommel theorized that a countercurrent flowed beneath the Gulf Stream. In 1957, the combined United Kingdom–United States International Geophysical Year (I.G.Y.) investigation proved that Stommel's theory was correct.	44
Ocean Currents and Gyres	Explain that the oceanographers used a floating underwater device called the Swallow buoy in their investigations. Invented by Dr. John Swallow, this equipment can be made to free-float while remaining at any chosen depth.	45
Ocean Currents and Gyres	Explain that a Swallow buoy carries a simple "beeper" or "pinger" that sends out electronic signals that can be picked up by a receiver aboard ship. Using Swallow buoys at different depths, oceanographers found that the Gulf Stream surface current moves about 100 miles a day northeastward, while at depths from 1,350 to 1,500 fathoms, countercurrents move in the opposite direction about 1½ to 15 miles per day. Just above the ocean floor at 1,750 fathoms, the countercurrent was found to move 2½ miles a day in the opposite direction.	46
Ocean Currents and Gyres	Explain that the different directions of motion and speed of the surface and the countercurrents create turbulence between the two layers of water, resulting in considerable vertical mixing. This mixing is particularly strong at the equator, where the two currents travel in nearly opposite directions. As a result, there is an upward transfer of rich nutrients. These nutrients are responsible for large numbers of fish in these regions. These distinct layers of water also influence the transmission of underwater sounds, an important consideration in undersea warfare.	47-49
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	50
Tides	Explain that Earth's nearest neighbor in space is the moon. The moon is the main cause of the rise and fall of ocean tides.	51
Video 1 on Tides	Show video 1 on tides	52

Chapter 5 / Section 3: NS2-M3C5S3 – Ocean Currents and Gyres

Tides	Explain that the ancient Greeks first recognized the relationship between the tides and the Moon's monthly movement around Earth. It was not until Sir Isaac Newton in his published <i>Principia Mathematica</i> worked out his theory of gravity in 1687, however, that this relationship could be explained.	53
Tides	Explain that science has determined that everything in the universe exerts a gravitational force or pull on everything else. The pull of gravity is very small for small objects, but for a planet, moon, or star, the force is enormous, and tends to pull every object into its own center of gravity. The mass (amount of material) of the body and the distance it is from the other object or body determines the gravitational effect. It is gravity that holds the planets in their orbits around the sun and keeps the moon and Earth "connected" as companions in space.	54-55
Tides	Explain that the pull of the moon's gravity causes the oceans on the Moon's side of Earth to bulge out toward it. The gravitational pull, however, is not the same everywhere. The points of Earth closer to the moon are pulled more strongly and those farther away are pulled less. This effect, in addition to an outward centrifugal force on the far side of Earth caused by the rotation of the Earth-Moon system about their common center of gravity, causes the water on the far side of Earth to bulge outward as well, though not as much as on the near side.	56
Tides	Explain that the sun also causes tides but this effect is only about two-fifths as strong as that caused by the moon. Though it is of course, much more massive than the moon, the sun's effect on tides is smaller because it is 390 times farther away.	57
Tides	Explain that the variations in position of the sun and moon in relation to Earth produce the high and low ranges of tides. At times of the new and full moons, the tides are highest and lowest because the forces of the moon and sun are working together. The result is spring tides. (The term has nothing to do with the spring season.) Halfway between the new and full moons, when we see the half-moon during the first and third quarters, the tidal forces of the moon and sun are opposed. At this time the difference between high and low tides is much less. These are called neap tides.	58-59
Tides	Explain that the ebb of a tide is the fall of the tide, that is, the moving of the tide away from the shore. The flood of the tide is the rise of the tide, or the flowing of the tide toward the shore to its highest point. The ebb and flood of tides vary widely around the world. They are affected not only by basic gravitational forces but also by the location of the continents and mid-ocean ridges, the shape of the shoreline, the frictional drag between the water mass and the seabed, and the Coriolis force created by Earth's spin. Each tidal system is restricted to its own ocean basin by the continents.	60
Video 2 on Tides	Show video 2 on tides	61
Tides	Explain that local tides are determined by Coriolis force, frictional drag, ocean topography, shoreline shape, continent location, and gravitational alignment.	62
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	63
Time and Tides	Explain that high tides occur twice a day in most parts of the world because, as mentioned earlier, when it is high tide on the side of Earth nearest the moon, there is also a lower high tide on the opposite side of the Earth. Knowing that the Earth turns on its axis once in twenty-four hours, we might presume that these high tides would be exactly twelve hours apart.	64

Chapter 5 / Section 3: NS2-M3C5S3 – Ocean Currents and Gyres

Time and Tides	Explain that the moon and Earth are not in a fixed position relative each to the other. The moon revolves around Earth once in about twenty-seven days, in the same direction as the rotation of the Earth. Because of this motion, it takes twenty-four hours and fifty minutes for a given location on Earth to again be directly opposite the moon. Therefore, there are twelve hours and twenty-five minutes between high tides.	65
Time and Tides	Explain that because these facts are known precisely, tide tables for each harbor on Earth can be accurately predicted for many years in advance. The National Ocean Service (N.O.S.), a division of the National Oceanic and Atmospheric Administration (NOAA), publishes Tide Tables and Current Tables to assist mariners sailing in most parts of the world. Times of high and low tides figured from these tide tables normally are published daily in the plan of the day aboard ship and at naval bases. This information is important in part because responsible officers and the deck department can use it as a guide when providing for slack in a ship's mooring lines. The ship's navigator must also be aware of tidal changes in harbors and channels because variations in water depths may be extreme. If tidal currents are strong, boat officers and coxswains must take such information into account when planning boat runs and schedules.	66-67
Time and Tides	Explain that the tides in mid-ocean are measurable only with scientific instruments and may have a height of only a few feet. On the shorelines, however, the effect of tides is usually quite evident. In Boston, the range is about 12 feet, in Norfolk less than 6, and in the Mediterranean only a few feet. In some areas of the world, though, tidal effects are extreme. This is especially so in the high northern latitudes. The highest tides in the world are experienced in the Bay of Fundy, between Nova Scotia and the Canadian mainland, where the spring tide often exceeds 50 feet.	68-69
Time and Tides	Explain another very high tide occurs at the island of Mont-St.-Michel, France, on the English Channel. This island is surrounded by 10 miles of sands at low tide, but when the 41-foot tide rises, the water moves toward the shore at a rate of 210 feet per minute and completely surrounds the island. Very high tides are also experienced in Alaska, northern Europe, and the northeastern coast of Asia. The harbor at Inchon, Korea, for instance, must enclose its piers with graving basins or docks. This is a system of locks that hold in the 40-foot tidal waters during low tide, thereby keeping ships alongside the piers afloat. Were it not for the graving docks, the ships would hit bottom and be severely damaged.	70-71
Time and Tides	Explain that in areas where a high tide is common, a tidal bore or tidal surge is often a twice-daily event where the tide sweeps up a river whose mouth opens directly on the sea. The world's highest tidal bores sweep up the Amazon River in Brazil and the Hangchow (Tsientang) River in China. These bores rise from 15 to 25 feet and speed up the rivers at 10–16 mph. The Amazon tidal bore affects the river more than 300 miles inland. Many rivers in Scotland, England, Norway, and Alaska have tidal bores. The River Severn in England has a 3-foot bore that travels 21 miles inland. The Petitcodiac River in Nova Scotia, Canada, has a bore wave 5 feet high that travels 50 miles inland.	72-74
Time and Tides	Explain that dangerous tidal currents occur in places where there are big inlets with narrow entrances. This occurs with some fjords (long narrow inlets from the sea) in Greenland, Norway, Alaska, and Chile. Currents flowing at 8 or 10 knots make it much too dangerous for boats and ships to attempt passage during much of the day. Tidal currents surge at speeds up to 10 knots through channels in the Great Barrier Reef northeast of Australia. The meeting of tidal currents and winds of the Atlantic Ocean and the North Sea in the Pentland Firth between northern Scotland and the Orkney Islands creates a bore sometimes 10 feet high.	75-77

Chapter 5 / Section 3: NS2-M3C5S3 – Ocean Currents and Gyres

Time and Tides	Explain that many sailors have lost their lives in the Pentland Firth bore (called the Swelkie by local Scots) since the days of the Vikings. Pentland Firth is said to be haunted by the ghosts of the drowned. It is said the ghosts howl and call out with the strong northwest winds to sailors passing by on dark winter nights.	78
Time and Tides	Explain that tidal energy is one of the oldest forms of energy used by humans. A tidal mill built in the Deben estuary (a wide part of a river where it joins the sea) in Great Britain was mentioned in records as early as 1170 and is still in operation. Creative engineering has resulted in a large number of schemes that make the tides a reliable source of energy.	79
Time and Tides	Explain that the French built the world's most highly successful tidal plant near St. Malo at the mouth of the Rance River estuary. A dam containing turbines spans the estuary.	80
Time and Tides	Explain that as the tides rise and fall, they spin turbines that drive banks of generators. The idea is simple: dam in a basin, which fills with the incoming tide, then, at low tide, release the water through sluice gates (regulated-flow channels or gates) so it can spin turbines and generate electricity.	81
Time and Tides	Explain that the Dutch have worked for centuries reclaiming land from the sea with dikes and pumps. Their biggest project was the enclosure of the Zuyder Zee. Another, the Delta Estuary Plan across estuaries of the Rhine, Meuse, and Scheldt Rivers was completed in 1978. One part of this system generates electricity by tidal flow. At the same time, the project creates freshwater lakes for recreation, reduces and protects the amount of shoreline directly exposed to the storm waves of the North Sea, reclaims land from the sea and creates a coastal highway system that connects many previously isolated islands in southern Holland.	82-83
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	84
Review Question	The Review Question is, "Fill in the Blank: Winds are described by _____ from. Currents are described by _____ to." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	85
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	86

Chapter 5 / Section 3: NS2-M3C5S3 – Ocean Currents and Gyres

III. Supplemental Activities -

A. In Class Activity:

Supplies requires: Internet Connectivity, Tide Wheel Handout, scissors to cut out wheel

When: At the end of class

- Activity 1: Have the students take turns and completing the interactive lesson regarding the Coriolis Effect on this website:

<http://www.montereyinstitute.org/noaa/lesson08/l8ex1.htm>

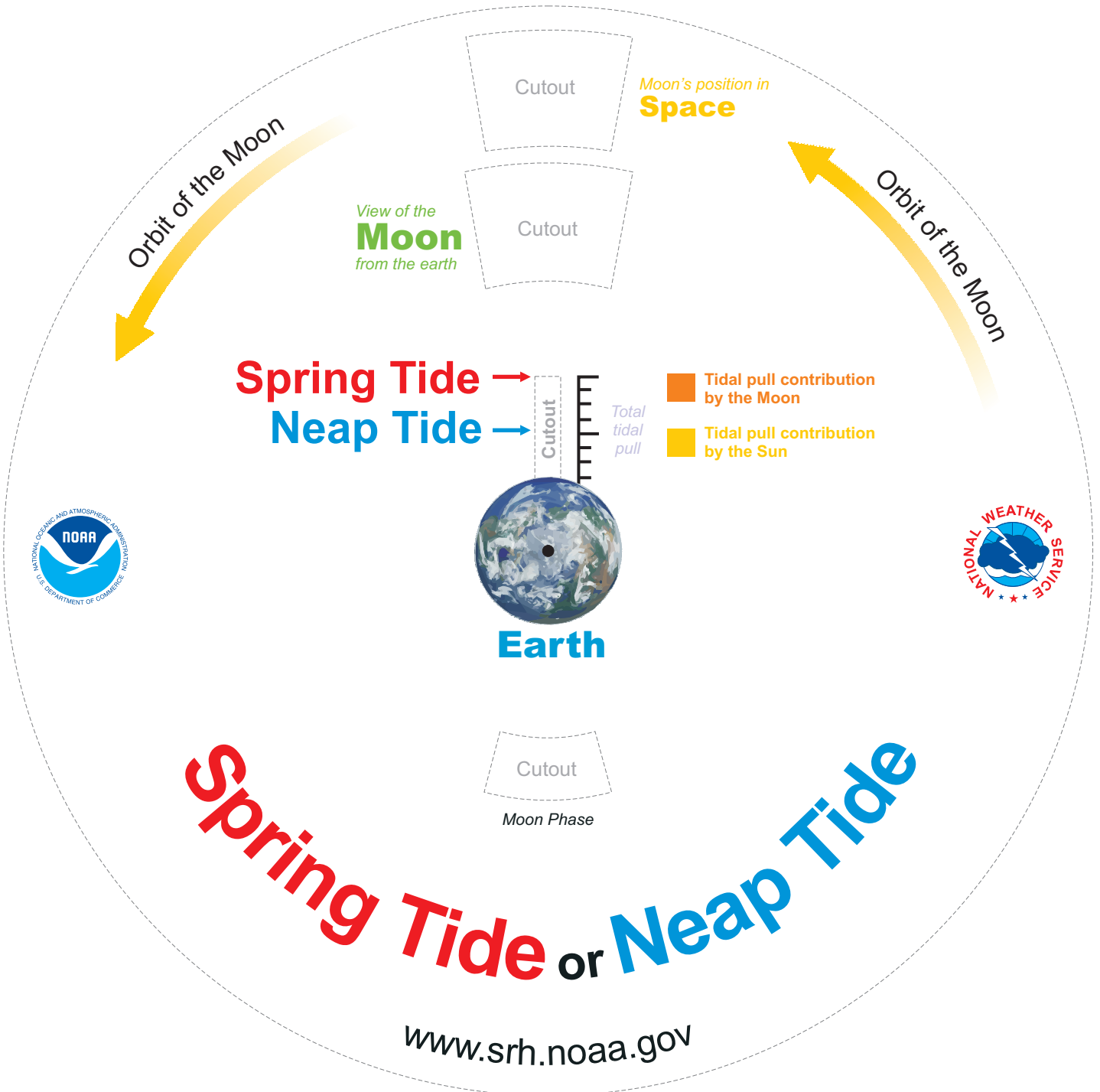
- Activity 2: Have cadets put together the "Tide Wheel" handout. As a class, discuss observations from the wheel as a class.

B. Take Home Activity: Have the cadets make a booklet that is suitable for children explaining the effect that the moon has on tides. This booklet should describe and illustrate the following:

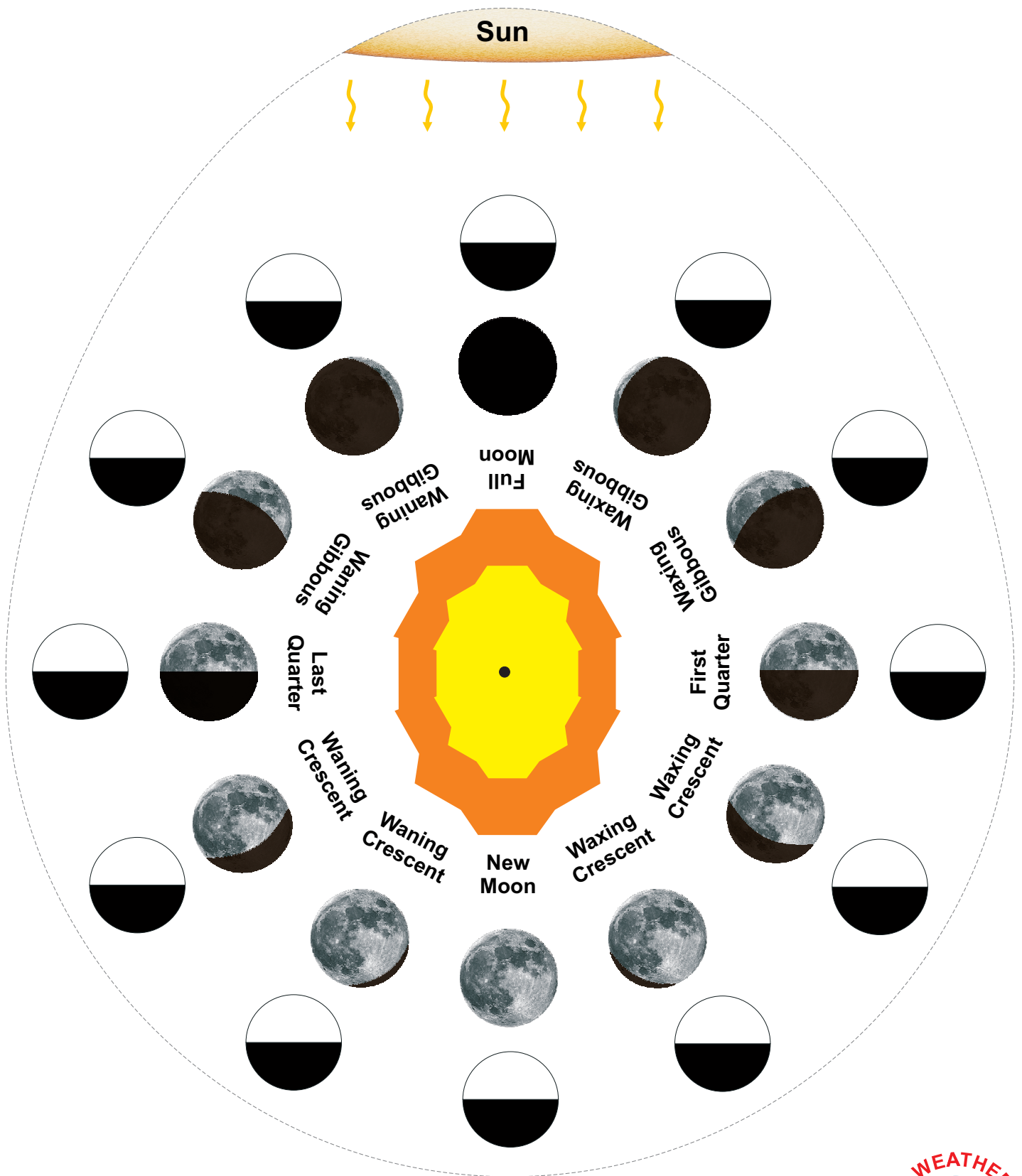
1. What is a tide?
2. What is the difference between high and low tide?
3. How does the moon affect tides?
4. What is a spring tide?
5. What is a neap tide?
6. Define ebb and flood.

IV. Evaluation - see CPS database for chapter test questions.

Cut the circle along the edge.
Cut the white areas where the word “cutout” appears.



Cut the egg-shaped object along the edge.



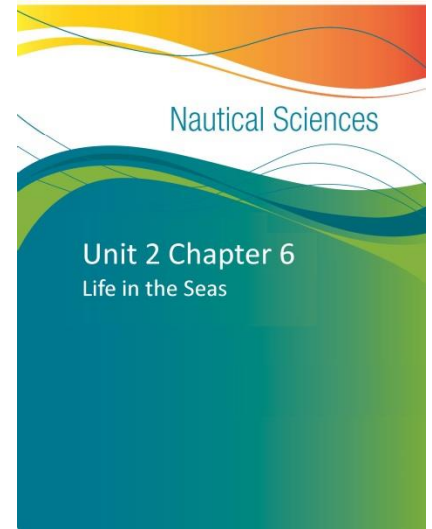
Module 3 Chapter 6: NS2-M3C6 –Life in the Seas

What Students Will Learn to Do:

Demonstrate an understanding of the significance of oceanographic study

Skills and Knowledge to be Gained:

1. Describe how microscopic plant life is involved in the ecological system of the oceans
2. Cite the chain of natural events that occur in the food cycle in the seas
3. Describe life-sustaining characteristics of marine life at the edge of the sea
4. Describe the abundance of life in the shallow sea
5. Describe the two major divisions of marine animals and their characteristics
6. Discuss the laws of conservation
7. Describe the effects of the open sea on man
8. Cite methods used to increase stocks of commercial fish
9. Explain the marine “farming” method called aquaculture
10. Describe the bioluminescence of the sea at night and its characteristics
11. Describe how biological fouling and deterioration affect the Navy’s annual budget
12. Describe four categories of harmful marine animals that pose a threat to man
13. Describe the types of equipment used to improve man’s capability to penetrate the sea
14. Describe the seven major groups of pollutants and their effects on marine life



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...
- RI.9-10.7. Analyze various accounts of a subject told in different...

Writing

- W.9-10.1. Write arguments to support claims in an analysis of substantive topics or texts...
- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...

Module 3 Chapter 6: NS2-M3C6 –Life in the Seas

- SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically...
- SL.9-10.5. Make strategic use of digital media in presentations...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Geography

- D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them.
- D2.Geo.5.9-12. Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.
- D2.Geo.12.9-12. Evaluate the consequences of human-made and natural catastrophes on global trade, politics, and human migration.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...
- D2.His.2.9-12. Analyze change and continuity in historical eras.
- D2.His.14.9-12. Analyze multiple and complex causes and effects of events in the past.

Dimension 3. Gathering and Evaluating Sources

- D3.1.9-12. Gather relevant information from multiple sources representing a wide range of views...
- D3.2.9-12. Evaluate the credibility of a source by examining how experts value the source.

Next Generation Science Standards (NGSS)

HS.Interdependent Relationships in Ecosystems

- HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.
- HS-LS2-8. Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.

HS.History of Earth

- HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.

HS.Earth's Systems

- HS-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.

Module 3 Chapter 6: NS2-M3C6 –Life in the Seas

HS.Human Sustainability

- HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 6 / Section 1: NS2-M3C6S1 – Simple Life in the Seas

(Section 1 of 5)

What Students Will Learn to Do:

Demonstrate an understanding of the significance of oceanographic study

Skills and Knowledge to be Gained:

1. Describe how microscopic plant life is involved in the ecological system of the oceans
2. Cite the chain of natural events that occur in the food cycle in the seas
3. Describe life-sustaining characteristics of marine life at the edge of the sea
4. Describe the abundance of life in the shallow sea

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	Plankton, Start of the Life Cycle	Check On Learning A
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Upwelling, El Nino and La Nina (A)	Video Upwelling, El Nino and La Nina	Upwelling, El Nino and La Nina (B)	The Red Tide and Black Sea	Check on Learning B	The Life Cycle in the Sea	Life in the Shallow Sea	Review Questions
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Closing Questions	Call for Other Questions
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Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 6. Place a checkmark beside the NS2-M3C6S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C6S1 - Key Terms and NS2-M3C6S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 6 / Section 1: NS2-M3C6S1 – Simple Life in the Seas

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will study marine biology, that is, the science that deals with the living, organic content of the sea. We will learn about marine plants and animal life. Our discussion of marine animals will include fish, reptiles, birds, and mammals. Did you know the polar bear is a specially-adapted marine animal? We'll also talk about some harmful marine life. Most of you are familiar with man-eating fish; what do you know about the fish family whose sting is as deadly as a cobra's bite? We will discuss the biological fouling and deterioration caused to Navy ships and how it affects the Navy's annual budget. Man uses the sea for food and employment, naval operations, scientific research, and many other reasons. We'll discuss several of these reasons. We will also look at some problems sea noises and marine life cause for our naval operations and what's being done about those problems. We will talk about the types of equipment used by man to penetrate the sea and also the seven major groups of pollutants and their effects on marine life.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-16
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "What are the threats to a thriving marine ecology?" Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. The selected student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on an introduction to life in the seas.	17
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	18
Introduction	Explain that there are many separate areas of study within modern marine biology and we cannot explore all areas in this text. One important field is biological oceanography, or marine ecology. This field is concerned with marine organisms and their environment. It is directly related to (1) human use of the sea for food and employment, and (2) the effect of marine life on naval operations. The latter includes the effect of marine organisms on ships, installations, and equipment, the ability of people to live and work on and under the sea, the effectiveness of sonar equipment, and many other important topics.	19

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Plankton, Start of the Life Cycle	Explain that plankton, both plant and animal, are those billions of tiny floating organisms that wander with the ocean currents or drift in the uppermost layers of the sea. The plankton provides the “ocean pasture” for the smallest animals and fish. Materials in suspension in the sea, including decayed plant and animal life, provide the nutrients needed by plankton.	20-22
Plankton, Start of the Life Cycle	Explain that phytoplankton are microscopic marine plants that begin the food chain, an ecological system in which almost every form of life becomes the food for another, usually higher, form of life. Next are the zooplankton, tiny animals and larvae of larger sea life. Finally there is an entire range of larger fish and sea animals, which extends from fishes and crabs to the giant blue whale, the world’s largest mammal.	23-25
Plankton, Start of the Life Cycle	Explain that to show how small plankton are, and to see if enough plankton could be gathered for a meal, explorer Thor Heyerdahl dragged a plankton net behind his balsawood raft, the <i>Kon-Tiki</i> , for many hours across the southern Pacific in 1947. He managed to gather a small amount of edible plankton, which he made into a sort of fish paste. He found it to be very salty. Studies have now proved that this material is almost pure protein. In fact, the sea is believed to contain a large percentage of the world’s total supply of protein.	26-28
Check on Learning Questions A (Lesson questions 3-4)	Check in on student’s understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	29
Upwelling, El Nino and La Nina	Explain that ‘upwelling’ is the movement of deeper layers of water toward the surface. Upwelling takes place when prevailing winds along a shore cause movement of upper water layers away from the coast. The Coriolis force is also a factor in this process. The resultant vertical circulation from great depths brings decayed materials high in nitrogen and phosphates to the surface. Upwelling occurs near the steepest gradient of the continental slope.	30
Upwelling, El Nino and La Nina	Explain that the most remarkable upwelling occurs along the Peruvian coast between the shoreline and the northward-flowing Humboldt Current. The nutrients and minerals nourish plankton, which, in turn, attract great numbers of fishes, large and small, to the area. Great flocks of seabirds feed on these fish and the islands on which the birds’ nests are covered with tons of their droppings which are called guano. Over 330,000 tons of guano are “mined” annually for high-grade fertilizer. Fishermen catch up to 100,000 tons of anchovies and sardines and the larger fish that feed on them each year.	31-34
Upwelling, El Nino and La Nina	Explain that occasionally, for reasons not yet fully understood but likely related to reduced trade winds, the Humboldt Current meanders from its normal course or actually disappears, allowing warmer currents to come along the coast and make the surface layers of water warmer than usual. This prevents upwelling, and without the life-supporting nutrients, fish begin to die. In addition, millions of sea birds may die in such famines.	35
Upwelling, El Nino and La Nina	Explain that the hydrogen sulfide from the decaying bodies of both fish and birds is so thick that ships’ hulls are turned black. This occurrence is locally called the Callao Painter, named after the nearby port of Callao, Peru. The phenomenon that causes upwelling to stop is called El Niño (“little boy” in Spanish). The change in world-wide weather patterns brought on by El Niño can reverse normally wet and dry areas, causing both flood and drought.	36-38
Video on Upwelling, El Nino and La Nina	Show video on upwelling, El Nino and La Nina	39

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Upwelling, El Nino and La Nina	Explain that El Niño has caused flooding in droughts in many parts of the world including South America and central United States. A most recent example occurred in the winter of 1997-98.	40
Upwelling, El Nino and La Nina	Explain that changes in the range of Equatorial Pacific's surface temperature affects upwelling and global climate.	41
Upwelling, El Nino and La Nina	Explain that during El Niño years in the continental United States, winter temperatures are warmer than normal in the North Central States and cooler than normal in the Southeast and the Southwest. During a La Niña year, winter temperatures are warmer than normal in the Southeast and cooler than normal in the Northwest	42
The Red Tide and Black Sea	Explain that in the Red Sea, atmospheric and sea conditions similar to El Niño occasionally occur. There, when the upwelling of cool water stops, the surface layers become heated and bring about a population explosion (or bloom) of tiny red-colored phytoplankton called dinoflagellata. They become so plentiful that the water takes on a reddish color, giving it the name Red Tide (and giving the Red Sea its name). The Red Tide clogs the gills of fish, causing them to suffocate and die. Millions of dead fish are washed ashore and the resulting stench carries for miles. A similar event occurs, more rarely, along the east coast of Florida. Some years ago, many resorts and bathing beaches had to close their business until the Red Tide passed and the dead fish were cleared away.	43-44
The Red Tide and Black Sea	Explain that the Black Sea is essentially a very large saltwater lake. Its only opening is through the Turkish straits (Bosporus and Dardanelles) to the Aegean Sea. The straits are very shallow, so there is little exchange of water between the two seas, with no chance for upwelling or the introduction of dissolved oxygen in the Black Sea. As a result, the Black Sea is stagnant. The residue of marine life in the surface layers sinks to the bottom and remains there to decay.	45-46
The Red Tide and Black Sea	Explain that the decay of animal and vegetable matter consumes whatever oxygen is available and creates hydrogen sulfide gas. Over thousands of years, this gas and lack of oxygen have completely destroyed bottom life in the Black Sea. The hydrogen sulfide layer begins approximately 200 feet below the surface and continues to the bottom. There is no life in this "black zone," which has given its name to the sea.	47
The Red Tide and Black Sea	Explain that for Navies, the Black Sea poses a special problem. When mixed with water, hydrogen sulfide gas has a corrosive effect on metals. Recall the Callao Painter turning the sides of ships black. A submarine operating for long periods of time in the hydrogen sulfide zone would run a serious risk of ruining her hull fittings, thereby endangering the boat and her crew.	48
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	49
The Life Cycle in the Sea	Explain that life in the ocean may answer many of the questions about the origin of life and its historical past, as well as help solve the problems of improving human life in the future. The life cycle in the sea is of great importance to everyone. Marine biologists are the scientists who are working to find the answers to some of these questions. A life cycle is the chain of natural events in which organic plants and animals take in foods and chemicals, release wastes during their lifetimes, and then die and decompose. Upwelling brings nutrients back into the sunlight where plants use them in photosynthesis.	50-51

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The Life Cycle in the Sea	Explain that photosynthesis occurs only near the surface where sunlight is available as the energy source. Phytoplankton are the basic food producers of the sea. Through photosynthesis, phytoplankton provide the proteins, starches, and sugars necessary to support the grazing zooplankton (tiny animals of many shapes, appearances, and locomotion) and the eggs and larvae of some larger fishes. Zooplankton are the food for the small flesh eaters of the ocean. These small carnivores become prey to larger ones. Death and decay then complete the cycle.	52-54
The Life Cycle in the Sea	Explain that the organic material of both plants and animals decays as the result of bacterial action, thereby releasing again the nutrient raw materials, carbon, phosphorus, and nitrogen, needed to start the process of photosynthesis once again. Since the organic material sinks, most of the decay occurs in deep water. Upwelling currents eventually return the nutrients to the lighted zone in the upper 15 to 20 fathoms of water where this life cycle can begin again.	55
The Life Cycle in the Sea	Explain that though phytoplankton can live only in the lighted zone, usually in the upper 90 feet, zooplankton and larger animal life have been found in all parts of the ocean, including at the bottom of the deepest part of the 35,800-foot-deep Mariana Trench. Animals that live in these great depths are generally small, ferocious carnivores.	56-57
The Life Cycle in the Sea	Explain that they have very soft bodies without scales and yet with a wide variety of shapes. They are often snakelike with narrow fins and very pliant bones. Most are black in color due to the dark environment. Many have developed long, needle-sharp teeth and huge mouths. Others are blind because they have no need for eyes in the pitch-black world of the abyss. Still others have large bulging eyes, and many have luminescent spots and devices that glow in the dark. This natural luminescence (light) is believed to attract prey, their mate, or both. Much has yet to be learned about these fascinating deep-sea creatures.	58
The Life Cycle in the Sea	Explain that at the shoreline, creatures of the sea live under very difficult conditions. They are subject to the extremes of drying, flooding, baking, and freezing if they are exposed when the tide rises and falls. Waves and currents may also wash these creatures of the sea upon the beach where they may die. And, of course, there are many predators for whom they become easy prey when exposed. Many sea animals that live on the edge of the sea are small, flat, or streamlined, and many have suction-type devices that hold them tightly to rocks. Starfish have hundreds of such suction cups on their five arms. Barnacles attach to underwater surfaces and excrete a chemical that acts as a cement to keep them in place the rest of their lives.	59-62
The Life Cycle in the Sea	Explain that other marine life is found in tidal pools and hollows of rocks and coral where they are sheltered from predators, and yet have life-sustaining water around them even when the tide is out. In this category are some corals, sponges, sea anemones, sea cucumbers, and sea urchins. Others live on the beaches and burrow into the sand for protection when the tide is out. Able to remain in the air from one high tide to the next, this type includes some crabs, clams, sandworms, and sand dollars, among many others.	63-64
Life in the Shallow Sea	Explain that most sea animals live in the relatively shallow water seaward of the low tide level above the continental shelf. Marine plant life (phytoplankton) is able to float over much of the continental shelf or in some instances, is able to attach itself to the bottom and remain within range of sunlight. The plants vary in size from microscopic single cells such as algae and diatoms to huge seaweed plants called kelp, which may be 150 feet long. Algae are the most common of all plants. They are a number of different colors; some float, and others attach themselves to rocks. There are also some grass-like plants. In general, the sea does not have the wide variety of plants	65-67

Chapter 6 / Section 1: NS2-M3C6S1 – Simple Life in the Seas

	found on land or the advanced members of the plant family like trees or flowering shrubs. Much of the sea and the sea floor, in fact is barren.	
Life in the Shallow Sea	Explain that where plants exist, however, there will normally be an abundance of animal life. The smallest animals of the zooplankton group are the one-celled protozoans. Jellyfish are the largest form of zooplankton. These are beautiful, transparent creatures composed of many white, blue-green, and blue cells. They often have stingers by the thousands on their lacy tentacles that can cause extreme pain, convulsions, and even death.	68-69
Life in the Shallow Sea	Explain that others in the group of tiny animals that live off phytoplankton are the larvae (young forms) of oysters, snails, and sea worms. More developed animals are the crab, shrimp, lobster, clam, oyster, squid, mussel, octopi, and scallop. These animals eat the smaller species of zooplankton and graze upon phytoplankton. Starfish and sea urchin dine on shellfish such as oyster and clam.	70-74
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	75
Review Question	The Review Question is, “List three ways sea creatures have evolved to survive at great ocean depths.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	76
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	77

III. Supplemental Activities -

A. In class Activity:

Supplies required: Handout for causes and effect flow chart

When: The in-class activity can take place during or after the discussion of upwelling.

- In-Class: Have the cadets create a cause and effect flow chart mapping upwelling

B. Take Home Activity: Using the Handout, “My life as a sea Animal”, have the cadets choose a sea animal that lives in the shallow sea. Have them write a story from the animal’s perspective describing their life and how they survive.

Include things such as:

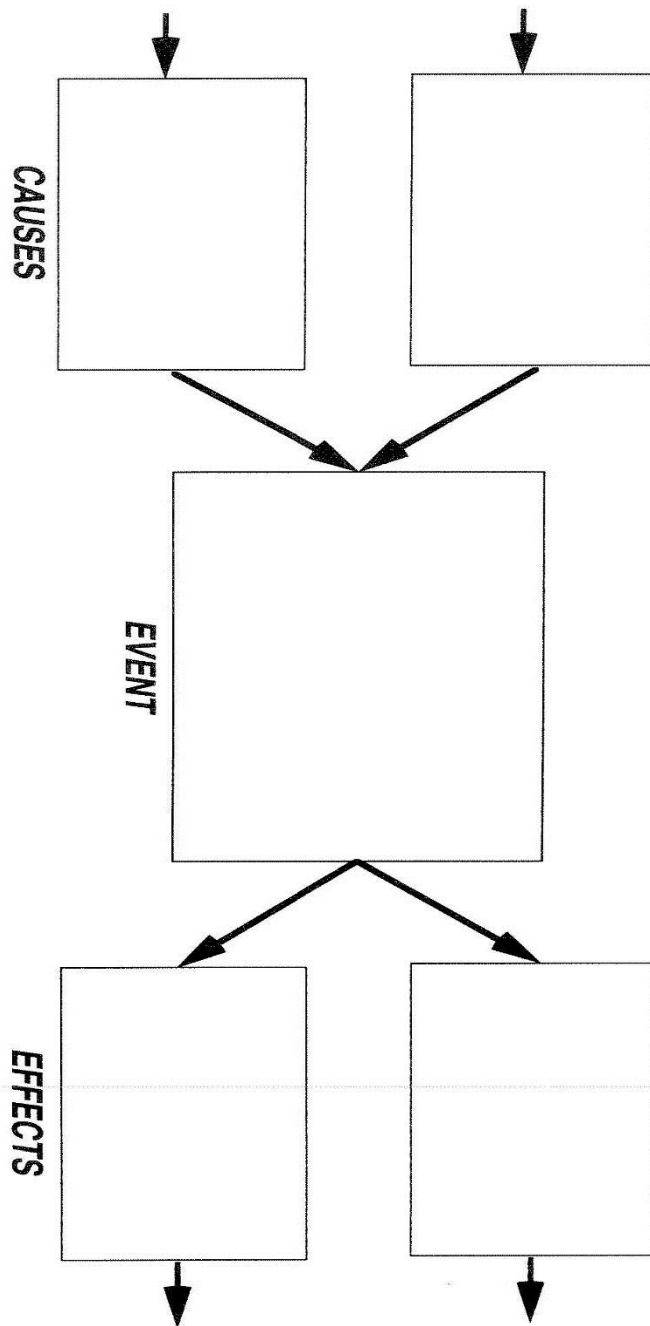
- Who you are
- What you do
- What you eat
- How you survive
- Who/what do you fear

IV. Evaluation - see CPS database for chapter test questions.

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Activity 1: In-Class Activity – Cause and Effect Flow Chart -Upwelling

Name: _____ Date: _____ Class: _____



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Activity 1: Take Home Activity – My life as a sea animal

Name: _____ Date: _____ Class: _____

Choose a sea animal that lives in the shallow sea. Write a story from the animal's perspective describing your life and how you survive. Include things such as: who you are, what you do, what you eat, how you survive, who/what do you fear

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(Section 2 of 5)

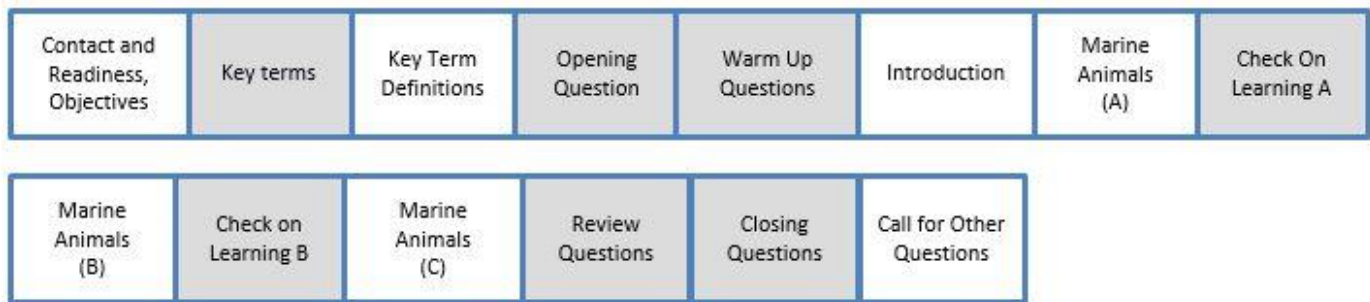
What Students Will Learn to Do:

Demonstrate an understanding of the significance of oceanographic study

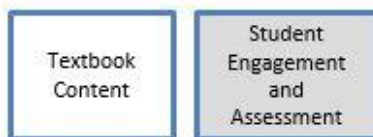
Skills and Knowledge to be Gained:

1. Describe the two major divisions of marine animals and their characteristics
2. Discuss the laws of conservation

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 9. Place a checkmark beside the NS2-M3C6S2 PowerPoint presentation, and these two CPS question deck files: NS2-M3C6S2 - Key Terms and NS2-M3C6S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 6 / Section 2: NS2-M3C6S2 – Marine Animals

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will study marine biology, the science that deals with the living, organic content of the sea. We will learn about marine plants and animal life. Our discussion of marine animals will include fish, reptiles, birds, and mammals. Did you know the polar bear is a specially-adapted marine animal? We'll also talk about some harmful marine life. Most of you are familiar with man-eating fish, but are you familiar with the fish family whose sting is as deadly as a cobra's bite? We will discuss the biological fouling and deterioration caused to Navy ships and how it affects the Navy's annual budget. Man uses the sea for food and employment, naval operations, scientific research, and many other purposes. We'll talk about some of these purposes. We will also look at some of the problems sea noises and marine life cause for our naval operations and what's being done about those problems. We will talk about the types of equipment used by man to penetrate the sea, along with the seven major groups of pollutants and their effect on marine life.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-7
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "Name three groups of marine animals, other than fish, that have jaws." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on Marine Animals.	8
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	9
Marine Animals	Explain that there are two major divisions of marine animals: those that do not have jaws, and those that do.	10
Marine Animals	Explain that only two types of jawless fish exist—the hagfish and the lamprey. The mouth of the lamprey are circular and are used to attach to their prey. The hagfish feed on dead or dying animals, but lampreys attach themselves to living fish, using their rasping tongues to make open sores from which they feed on blood and tissue.	11-13

Chapter 6 / Section 2: NS2-M3C6S2 – Marine Animals

	The sea lamprey in the Great Lakes have caused great damage to the lake trout and whiting fisheries, but in the oceans they are insignificant. The lamprey entered the Great Lakes via the St. Lawrence Seaway, illustrating how human endeavor can in some instances upset an ecological system.	
Marine Animals	Explain that there are four groups of marine animals that have jaws: fish, reptiles, birds and mammals. Fish range throughout the seas, but most live in the shallow, warmer seas. Within this group are five subgroups: (1) bottom-living fishes of both shallow and deep seas, which have large heads and whip tails; (2) large carnivorous fishes with tough, leathery skins and sharp cutting teeth, such as the sharks and rays; this group includes the largest fish—the whale shark, basking shark, and manta ray; (3) sturgeons, which have bony plates on the skin and are commercially valuable for their eggs, called caviar; (4) the largest group, which includes most commercial fishes, such as cod, herring, turbot, salmon, tuna, mackerel, flounder, bass, and many others; and (5) lungfish, three of which are freshwater types, and one called the coelacanth. This oddity, once thought to have died out some 50 million years ago, was found in the Indian Ocean in 1938. An occasional specimen has been caught from time to time since 1938.	14-19
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	20
Marine Animals	Explain that the reptile group has only a small number of species that live in the sea today. This is a far cry from the Age of Reptiles, when they were the dominant form of life in the world ocean. Reptiles are cold-blooded meaning that reptiles cannot regulate their temperatures as mammals do, so they usually inhabit warm tropical seas. There are four groups of living marine reptiles: turtles, marine iguanas, sea snakes, and a few ocean crocodiles.	21
Marine Animals	Explain that sea turtles grow to a huge size. The rare leatherback sometimes exceeds 6 feet in length and weighs over half a ton. Turtles swim with flippers. They come ashore to lay their eggs in holes dug in the sand. There, the eggs are at the mercy of many different kinds of predators. Few of the young turtles make it back to the sea before being eaten by seabirds.	22
Marine Animals	Explain that marine iguanas live only in the Galápagos Islands of Ecuador, off the west coast of South America. They are the only marine lizards. They live in large herds on the rocks near shore and feed on seaweed.	23
Marine Animals	Explain that sea snakes are poisonous, some related to cobras and kraits. They have paddle like flat tails enabling them to swim. They inhabit sheltered coastal waters, especially near river mouths, and some live in brackish water upstream. There are nearly fifty species of these poisonous snakes living in the tropical Pacific and Indian Oceans. They range from East African waters throughout southern and Southeast Asia, Oceania, Australia, and in the warm Japan Current all the way north to Japan and Korea. A few species exist along the Pacific coast of Central and South America. Although sea snakes are poisonous, they do not disturb swimmers and are said not to bite unless forcibly restrained. They feed on fish and mostly at night. This makes them dangerous to fishermen who may net them when the snakes are attracted by schools of fish and the lights of fishing boats. Asian fishermen are said to throw them from their nets with bare hands. There are a number of deaths caused by sea snakes each year.	24
Marine Animals	Explain that twenty-three species of crocodiles inhabit much of the waters of the tropical zones around the world. These include the American alligator, found in	25-26

Chapter 6 / Section 2: NS2-M3C6S2 – Marine Animals

	marshes, swamps, rivers, lakes, tidal areas, and sometimes the ocean in the southeastern United States; the American crocodile, found in southern Florida, Central America, South America, and various Caribbean islands; and 21 other species found in Asia, Africa, Australia, and other Pacific and Indian Ocean regions. They are resilient animals that have survived, basically unchanged, since prehistoric times.	
Marine Animals	Explain that they range in size from a few feet to as long as 20 feet or more. The smaller ones feed on insects, snakes, turtles, slow-moving fish, small mammals, and birds. Large adults may eat larger mammals and, on occasion, may attack unwary humans.	27
Marine Animals	Explain that the seabird group includes a number of different species. The waders live and feed along the shallows, in estuaries of rivers affected by tides, in ponds, and in mangrove swamps. Birds of the open sea, such as the albatross and petrel, live mainly in the open ocean, coming ashore only to breed. The emperor penguin lays its eggs on sea ice of Antarctica. It is the only bird that never comes ashore. There are many other varieties of penguins, all of them in the Southern Hemisphere. Seabirds feed mainly on fish. As penguins cannot fly, they catch fish by diving and swimming. Pelicans and gannets catch them by diving. Gulls and terns spot and then pounce on their prey from the air.	28-34
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	35
Marine Animals	Explain that the mammal group has a limited number of marine species, but they are some of the world's most interesting animals. They include the polar bear and sea otter, which are similar in most characteristics to land animals but are adapted to the sea. The polar bear has extra-long legs, which makes it a powerful swimmer, and a thicker coat, which insulates it against the icy waters and winds of the Arctic. Because of overhunting, there are only about 2,000 polar bears living in the wild today.	36-37
Marine Animals	Explain that the sea otter has webbed feet and is well adapted to life in the sea. It inhabits only the coastal regions of California and Alaska, where it feeds on abalone and sea urchins in the giant kelp beds. The sea otter spends most of its life at sea, sleeping, eating, and even giving birth to its young among the kelp. The sea otter was almost exterminated for its valuable pelt by the early 1900s, but strict hunting regulations have allowed it to make a good natural recovery.	38
Marine Animals	Explain that other marine mammals, however, have changed a great deal from the form they once had on land. There are three groups of marine mammals that include the sea cows, the seals, and the whales. The sea cows include the manatees of Florida and the jungle rivers of South America. The sea cow eats lily pads. It is cigar shaped with front flippers and a flat tail but no hind flippers.	39-40
Marine Animals	Explain that there are three groups of seals: the earless, or true seals; the eared seals, or sea lions; and the walrus. All seals are fish-eaters and have streamlined bodies and limbs modified to be flippers. They are fast, adept swimmers and can easily catch their prey in the water. They have a layer of thick blubber beneath the skin to protect them from the cold.	41
Marine Animals	Explain that in order to help conserve the remaining numbers of the various species of marine mammals, Congress passed the Marine Mammal Protection Act in 1972. The Act prohibits U.S. citizens from hunting any of these animals in U.S. waters or on the high seas, or from importing them and any products made from them into the United States. In 1994, certain of their numbers had increased sufficiently that the act was amended to allow for hunting by Alaskan natives for subsistence, and for commercial	42

Chapter 6 / Section 2: NS2-M3C6S2 – Marine Animals

	fishermen to kill those that were inadvertently captured or injured incidental to commercial fishing operations.	
Marine Animals	Explain that whales, dolphins, and porpoises are all air-breathing mammals that bear their young alive, nurse them, and maintain a constant body temperature. They spend their lives entirely in water and breathe through openings called blow-holes. Movement is aided by horizontally flattened tail flukes. There are two subgroups of whales: the baleen, or whalebone, whale and the toothed whale.	43-45
Marine Animals	Explain that instead of teeth, the baleen whales have a fine mesh sieve with up to 800 or more plates of baleen or whalebone that hang like a curtain from the upper jaw. When feeding, the whale opens its jaws. When the jaw closes, the baleen allows the water to flow out but keeps any collected marine life in. The main foods of the baleen whale are plankton and krill, a shrimplike animal that grows up to 2–3 inches long and is found in large numbers in Antarctic waters. Baleen whales range in size from the minke, just over 30 feet, to the blue whale, which often grows to 90 or 100 feet in length and weighs 100 tons. The giant blue whale, the largest mammal that has lived on the Earth, weighs 2 to 3 tons at birth, doubles its weight in its first week of life, and seven months later weighs about 24 tons! The largest blue whale on record was 108 feet long. From a world population of about 40,000 in 1930, there are now only a few thousand left. Some conservationists fear it is close to extinction because its death rate may soon exceed its reproductive rate.	46-49
Marine Animals	Explain that unlike baleen whales, toothed whales have teeth after birth. These teeth number from just a few in some species to as many as 250, although some may be concealed beneath the gum. The narwhal has a single long, tusklike tooth in the upper jaw. Toothed whales have one blow-hole, in contrast to the baleen, which have two. This group includes the animals commonly called dolphins or porpoises, as well as sperm whales.	50-51
Marine Animals	Explain that the sizes in this class range from the porpoise, which is about 5 feet long, to the sperm whale, which is up to 68–70 feet long. They eat fish primarily, but the sperm whale also likes the giant squid found at great depths. Records of sperm whales being entangled with submarine cables at depths to 3,700 feet indicate that some of the squid on which they feed are browsing along the bottom of the sea.	52-53
Review Question	The Review Question is, “Name up to five marine species that are, or have been at one time, on the endangered species list.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	54
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	55
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	56

Chapter 6 / Section 2: NS2-M3C6S2 – Marine Animals

III. Supplemental Activities -

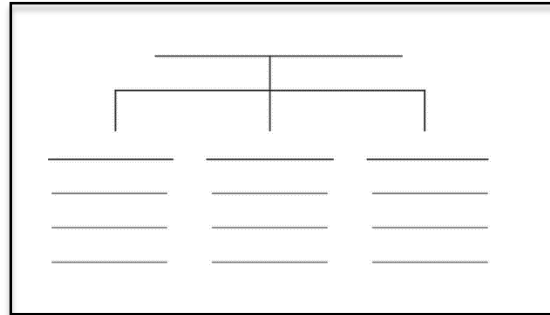
A. In class Activity:

Supplies required: Handout for take home activity

When: The in-class activity will take place as the lesson is being delivered

- In-Class: As cadets work through this lesson, a Tree Map should be completed. This Tree Map is used to classify information. It could be used in a number of ways, including using the title “marine animals” at the top or “five subgroups of fish”, “marine reptiles”. etc.

- Image of a tree map for reference:



B. Take Home Activity: Cadets will read the N.O.A.A. pdf regarding the Marine Mammal Protection Act. They will use that information to answer the questions on the handout “Marine Mammal Protection Act”.

IV. Evaluation - see CPS database for chapter test questions.



NOAA FISHERIES SERVICE



The primary objective of this management must be to maintain the health and stability of the marine ecosystem; this in theory indicates that animals must be managed for their benefit and not for the benefit of commercial exploitation. The effect of this set of requirements is to insist that the management of animal populations be carried out with the interest of the animals as the prime consideration.

– House of Representatives, No. 707, 92nd Congress, 1st Session, 18, 22 [December 4, 1971]

Office of Protected Resources and the Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972 was enacted in response to increasing concerns among scientists and the public that significant declines in some species of marine mammals were caused by human activities. The Act established a national policy to prevent marine mammal species and population stocks from declining beyond the point where they ceased to be significant functioning elements of the ecosystems of which they are a part. Nowhere else in the world had a government made the conservation of healthy and stable ecosystems as important as the conservation of individual species.

The Department of Commerce through the National Marine Fisheries Service is charged with protecting whales, dolphins, porpoises, seals, and seal lions. Walrus, manatees, otters, and polar bears are protected by the Department of the Interior through the U.S. Fish and Wildlife Service. The Animal and Plant Health Inspection Service, a part of the Department of Agriculture, is responsible for regulations managing marine mammals in captivity.

Innovative Features

In addition to shifting the focus of conservation from species to ecosystems, the Act contains many innovative features never before established in legislation. It:

- Presented a single comprehensive federal program to the place of former state-run programs;
- Included protection for population stocks in addition to species and subspecies. A population stock is “a group of marine mammals of the same species or smaller taxa in a common spatial arrangement that interbreed when mature;”
- Shifted the burden from resource managers to resource users to show that proposed taking of living marine resources would not adversely affect the resource or the ecosystem;
- Established the concept of “optimum sustainable populations” (OSP) to ensure healthy ecosystems. Prior to the Act, the management of marine species was aimed at producing a “maximum sustainable yield” (MSY) to ensure the species replenished itself for an adequate harvest in subsequent years; and
- Directed federal agencies to seek changes in international agreements, such as the Whaling Convention and the North Pacific Seal Convention corresponding to the Act.

Protection

The MMPA established a moratorium on the taking of marine mammals in U.S. waters. It defines “take” to mean “to hunt harass, capture, or kill” any marine mammal or attempt to do so. The inclusion of harassment in the definition was a groundbreaking action by Congress. Exceptions to the moratorium can be made through permitting actions for take incidental to commercial fishing and other nonfishing activities; for scientific research; and for public display at licensed institutions such as aquaria and science centers.

The moratorium generally does not apply to Alaska natives who live on the Alaskan coast. The MMPA contains provisions allowing for take for subsistence use or to create and sell “authentic articles of handicrafts and clothing” without permits or authorizations. The taking must not be “accomplished in a wasteful manner,” and the Secretaries of Commerce and the Interior may regulate the taking of a depleted species or stock, regardless of the purpose for which it is taken.

What You Can Do

People can positively affect changes in our ecosystems and help protect marine species by learning about the issues and changing behaviors. You can make a difference. Go to www.nmfs.noaa.gov/pr or www.mmc.gov to find out more about marine mammal species and stocks.

Chapter 6 / Section 2: NS2-M3C6S2 – Marine Animals

Activity 1: Take Home Activity – Marine Mammal Protection Act

Name: _____ Date: _____ Class: _____

Directions: Use the N.O.A.A. handout to answer the following questions regarding the Marine Mammal Protection Act.

1. What prompted this important policy?

2. What U.S. departments are mentioned in the handout? What does each of these departments do in terms of protecting animals?

3. What is unique about the Marine Mammal Protection Act?

4. What is a moratorium? What moratorium does this policy state? What are the exceptions?

5. What can YOU do to help protect marine animals and their ecosystems?

Chapter 6 / Section 3: NS2-M3C6S3 – Life in the Open Sea

(Section 3 of 5)

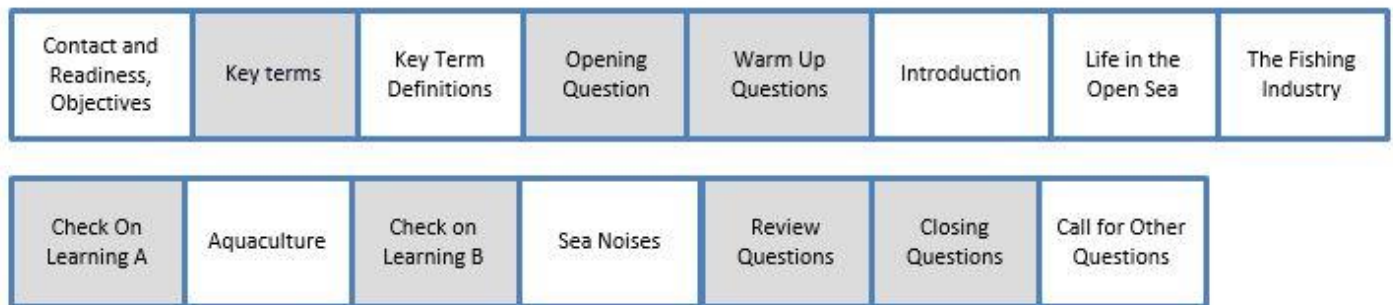
What Students Will Learn to Do:

Demonstrate an understanding of the significance of oceanographic study

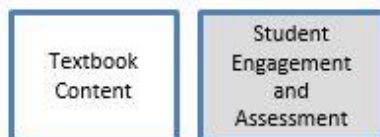
Skills and Knowledge to be Gained:

1. Describe the effects of the open sea on man
2. Cite methods used to increase stocks of commercial fish
3. Explain the marine “farming” method called aquaculture

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 6. Place a checkmark beside the NS2-M3C6S3 PowerPoint presentation, and these two CPS question deck files: NS2-M3C6S3 - Key Terms and NS2-M3C6S3 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 6 / Section 3: NS2-M3C6S3 – Life in the Open Sea

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will study marine biology—the science that deals with the living, organic content of the sea. We will learn about marine plants and animal life. Our discussion of marine animals will include fish, reptiles, birds, and mammals. Did you know the polar bear is a specially-adapted marine animal? We'll also talk about some harmful marine life. Most of you are familiar with man-eating fish, but are you familiar with the fish family whose sting is as deadly as a cobra's bite? We will discuss the biological fouling and deterioration caused to Navy ships and how it affects the Navy's annual budget. Man uses the sea for food and employment, naval operations, scientific research, and many other reasons. We'll talk about some of them. We will also look at some of the problems sea noises and marine life cause for our naval operations and what's being done about those problems. We will talk about the types of equipment used by man to penetrate the sea, along with the seven major groups of pollutants and their effects on marine life.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-7
Opening Question(Random Pick a Student – "RPS")	This Opening Question is "Name three food crops grown in manmade habitats." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on life in the open sea.	8
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	9
Life in the Open Sea	Explain that beyond the shallow waters of the continental shelf, there is much less sea life because there is little plant life. Food is scarce. The animals of the region come to the surface to feed on the limited zooplankton and smaller fish, but in general, food is hard to find.	10
Life in the Open Sea	Explain that we talked earlier of the Sargasso Sea in the central Atlantic. Here there is a great deal of floating sargassum weed, which gives the area its name. This weed floats near the surface in clumps, plainly visible to sailors traversing the area. With the	11

Chapter 6 / Section 3: NS2-M3C6S3 – Life in the Open Sea

	exception of this weed, the water of the Sargasso Sea is about the purest and clearest salt water in the world. In fact, as sea life goes, there is little life other than the tiny shrimp, fish, and crabs that live among the tangle of sargassum. Limited phytoplankton live in the area because there is almost no upwelling of nutrients from the deep sea bottom.	
Life in the Open Sea	Explain that on the edges of the currents of the sea live many of the great game fishes of the world, such as marlin, sailfish, tuna, and sharks. Especially good fishing grounds for these fish are on the fringes of the Gulf Stream along the eastern seaboard and on the Mexican coasts in both the Atlantic and Pacific. Tuna species are found throughout the world ocean as they follow the plankton communities and migrate to central ocean spawning grounds.	12
Life in the Open Sea	Explain that there are places on a continental or island shelf where the ocean floor rises much closer to the surface in high underwater plateaus. These areas have an abundance of marine vegetation for fish to feed on. These plateaus are called banks. They are the best fishing grounds in the world: the Grand Banks off Newfoundland, Georges Bank off Massachusetts, the Dogger Bank in the North Sea, and in the Pacific near Japan and Alaska.	13
The Fishing Industry	Explain that according to a recent United Nations report, some 3.8 million vessels of all sizes and 30 million people are engaged in some phase of the marine fishing industry worldwide.	14
The Fishing Industry	Explain that the annual worldwide consumption of fish and fish products from all sources is some 120 million tons. Of this, some 20 percent comes from aquaculture (fish farming). The remaining 80 percent comes from fishing in the world's oceans and inland waters. Of this, about 55 percent comes from the Pacific, 20 percent from the Atlantic, and the rest from the other world oceans and inland waters.	15
The Fishing Industry	Explain that the amount of seafood eaten annually in different parts of the world is related to eating habits that people have developed over centuries and the local standard of living. For example, in a recent year in the United States, each person ate an average of only about 15 pounds of fish and other seafoods. In Japan in the same year, the average person consumed over 80 pounds. Many other people, especially in underdeveloped countries, may eat more than that, usually in the form of fish-meal cakes purchased from major commercial fishing nations.	16
The Fishing Industry	Explain that the history of the fishing industry is part of the evolution of world commerce and the never-ending search for food. Since the beginning of the twentieth century, many improvements in fishing vessels, nets, and preservation methods have occurred. Progress made in fishing methods since 1930 alone has been greater than that made in the previous three thousand years. Three main types of new vessels have been developed: the giant purse seiner, a vessel that uses sonar equipment to locate and entrap schools of fish; the oceanic long-liners, which can fish for tuna throughout the tropical oceans; and the factory trawlers.	17-18
The Fishing Industry	Explain that the large purse seiners were designed by Americans to pursue tuna on the high seas. They are based in California but cruise the world. Their large nets can catch a whole school of tuna at one set. Many of the larger ships can carry 1,500 tons of frozen fish in their holds.	19
The Fishing Industry	Explain that the long-liners originated in Japan and South Korea. These vessels lay out from one to three floating long-lines, each more than 20 miles long and bearing baited hooks every few feet. They seek mainly to catch marlin, sailfish, and tuna.	20

Chapter 6 / Section 3: NS2-M3C6S3 – Life in the Open Sea

The Fishing Industry	Explain that the trawler fleets of the world have greatly increased, especially under Eastern European and Asian flags, and they fish the continental shelves throughout the world. Trawlers generally stay at sea for several months and bring in a catch of up to 250 tons of fish that have been automatically cleaned and stored in ice. The Japanese and Russians have developed huge fish-factory ships that process and can the catch at sea. They serve as “mother ships” to a fleet of trawlers. They deliver their products directly to foreign markets at prices that cannot be matched by fishermen with less sophisticated equipment.	21-22
The Fishing Industry	Explain that the oceans are a good source of food now, but their potential is even greater. The seas alone could provide enough protein for the entire world population of more than 6 billion people. At the present time, however, only about 1 percent of the protein in the human diet comes from the sea. Explain that a change in people’s eating habits, careful conservation and harvesting practices, and cultivation of selected kinds of marine plant and animal life could increase food production from the sea. We must be very careful, however, not to deplete the breeding stock of fish or to overfish given areas. If we do, the disaster of extinction that has occurred with some land animals may be repeated.	23-24
Check on Learning Questions A (Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	25
Aquaculture	Explain that a term used today to identify marine “farming” is aquaculture, the cultivation or raising of marine plants and animals for food. Sea farming has existed for many centuries. The ancient Romans in the Mediterranean and the Chinese and Japanese have raised oysters for more than 2,000 years. Oyster bed cultivation remains one of their main commercial marine projects. Today most of the world’s oysters come from such beds.	26
Aquaculture	Explain that an adult oyster can produce as many as 100 million eggs at one laying, but only a few oysters per million eggs survive in their natural environment. Each egg develops into a zooplankton larva and floats about for two to three weeks before settling down on a rock or other surface. People have traditionally cultivated oysters by providing old oyster shells for the larvae to settle on; these old shells are called the clutch. Predators, such as starfish, are cleared out, and the area is fenced off. In a few years the oysters are ready to be harvested.	27-28
Aquaculture	Explain that this method has been improved upon, however, because it was too slow. Previously, only the food that fell to the bottom could be eaten by the growing oysters. Now most oyster beds have been replaced by suspension cultures in which the clutch is hung from ropes attached to floating frame rafts, or to stakes driven into the bottom. This way, the oysters have access to plankton floating by in all depths, and they are safe from their bottom-dwelling enemies. Using this method, it is possible to harvest 6,400 tons of oyster meat per square kilometer in about two years. French oyster farms near Bordeaux produce 500 million oysters annually for the European market. The Japanese have increased productivity of oysters from 600 pounds per acre under natural conditions to well over 30 tons per acre under culture.	29-32
Aquaculture	Explain that even more productive is aquafarming the common mussel. Mussel cultivation near Vigo, Spain, on the Atlantic Ocean, nets an unbelievable 27,000 tons of mussel meat from each square kilometer of floating farm.	33
Aquaculture	Explain that fish farming has had a high record of success for centuries in Southeast Asia, the Philippines, Indonesia, and China. The raising of milkfish in shallow fish ponds filled with brackish water has reaped some 200 tons per square kilometer using	34-36

Chapter 6 / Section 3: NS2-M3C6S3 – Life in the Open Sea

	commercial fertilizers and more than 500 tons using human sewage as the nutrient fertilizer. In the open ocean, 7 tons is the natural production. The United Nations has figured that, in Southeast Asia alone, there are at least 5,500 square kilometers of shallow sea that could be turned over to milkfish production. Such production could supply most of the annual protein requirements of Asia.	
Aquaculture	Explain that over a thousand years ago the Chinese developed a complex ecological fish farming system that they still use today. They place six different kinds of carp into a single deep pond, knowing that each species occupies a different habitat (water depth) and consumes different food. The grass carp consumes the surface vegetation. There are two mid-water dwellers, one that eats zooplankton, the other phytoplankton. Finally, there are three bottom feeders that eat mollusks, worms, and the feces of the grass carp. This is an extremely efficient ecological system that even serves to eliminate “pollution.” The system is ancient, but it is naturally organic—and it works.	37-38
Aquaculture	Explain that Woods Hole Oceanographic Institute in Massachusetts has worked out a similar system involving algae, oysters, seaweed, abalone, sand worms, and flounder, after which clean water is returned to the sea. The main crop is oysters, with abalone and flounder as secondary crops. It is a natural sewage treatment plant. The sewage is used to grow plankton algae, which in turn provide food for oysters. The waste from the oysters is consumed by seaweeds, which is then fed to abalone. The remainder that falls to the bottom of the tank is eaten by sand worms, which are then circulated to a neighboring tank to serve as food for flounder. The system is designed to produce 1 million pounds of seafood meat annually from a one-acre production facility of fish and shellfish holding tanks, and a fifty-acre algae farm using sewage from a community of 11,000 people.	39-40
Aquaculture	Explain that in Southeast Asia, in addition to the milkfish farming described above, the people also harvest mullet, shrimp, and crab in ponds constructed by clearing mangrove swamps and diking them with mud. These are extremely productive. The small fry are first fed in a nursery pond, while algae, bacteria, worms, and other plankton are raised naturally in production ponds with the addition of fertilizer.	41
Aquaculture	Explain that when the fry get to fingerling size, they are transferred to the production ponds. There they literally gorge themselves, growing to mature size in just a few months. The average yield of such ponds is about 500 pounds per acre.	42
Aquaculture	Explain that aquaculture is not limited entirely to fish. Along the Pacific coast of Asia, people have been supplementing their diets with a variety of seaweeds for ages. It is mixed in rice dishes and used as greens and seasoning. It is highly nutritious and excellent tasting. Some giant algae have been used for centuries as fertilizer for farm crops and as cattle food. Giant kelp plants of the Pacific are processed for iodine, medicines, and a variety of other products that are used in cosmetics, textiles, ink, paper, paints, drugs, and food preservatives.	43-46
Aquaculture	Explain that Woods Hole has estimated that if only one-tenth of the 1 billion acres of available coastal wetlands worldwide (100 million acres) were converted to aquacultural development, the potential yield would equal the maximum considered naturally possible from the world’s oceans—100 million tons each year.	47
Aquaculture	Explain that commercial freshwater fish farming in the United States has become increasingly popular as well as successful since World War II. The varieties most commonly raised in ponds or basins are trout, walleyed pike, perch, and catfish. Most freshwater fish now seen in the frozen fish counters of supermarkets are products of these fish farms. Most of the pike are raised in Canada, Upper Michigan, and Wisconsin. Trout are raised throughout the country, but mostly in the mountain areas	48-49

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	and northern part of the country. Catfish and perch are raised in the South and Southwest. Aquaculture is currently the fastest-growing sector of agricultural production in the United States.	
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	50
Sea Noises	Explain that an interesting biological phenomenon in the oceans is the "deep scattering layers." Discovered in World War II, these layers have become increasingly important to mariners and oceanographers. Scientists experimenting with marine sound detection gear recorded echoes from layers some distance above the ocean floor. During daylight hours there are usually three distinct layers that remain at depths from 700 to 2,400 feet. At night they rise almost to the surface and diffuse, or they may merge into a broad band as much as 500 feet thick.	51-52
Sea Noises	Explain that after some years of research, oceanographers deduced that there seemed to be a close parallel between the layers and the daily vertical migrations of certain marine animals. Today, this theory has generally been accepted, though there is still much to be learned about the phenomenon.	53
Sea Noises	Explain that it is believed that huge concentrations of tiny planktonic animals rise toward the surface to feed on phytoplankton, and then, at daybreak, seek the dark depths for protection from sunlight and predators. It appears that the layers are composed of a wide variety of zooplankton, including tiny fish, shrimplike animals, lantern fish, fish with bladders or gas-filled bubbles, and tiny jellyfish with gas-filled floats. Biologists consider the layers to be important in explaining the distribution of life within the sea.	54
Sea Noises	Explain that these deep scattering layers create horizontal sound-reflecting bands at various depths over broad stretches of the world's oceans. Until the phenomenon was identified, it caused confusion to operators of echo-sounding devices and sonar equipment. In addition, many marine animals have sound-emitters that create a wide assortment of noises beneath the sea. A person on the surface does not hear the noises because of the frequencies and sound level at which they are transmitted, but they can become a constant din over hydrophones. Such noises must be contended with in naval operations, in particular antisubmarine operations. Hydrophone reception can be seriously hampered, as some noises are very similar to the sound transmitted by naval surface and underwater vessels. Such noises can also be psychologically stressful to sonar operators. Therefore, the Navy began a program to record and identify biological and mechanical sounds so sonar operators could be trained to distinguish between them. The Navy also started a continuing research program to design equipment that could filter out as much of this biological noise as possible.	55-59
Sea Noises	Explain that the problem of identification is complicated by the fact that the recorded sound differs according to the number of animals making noises. One croaker fish makes a drumming noise, but a dense shoal of croakers sounds like a pneumatic drill tearing up a pavement, completely drowning out the noise of any ship's propeller. The tiny snapping shrimp makes a sharp snap with its claw, but a large number of them sound like radio static.	60
Sea Noises	Explain that in recording marine animal noises, scientists identified the sounds by comparing them with more familiar land animals. They learned, for example, that porpoises and whales whistle, click, bark, and moan; barnacles slurp; black mussels	61-63

Chapter 6 / Section 3: NS2-M3C6S3 – Life in the Open Sea

	crackle; toadfish croak, growl, and whistle; weak-fish and perch produce a rapid, raspy croak; the northern puffer squeaks and coughs; and the sea robin makes a sound like fingernails being scraped over a drum.	
Sea Noises	Explain that the animals also use different means to make their sounds. Crustaceans make percussion noises with their claws. Fish usually make noises with their swim bladder, the size and species of fish determining in which way it is vibrated. Some fish also make grinding noises with their teeth or fins. It is still not known why these animals make these noises, but they probably are related to breeding, spawning, and defensive actions, among other purposes. Through the study of these noises, marine biologists hope to learn more about the behavior of these animals. Such information could be used to help improve commercial fishing practices.	64-65
Review Question	The Review Question is, “What are some of the biological sounds a sonar operator contends with?” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	66
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	67
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	68

III. Supplemental Activities -

A. In class Activity:

Supplies required: bag Lima Beans, Bag of Kidney Beans, 1 cup and 1 straw for each cadet, and handout “Fishing Log; Handout for Take Home Activity

When: In-class activity 1 will take place prior to the lesson to prepare cadets for the lesson.

In-class activity 2 will take place after the discussion on aquaculture (slide 49).

In-class activity 3 will take place after the discussion on aquaculture or at the end of the entire lesson

- In-class: Complete Activities 1-3 during the class

Activity 1: To get cadets thinking prior to the lesson, ask them to describe traditional fishing methods. Have them include technologies they have used to catch fish. Next, ask them to hypothesize how fishing has changed along with new technologies and a growing world population.

Activity 2: After the lesson have students make a double bubble map to compare and contrast traditional fishing to modern fishing.

Activity 3: Play the game

A. Divide the class into 3 or 4 groups and give each cadet a fishing log.

B. Give each group a serving bowl containing 20 kidney beans and 10 lima beans and each cadet one cup and one straw.

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Explain the game rules:

- Each student will be a “fisher” whose livelihood depends on catching fish.
- Lima beans represent halibut, and kidney beans represent salmon.
- Each fisher must catch at least two fish (large or small) in each round to survive (i.e., get enough fish to either eat or sell).
- When the fishing begins, students must hold their hands behind their backs and use the “fishing rod” (straw) to suck “fish” (beans) from the “ocean” (bowl) and deposit them into their “boat” (cup).
- The fish remaining in the ocean after each fishing season represent the breeding population, and thus one new fish will be added for every fish left in the ocean (bowl).

Play the game:

- Say “start fishing” and give the cadets 20 seconds for the first “season” of fishing.
- Have each fisher count his or her catch (beans in their cup) and record the data in the fishing log.
- Fishers who did not catch the two-fish minimum must sit out for the following round.
- Add one new fish for every fish left in the ocean (bowl).

C. Allow fishers to use their hands on the straws during the second session to represent “new technology.” After the second fishing season, give one fisher from each group a spoon or a small tea strainer representing more new fishing technology such as trawl nets, sonar equipment, etc. Continue the game for round three.

Ask, “What happened when Group ____ ran out of fish? How are the fishers going to survive now?” (One option is to move to another place in the ocean.) Allow cadets to “invade” other ocean groups when their fishing place is depleted, but don't tell them that they can do this beforehand. Fishers may either go as a group to another place in the ocean or they may disperse to other places.

Repeat fishing, recording, and replenishing fish stocks until either sustainable fishing is achieved or until all (or most) groups fish out their ocean.

Use the following sample questions to lead a discussion about the activity:

- How did you feel when you realized that you had depleted your fish stock?
- How did you feel when other fishers came to your fishing place?
- How does this activity relate to real ocean and fishery issues?
- What's missing in this game? (Other predators on the fish such as sea lions, whales, and bears; a biologist counting the fish in the population and making predictions about the impact of harvesting.)
- How do changes in technology affect the success rate of the fishery? What happens to those who are still using the old technology?

Have cadets brainstorm ways to have a sustainable fishery. What rules could be developed? (For example, limits on type of equipment allowed, amount and type of fish, shorter seasons.)

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B. Take Home Activity: Using the handout “Reflection of the Fishing Game”, have the Cadets write a reflection on the simulation done in class.

Items to include could be:

- How did you feel when you realized that you had depleted your fish stock?
- How did you feel when other fishers came to your fishing place?
- How does this activity relate to real ocean and fishery issues?
- What's missing in this game? (Other predators on the fish such as sea lions, whales, and bears; a biologist counting the fish in the population and making predictions about the impact of harvesting.)
- How do changes in technology affect the success rate of the fishery? What happens to those who are still using the old technology?

IV. Evaluation - see CPS database for chapter test questions.

FISHING LOG

Ocean Area: _____

Fishers: _____

Record your group's catch and the amount of fish left in the ocean after each season:

Season	Catch	Fish Left in Ocean
1		
2 (New technology: Hands)		

Briefly describe the status/health of your fishery:

Season	Catch	Fish Left in Ocean
3 (New technology: Spoons)		
4		

Briefly describe the status/health of your fishery now:

Chapter 6 / Section 3: NS2-M3C6S3 – Life in the Open Sea

Activity 1: Take Home Activity – Reflection of the Fishing Game

Name: _____ Date: _____ Class: _____

Directions: Write a reflection on the simulation done in class. Items to include could be:

- How did you feel when you realized that you had depleted your fish stock?
- How did you feel when other fishers came to your fishing place?
- How does this activity relate to real ocean and fishery issues?
- What's missing in this game?
- How do changes in technology affect the success rate of the fishery?
- What happens to those who are still using the old technology?

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Chapter 6 / Section 4: NS2-M3C6S4 – Bioluminescence

(Section 4 of 5)

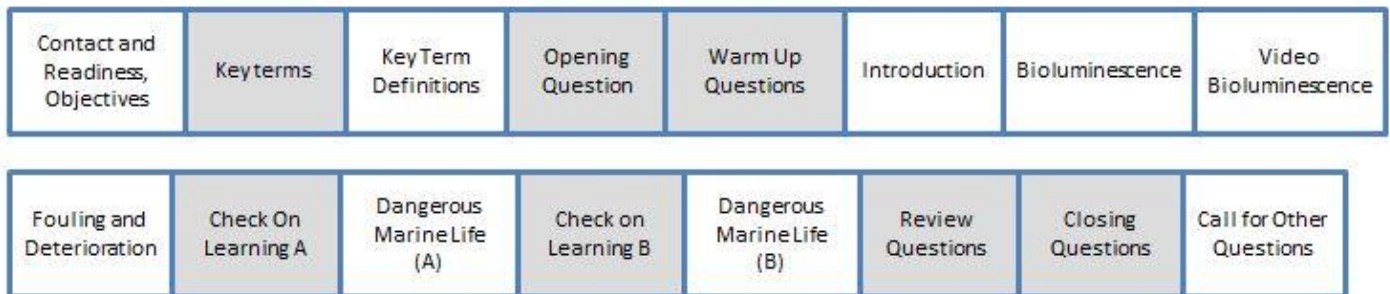
What Students Will Learn to Do:

Demonstrate an understanding of the significance of oceanographic study

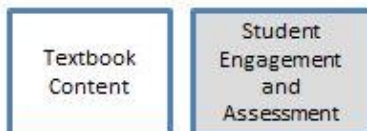
Skills and Knowledge to be Gained:

1. Describe the bioluminescence of the sea at night and its characteristics
2. Describe how biological fouling and deterioration affect the Navy's annual budget
3. Describe four categories of harmful marine animals that pose a threat to man

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 6. Place a checkmark beside the NS2-M3C6S4 PowerPoint presentation, and these two CPS question deck files: NS2-M3C6S4 - Key Terms and NS2-M3C6S4 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 6 / Section 4: NS2-M3C6S4 – Bioluminescence

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will study marine biology that is , the science that deals with the living, organic content of the sea. We will learn about marine plants and animal life. Our discussion of marine animals will include fish, reptiles, birds, and mammals. Did you know the polar bear is a specially-adapted marine animal? We'll also talk about some harmful marine life. Most of you are familiar with man-eating fish, but are you familiar with the fish family whose sting is as deadly as a cobra's bite? We will discuss the biological fouling and deterioration caused to Navy ships and how it affects the Navy's annual budget. Man uses the sea for food and employment, naval operations, scientific research, and many other reasons. We'll talk about some of the reasons. We will also look at some of the problems sea noises and marine life cause for our naval operations and what's being done about those problems. We will talk about the types of equipment used by man to penetrate the sea, along with the seven major groups of pollutants and their effects on marine life.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-9
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "What manmade structures are vulnerable to damage from gribbles?" Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on Bioluminescence.	10
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	11
Bioluminescence	Explain that luminescence means, "light created or emitted at low temperatures, not as a result of burning heat." In nature, there are at least four sources of such light: (1) mineral phosphorus (phosphorescence), (2) radioactive minerals that respond to or reflect certain wavelengths of light, (3) cool gases that can be activated by electricity (fluorescent light), and (4) bioluminescence, that is, light created by insects (fireflies), certain fishes of the abyss, and microscopic marine dinoflagellata, a single-celled phytoplankton. It is this fourth source of natural light that we will discuss here.	12-14

Chapter 6 / Section 4: NS2-M3C6S4 – Bioluminescence

Bioluminescence	Explain that the luminescence of the sea at night is one of those common, yet curious, sights of the sea. It is a bluish-green, often sparkling, glow seen in waters disturbed by bow waves, wakes, and cresting waves. In some areas of the world, this luminescence is very bright, to the extent that agitation of the sea by a passing vessel can briefly produce enough light topside to read a text. When these organisms are stimulated by waves, their rhythmic reaction looks like a swirling movement of light, much like a pinwheel. In calm conditions, the orbital movement of the seawater creates horizontal streaks where the dinoflagellata tend to concentrate. Oceanographers are constantly expanding their study of such natural bioluminescence in the sea.	15
Bioluminescence	Explain that for the Navy, this luminosity of seawater is more than just an interesting natural wonder. Observed from the air or from the bridge of a large ship, the luminous wake of a ship or periscope traveling at even moderate speed can be detected for some distance. It can clearly reveal the vessel's position and, roughly, its course and speed. During World War II amphibious landings and other naval movements were, on several occasions, given away by bioluminescence in the warm waters of the Pacific. Naval oceanographers generally know where heavy luminescence regularly occurs and can forecast periods of this phenomenon in areas where naval operations are planned.	16
Video on Bioluminescence	Show Video on Bioluminescence	17
Fouling and Deterioration	Explain that of the many important problems with which marine biology is concerned, none has greater economic significance to the Navy and commercial maritime interests than the control of marine fouling and deterioration. The effects of marine growth on ships' hulls, their saltwater intakes, valves, and piping are costly. Also important is the damage caused by marine organisms to the wood, plastics, metal, and concrete of shore installations. For the U.S. Navy alone, the protection and maintenance of ships, waterfront structures, and offshore equipment against biological deterioration and fouling costs many millions of dollars annually. More importantly, such uncontrolled fouling and deterioration can reduce the combat readiness of naval ships and shore facilities.	18-20
Fouling and Deterioration	Explain that constant scientific research has developed chemical agents that have successfully protected hull surfaces for as long as twenty-four months. The problem is far from solved, however. New naval equipment constantly requires the development of better antifouling agents.	21
Fouling and Deterioration	Explain that biological fouling impairs sonar gear by weakening sound transmissions. In some areas of the world, such fouling can make sonar gear unfit for use in just a few months. The problem is complicated by the need to develop an antifouling agent that will not itself degrade the acoustic qualities of the equipment.	22
Fouling and Deterioration	Explain that the growing use of underwater optical instruments, such as fixed television and camera lenses, has created further problems. Such lenses can be fouled in a very short time. A kind of transparent, protective coating must be developed before planned, submerged television monitoring stations can be installed.	23
Fouling and Deterioration	Explain that large stationary structures built on the continental shelf for both military and commercial projects have additional fouling problems. Offshore oil-drilling platforms, lighthouses, radar stations, and oceanographic research stations are generally intended to be permanent structures. Fouling and deterioration by bacteria, fungi, and marine animals are serious threats to such platforms.	24
Fouling and Deterioration	Explain that submarine cables containing telephone and electric power, and underwater pipelines, have been attacked by shrimplike animals called gribbles. They have gnawed through wooden pilings and rubber and plastic insulation. The famous	25

Chapter 6 / Section 4: NS2-M3C6S4 – Bioluminescence

	teredo, or “shipworm,” can destroy wooden pilings, burrow into rocks and cement, weaken stone seawalls, and destroy insulation on cables. They have even drilled through solid lead sheathing of submarine power cables laid as deep as 7,200 feet!	
Check on Learning Questions A (Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	26
Dangerous Marine Life	Explain that people generally think of danger at sea as attack by fearsome animals. Actually, animal life in the sea is usually more helpful than harmful. Nevertheless, there are two categories of marine species that can be very dangerous to humans: carnivorous and poisonous or venomous.	27
Dangerous Marine Life	Explain that sharks are the leading carnivores of most marine ecosystems. Of the 300 species identified, the larger species are the top predators in their environment. Although infrequent, the shark attack remains a significant threat for bathers along the world’s seacoasts and for people who work in the marine environment.	28-29
Dangerous Marine Life	Explain that the danger of being attacked by a shark is exaggerated in the mind of many people. The degree of hazard depends both on the location and on the numbers and condition of the individuals in the water. Sharks are unpredictable and curious and will investigate any object in the water. They are likely to attack the dead or the wounded. They have an exceptional ability to detect a disabled or wounded animal at long range. Blood in the water attracts and excites them through their sense of smell.	30-31
Dangerous Marine Life	Explain that the largest of all fish in the ocean is the tropical whale shark, which may reach more than 45 feet in length and weigh several tons. The basking shark and well-known great white shark, both found in temperate and tropical waters worldwide, may reach lengths in excess of 30 feet and 20 feet, respectively. The tiger shark averages about 10 feet in length but may reach as much as 20 feet.	32-35
Dangerous Marine Life	Explain that sharks are found in all oceans from 45 degrees north to 45 degrees south latitude. The danger of shark attack appears to be greatest in tropical and subtropical areas between latitudes of 30 degrees north and 30 degrees south. The most dangerous areas are Australia, South Africa, Cuba, and the Pacific coast of Panama. In recent times, however, an increasing number of shark attacks have occurred on all coasts of the United States, especially off Florida beaches. No one knows for certain why the numbers of these shark attacks is rising. One possible cause is that the supply of fish in offshore areas upon which the sharks normally feed may be decreasing due to pollution and overfishing. Although shark attacks can result in serious injury, they are seldom fatal unless the victim is small in size.	36-37
Dangerous Marine Life	Explain that the sharks considered most dangerous to humans are the great white shark, considered the most dangerous of all, the tiger shark, probably the most common of tropical sharks, the sand shark, native to East Indian waters, and the hammerhead shark, found throughout the oceans in both tropical and temperate zones.	38
Dangerous Marine Life	Explain that when sharks are present, humans should not dangle arms or legs in the water. Injured swimmers should be removed from the water quickly. Any flow of blood should be stopped as quickly as possible. Dark clothing and equipment are most safe for swimmers. All movements should be slow and purposeful to avoid attracting sharks. If sharks appear, swimmers should remain perfectly still. Some sharks have departed when struck on the snout, but this should be done only as a last resort because a blow to the snout could aggravate the shark.	39

Chapter 6 / Section 4: NS2-M3C6S4 – Bioluminescence

Dangerous Marine Life	Explain that barracuda are extremely dangerous. They may reach 6 to 8 feet long. They have knifelike canine teeth and, being swift swimmers, strike rapidly and ferociously. They are feared more than sharks in some areas of the West Indies. Found off the Florida coasts and in the Indian and Pacific Oceans, they are attracted by almost any bright or colored object in the water and attack quickly. Because of the poor visibility, they can be especially dangerous in murky coastal waters, where they will attack at the slightest movement.	40
Dangerous Marine Life	Explain that killer whales are found throughout the oceans, from the Arctic to the Antarctic. They are virtually fearless. They reach a length of 15 to 30 feet. In packs, they often attack much larger whales. They are very swift swimmers, seeking out seals, walruses, and penguins as prey. Despite their name, attacks against human are rare and are thought to be the result of confusion with their natural prey. The only defense against the killer whale is a hasty retreat from the water.	41-42
Dangerous Marine Life	Explain that moray eels have narrow, powerful jaws with knifelike teeth. They may reach a length of 10 feet. They can inflict severe cuts or may hold a bulldog-like grip until death. They dwell mostly in crevices and holes under rocks and coral in tropical and subtropical seas. They are common along the California coast. Morays seldom attack unless provoked, so it is very wise not to poke around in places where they may be lurking.	43
Dangerous Marine Life	Explain that the giant devil ray or manta ray may reach a spread of 20 feet and a weight of 3,500 pounds. They have a wide range in the topical seas. They are very curious and may investigate air bubbles of divers, getting entangled in the air hose. They have a very coarse skin, which will produce severe abrasion on contact. Otherwise, they usually do not attack humans.	44
Dangerous Marine Life	Explain that poisonous marine invertebrates that inflict injury by stinging are divided into four main groups: <ul style="list-style-type: none"> • Corals, sea anemones, hydroids, and jellyfish • Mollusks, including octopi and certain shellfish • Bloodworms and bristle worms • Sea urchins 	45
Dangerous Marine Life	Explain that corals and sea anemones have stinging cells that are used to capture food or as a defense against enemies. These cells inject a paralyzing drug into the victims, causing illnesses common among skin divers, sponge fishermen, and other marine workers. This group includes the elk horn coral of the West Indies and rosy sea anemones of the Atlantic.	46-47
Dangerous Marine Life	Explain that coral cuts and stings are very painful, slow to heal, and often become ulcerated. The wounds should be promptly cleaned and any particles removed. Bed rest, elevation of the limb, and packing with a mustard pack will help. When you are walking on a coral reef, heavy shoes, gloves, and wet suits are recommended.	48
Dangerous Marine Life	Explain that the hydroids include poisonous invertebrates like the Portuguese man-of-war, often erroneously called a jellyfish. The Portuguese man-of-war floats on the surface of all tropical oceans and the Mediterranean Sea. Its tentacles trail many feet into the water and can give painful stings. The fire coral, a false coral that is sometimes called stinging coral, is found among true corals in the warm waters of the tropical Pacific, Caribbean Sea, and Indian Ocean.	49-50

Chapter 6 / Section 4: NS2-M3C6S4 – Bioluminescence

Dangerous Marine Life	Explain that most jellyfish look like big, white, wispy mushrooms. They swim by water jet propulsion at many depths of the oceans. The sea wasp of the tropical seas, and especially those of the Australian, Philippine, and Indian Ocean areas, are extremely dangerous. Oftentimes they are seen in large numbers in the South China Sea.	51-52
Dangerous Marine Life	Explain that swimmers who brush against the Portuguese man-of-war and jellyfish may be stung by their threadlike tentacles. Sting symptoms may vary from a mild prickly sensation to a throbbing pain that can render the victim unconscious. Pain may remain in the area of the sting or radiate to the armpit or abdomen. There may be redness and swelling, blistering, or small skin hemorrhage. There are no specific antidotes, but washing with diluted ammonia or alcohol and swabbing with mineral oil or baking soda may help.	53-54
Dangerous Marine Life	Explain that the sea wasp jellyfish is extremely venomous. It can cause death in three to eight minutes. Symptoms are almost immediate shock, muscular cramps, loss of sensation, nausea, constriction of the throat, paralysis, convulsions, and, finally, death.	55
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	56
Dangerous Marine Life	Explain that there are two members of the mollusk group with a venomous sting or bite: (1) those with spirally twisted single shells, such as snails, and (2) those with no shell, such as the octopus and squid.	57
Dangerous Marine Life	Explain that those with cone-shaped shells are potentially dangerous. They have a head with one or two pairs of tentacles, and a flattened fleshy foot. Cone shells are favorites of shell collectors. There are some 400 species, and most have a fully developed venom apparatus. They are found in tropical waters of the Pacific and Indian Oceans and in the Red Sea. They are common on the beaches of the Pacific islands.	58
Dangerous Marine Life	Explain that the venom apparatus of the cone shell lies near the shell opening. The round teeth at the end of a tube-like appendage are thrust into the victim, and the venom is forced under pressure into the wound. The sting usually produces numbness and tingling, which quickly spread, becoming especially noticeable about the lips and mouth. Paralysis and coma may follow, with death as the result of heart failure. Explain that cone shell wounds must be quickly cleaned and suction applied to remove poison. Antibiotics may be desirable. The patient should be kept warm. Stimulants may be required, and hospitalization is recommended.	59-60
Dangerous Marine Life	Explain that the octopus has eight arms or tentacles, the squid and cuttlefish ten, around a muscular central body mass. They have parrot like beaks and well-developed venom apparatus. They can move rapidly underwater by water-jet propulsion.	61
Dangerous Marine Life	Explain that fortunately, these perilous-looking animals are timid. Octopi hide in holes in the coral and among rocks of the continental shelves. They are curious but very cautious. The danger of the octopus is its bite. A small bite can cause as much venom damage as a large one. The fear of being grabbed by eight choking arms is unfounded. Bites usually occur when captured specimens are being handled. Bleeding from a bite is profuse, indicating that clotting is retarded by the venom. A burning sensation, nausea, and swelling are likely. The victim usually recovers, but at least one death has been reported from the bite of a small, unknown variety of octopus.	62

Chapter 6 / Section 4: NS2-M3C6S4 – Bioluminescence

Dangerous Marine Life	Explain that bloodworms and bristle worms have tufted, silky bristles in a row along each side. These bristles can penetrate the skin in the same manner as cactus spines. Their strong jaws can also inflict a painful bite. The bristles and bite of a bloodworm result in a pale area that becomes hot, swollen, and numb or itchy.	63
Dangerous Marine Life	Explain that sea urchins occur in large numbers in coastal waters. They have a round body covered with needle-sharp spines, many of which are poisonous. They are a real danger to swimmers, waders, and divers. The spines, poisonous or not, can inflict deep puncture wounds. Those spines with poison are long, slender, sharp, and hollow, enabling them to penetrate deeply into the flesh. The spines are also extremely brittle and are likely to break off. The tip of the spine has tiny pincers and a sense bristle that releases the venom. This apparatus will continue to inject poison into the victim for several hours after parting from the sea urchin. Explain that penetration of the skin produces an immediate burning sensation. Redness, swelling, and generalized aching are likely to follow, and deaths from muscular paralysis have been reported.	64-65
Dangerous Marine Life	Explain that vertebrate marine animals that have venomous bites and stings include a number of fishes and sea snakes. Sea snakes were discussed earlier in this chapter. The fishes fall into a number of species: (1) the stingrays, (2) catfish, (3) weeverfish, and (4) scorpion fish.	66-67
Dangerous Marine Life	Explain that stingrays are a much-feared flat fish found in warm coastal waters. They may grow to weigh several hundred pounds. They are a serious menace to waders. They lie on the bottom, largely concealed by sand and mud. Stepping on one will result in the ray driving a venomous barbed tail into the foot or leg with great force. The spines may be driven completely through a foot or well into the leg bone of the victim. The stingray wound causes immediate shooting pain. The wound area will swell and become gray and, later, red. Severe stings by large specimens can be deadly.	68-69
Dangerous Marine Life	Explain that there are about a thousand species of catfish in the world. Some saltwater catfish are venomous. Their venom glands are located in the sheath of the dorsal and pectoral spines. Some species have curved barbs on the ends of the spines, which make venom absorption more certain. Some freshwater catfish are delicious to eat, but saltwater catfish are not often eaten. They usually inhabit rivers, open reef areas, estuaries, and large sandy bays. Catfish are common all along the eastern seaboard, the Gulf of Mexico, India, the Philippines, and Indonesia.	70-72
Dangerous Marine Life	Explain that a wound from a catfish spine results in instant stinging and throbbing. The pain may radiate or remain local, numbing an arm or leg. Asian catfish can inflict an extremely painful wound that may fester for forty-eight hours and then result in gangrene and death. There are no known antidotes for catfish and other poisonous fish stings.	73
Dangerous Marine Life	Explain that weeverfish are extremely venomous animals of the temperate zone. They are aggressive, small marine fishes less than 18 inches long. They inhabit sandy or muddy bays. They bury themselves in the mud with only their heads exposed. With little provocation, they will dart out with poisonous fins erect and strike with unerring accuracy, driving their spines into the victim.	74
Dangerous Marine Life	Explain that there is instant stabbing pain after being struck. Within thirty minutes, the pain becomes so severe that the victim may scream and thrash about wildly, then lose consciousness and die. The venom attacks both the nervous and blood systems. Immediate first aid and treatment by a doctor may save the victim's life. Recovery time takes several months, depending on the condition of the victim and the amount of venom received. There is no antivenin.	75

Chapter 6 / Section 4: NS2-M3C6S4 – Bioluminescence

Dangerous Marine Life	Explain that the great weever is found along western Africa, in the Mediterranean Sea, and around the British Isles and Norway. The lesser weever inhabits the North Sea, southward along the European coast and the Mediterranean.	76
Dangerous Marine Life	Explain that the scorpion fish family comprises the most poisonous of all fish. There are three main groups: (1) zebra fish, (2) scorpion fish, and (3) stonefish. The sting of any of these fish will produce serious results. The deadliness of some of the stonefish may be ranked with that of the cobra.	77
Dangerous Marine Life	Explain that the zebra fish, also called lionfish, is a beautiful shallow-water fish of tropical and temperate seas. They live around coral reefs, spreading their fanlike, lacy fins like peacocks. They are usually found in pairs. Beneath the beauty are hidden as many as eighteen long, straight, needle-sharp fin spines. Each spine is equipped with lethal venom. These fish are a real menace to anyone exploring tropical coral areas.	78
Dangerous Marine Life	Explain that the scorpion fish inhabits shallow water bays and reefs in the Pacific Ocean. These fishes conceal themselves in crevices among debris, under rocks, or in seaweed. They have nearly perfect protective coloration that makes them almost invisible. When alerted or removed from the water, they erect poisonous spines similar to the zebra fish.	79
Dangerous Marine Life	Explain that stonefish of the Pacific Ocean are found in tide pools and shoal areas. They are hard to see because they usually lie motionless and partially buried in the mud or sand. They are not afraid of any intrusion in their area, making them a danger to anyone with bare feet. The fish is a mud-brown color and warty like a toad. It has thirteen dorsal, three bottom, and two pelvic spines, all short and heavy with enlarged venom glands.	80-81
Dangerous Marine Life	Explain that symptoms produced by all of the scorpion fish family may vary in degree, but the pain is immediate, sharp, and radiates quickly. Pain may cause a victim to thrash about in a wild manner, scream, or lose consciousness. The immediate wound area may be pale, surrounded by a zone of redness, swelling, and heat. Paralysis of an entire arm or leg may result. Death is the usual result of a sting. A sting should be treated like a snake bite. In some cases the victim may recover after months of treatment, but with impaired general health.	82
Dangerous Marine Life	Explain that persons swimming where scorpion fish live must be alert to the danger and absolutely avoid touching them. Since the species are generally fearless, one should not aggravate them as they will attack. A direct encounter with any of the scorpion fish is an invitation to disaster.	83
Review Question	The Review Question is, "List five dangerous marine animals." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	84
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	85
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	86

Chapter 6 / Section 4: NS2-M3C6S4 – Bioluminescence

III. Supplemental Activities -

A. In class Activity:

Supplies required: Graph paper for take home activity– provided in handout for printing booklet if needed

When: The In class activity can be done as an attention getter prior to the lesson or at the end of the lesson

- Have the cadets read a story or watch a news video that discusses the killing of a Sea World trainer by an orca whale. Discuss the ethics of keeping animals such as these captive and even using them for programs such as military training.
- Below are links you can use as a source for a story or a news video:

Story: <http://news.nationalgeographic.com/news/2010/02/100225-shamu-kills-trainer-dawn-brancheau-sea-world/>

Video: <https://www.youtube.com/watch?v=9oCmweRLC8g>

B. Take Home Activity: Using the information from the Florida Museum of Natural History (link below), have cadets create a bar graph on graph paper that represents shark attacks from the years 2004-present (information is kept current). Then have the cadets write a paragraph stating any conclusions they can make from the bar graph that they created.

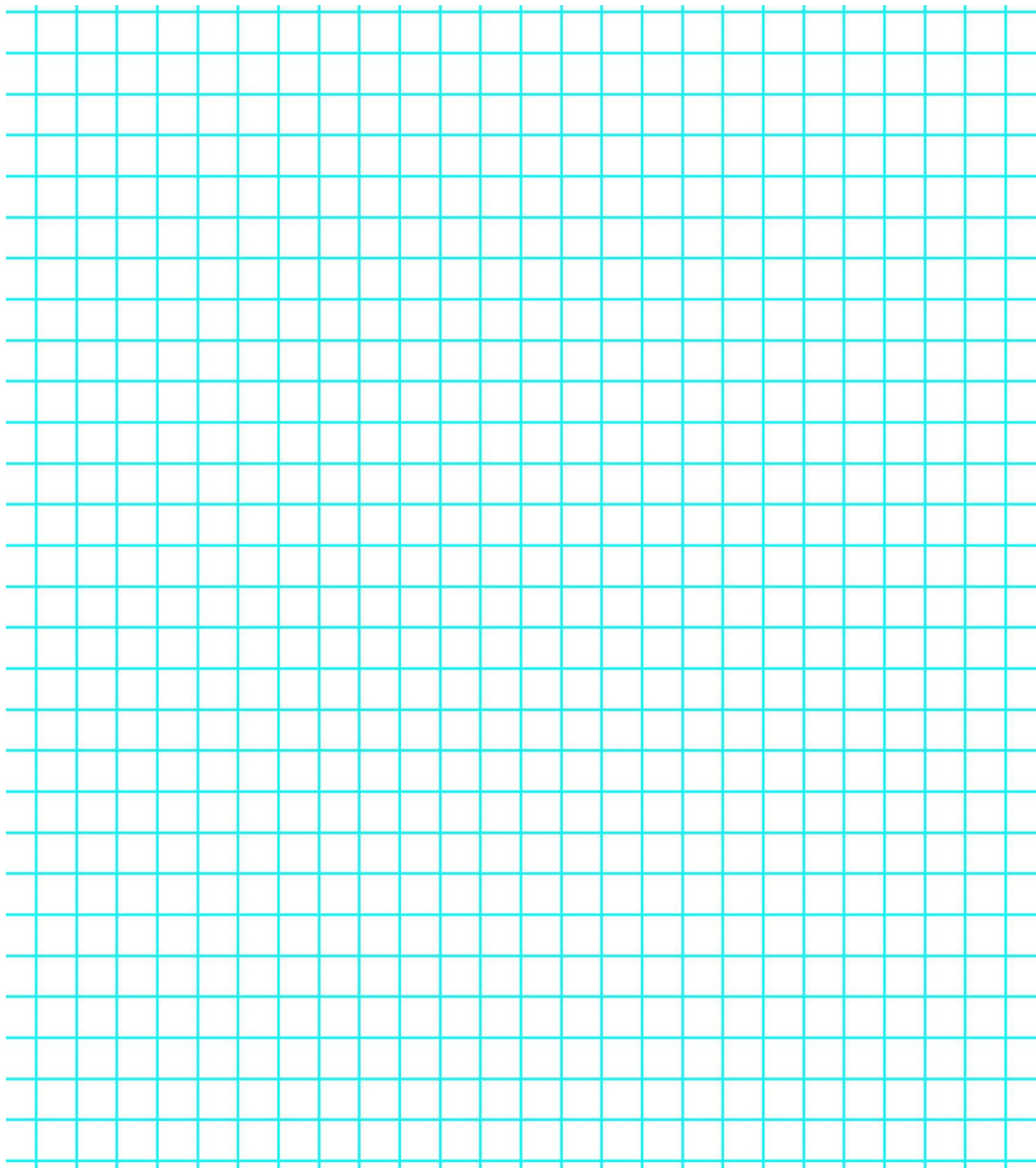
- <http://www.flmnh.ufl.edu/fish/sharks/statistics/statsw.htm>

IV. Evaluation - see CPS database for chapter test questions.

Chapter 6 / Section 4: NS2-M3C6S4 – Bioluminescence

Activity 1: Take Home Activity – Shark Attacks Bar Graph Chart

Name: _____ Date: _____ Class: _____



Chapter 6 / Section 5: NS2-M3C6S5 – Underwater Research

(Section 5 of 5)

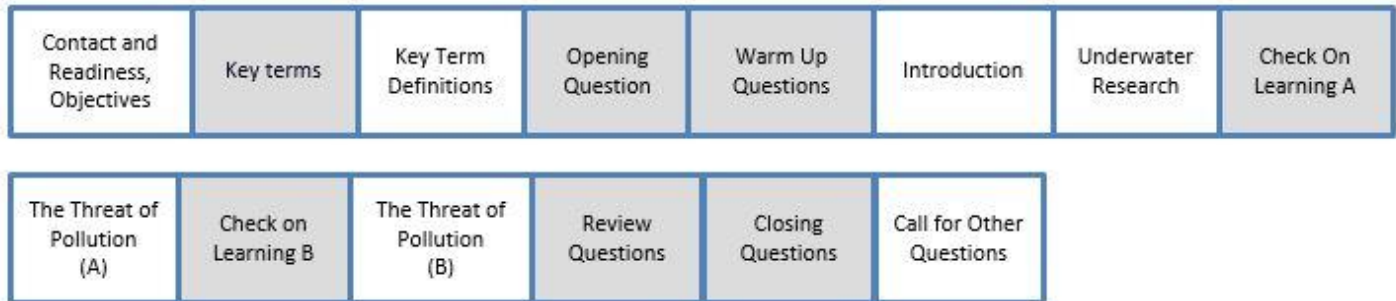
What Students Will Learn to Do:

Demonstrate an understanding of the significance of oceanographic study

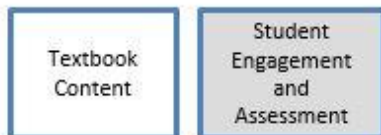
Skills and Knowledge to be Gained:

1. Describe the types of equipment used to improve man's capability to penetrate the sea
2. Describe the seven major groups of pollutants and their effects on marine life

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 5. Place a checkmark beside the NS2-M3C6S5 PowerPoint presentation, and these two CPS question deck files: NS2-M3C6S5 - Key Terms and NS2-M3C6S5 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 6 / Section 5: NS2-M3C6S5 – Underwater Research

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will study marine biology, that is, the science that deals with the living, organic content of the sea. We will learn about marine plants and animal life. Our discussion of marine animals will include fish, reptiles, birds, and mammals. Did you know the polar bear is a specially-adapted marine animal? We'll also talk about some harmful marine life. Most of you are familiar with man-eating fish, but are you familiar with the fish family whose sting is as deadly as a cobra's bite? We will discuss the biological fouling and deterioration caused to Navy ships and how it affects the Navy's annual budget. Man uses the sea for food and employment, naval operations, scientific research, and many other reasons. We'll talk about some of the reasons. We will also look at some of the problems sea noises and marine life cause for our naval operations and what's being done about those problems. We will talk about the types of equipment used by man to penetrate the sea, along with the seven major groups of pollutants and their effects on marine life.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-8
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "Name two vehicles or vessels used by aquanauts for deep sea research." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on underwater research.	9
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	10
Underwater Research	Explain that in order to see firsthand what goes on in the sea, oceanographers for years have been seeking ways to observe the depths. The lack of air, tremendous underwater pressure, complete darkness, and the cold have all combined to prevent researchers from descending into the deep ocean and remaining there for an extended time. Only in recent years have people succeeded in exploring the sea in meaningful ways. New individual diving gear and methods and advanced undersea research vehicles have been developed and successfully operated. It is a whole new scientific frontier.	11

Chapter 6 / Section 5: NS2-M3C6S5 – Underwater Research

Underwater Research	Explain that the traditional rubber-canvas suit with metal helmet and lead-filled shoes has been used successfully in depths up to 600 feet. Movement underwater is slow, and the diver is tied to a lifeline and air hose to the surface. More recently, the self-contained underwater breathing apparatus (S.C.U.B.A.) has been developed. A qualified scuba diver can carry personal compressed air tanks and swim freely, if extremely careful, into water to 200 feet deep. A diver usually uses a wet suit, flippers, and mask, especially for deeper descents and for extended underwater periods.	12-13
Underwater Research	Explain that for much deeper human exploration, oceanographer Auguste Piccard developed the bathyscaphe in 1948. The name comes from two Greek words, bathy meaning “deep” and scaph meaning “boat.” The bathyscaphe is a free-moving underwater research vessel that is somewhat like a submarine. When under the sea, scientists in a bathyscaphe can look through ports at an underwater world lighted by powerful waterproof lights. They can take photos, collect samples with mechanical arms, and stay down at great depths for long periods of time.	14-18
Underwater Research	Explain that another very interesting vessel is the F.L.I.P. (floating instrument platform) ship. This research platform can flip from a horizontal position to a vertical one. The bow, carrying a marine laboratory, remains 50 feet in the air, while the stern, containing various measuring and sounding instruments, is plunged 300 feet below the surface. All of the furniture and equipment in the laboratory section is mounted on gimbals, so it stays upright and level during the flip operation.	19
Underwater Research	Explain that another Navy project has been the development of a deep submergence rescue vessel (D.S.R.V.) to be used in case of submarine accidents.	20
Underwater Research	Explain that the Navy has also conducted extensive underwater living experiments. These have included underwater habitats—living and research quarters—where underwater scientists called aquanauts have learned to live for long periods at great depths.	21
Underwater Research	Explain that in recent years, increasing use has been made of remote-controlled self-propelled exploration vehicles fitted with TV cameras, lights, and a variety of other sensors and grappling devices. Many are capable of operation at great depths, have produced amazing video shots, and have recovered artifacts of sunken ships such as the famous passenger ship <i>Titanic</i> and the German battleship <i>Bismarck</i> .	22-24
Check on Learning Questions A (Lesson questions 3-4)	Check in on student’s understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	25
The Threat of Pollution	Explain that human beings are consumers of vast quantities of raw materials and fuels. A tremendous amount of waste material results from this use—individual, societal, industrial, and accidental. A large part of this waste finds its way into the sea. Explain that fortunately, only a small percentage of this consists of pollutants. Pollutants are substances that damage marine processes or cause loss or the restricted use of an ocean resource. Some pollutants interfere with the life processes of marine organisms and reduce biological productivity of the oceans. Others, including oil and litter, are dangerous to people, interfere with recreational activities, or detract from the beauty of the seascape.	26
The Threat of Pollution	Explain that it is impossible to completely stop pollution of the oceans. It may be possible to stop pollution of some inland lakes and rivers and to significantly reduce it in others. The mere fact that people use raw materials makes it impossible to eliminate waste materials. The real issue concerning pollutants is the level of which	27

Chapter 6 / Section 5: NS2-M3C6S5 – Underwater Research

	society is willing to accept. This depends directly on the amount of money, research, and effort people are willing to put into reduction and control of individual and industrial waste.	
The Threat of Pollution	Explain that seven main groups of pollutants presently affect the marine environment and cause international concern: (1) petroleum; (2) heavy metals; (3) radioactive materials; (4) chemical and synthetic fuels, solvents, and pesticides; (5) litter; (6) domestic sewage; and (7) biological pollutants.	28
The Threat of Pollution	Explain that the worldwide “energy crunch” came into focus in the 1970’s and will continue for the foreseeable future. Since the early 1970’s, millions of tons of crude oil, gasoline, and other petroleum products have crossed the oceans in thousands of tankers. Each year, it is estimated that more than 6 million tons of this petroleum enters the oceans. Much of it is oil washed out of fuel tanks and bilges when they are pumped, but some of it is the result of ship collisions and groundings. Oily waste from land areas can run off into the sea. Additionally, there have been terrible spills from undersea oil rigs in the North Sea, the Gulf of Mexico, the California coast, and elsewhere. During Operation Desert Storm in early 1991, crude oil was intentionally dumped into the Persian Gulf by Iraqi forces in Kuwait. These catastrophes dumped thousands of tons of oil per day into the water, creating oil slicks that covered thousands of square miles.	29-32
The Threat of Pollution	Explain that oil slicks on the high seas can kill plankton in the surface zone, but in general, it will dissipate over a period of time. Often it gathers in tarlike balls that eventually sink to the bottom. While such “oil litter” can do no good, it probably does not do much permanent harm, either. On the other hand, when such an oil slick reaches shore or collects in harbors, coves, or bays, the results are disastrous for the seabirds, mollusks, and other shallow-water life. Also, an oil spill will devastate the economy of a beach resort area.	33-34
The Threat of Pollution	Explain that the Navy’s major pollution problem in harbors, ports, channels, and U.S. waters is the discharge of oils and oily wastes. The Navy has an active program to eliminate all such pollution and works closely with the Environmental Protection Agency and the Coast Guard in this effort.	35-36
The Threat of Pollution	Explain that the sea’s main heavy metal pollutants are mercury and, to a lesser extent, barium. These metals are discharged in the effluent from chemical plants, cement works, and other manufacturing processes, doubling their natural accumulation in the sea. As a result, increased traces of mercury have been found in shellfish and other fish species throughout the world, including the Arctic Ocean and the Great Lakes. Sea life, especially shellfish, absorb the mercury. Fish, oysters, and clams retain mercury, and it continues to build up, never being cast off. In certain coastal areas near the pollution entry points, dangerous concentrations occur in the fish. This has occurred in Minimata Bay at Kyushu Island, Japan. Many people have become severely crippled and mentally ill from eating mercury-poisoned seafood caught in the bay.	37-39
The Threat of Pollution	Explain that since World War II, many countries have begun to develop nuclear power stations and fuel-processing plants to help solve their energy shortages. In theory, such plants can be made safe from leaks so they will not contaminate nearby land and water environments. The fact is, the cost for so doing is very high, and accidents have occurred. Increasing amounts of radioactive pollutants have found their way into the water.	40
The Threat of Pollution	Explain that in recent years, much concern has arisen over radioactive waste products and reactor parts dumped into the seas over the years. In some cases, old sunken sealed drums of radioactive wastes have corroded and leaked, causing contamination	41

Chapter 6 / Section 5: NS2-M3C6S5 – Underwater Research

	of local fish populations. Most countries with nuclear capabilities have agreed to dispose of future wastes in land dumps as the result of international accords dealing with this issue.	
The Threat of Pollution	Explain that chlorine, fluorine, bromine, and iodine are proving very dangerous to marine life. These compounds fall into two main groups: (1) pesticides, such as D.D.T. and other chemical weed and insect killers; and (2) the biphenols, such as aerosol propellants, solvents, refrigerants, and cleaning agents.	42-43
The Threat of Pollution	Explain that D.D.T. is known to cause reproductive problems in some marine birds. The brown pelican, for instance, is an endangered species in some areas now. When the pelicans eat fish that have absorbed D.D.T. from field and river runoff into coastal bays, their eggs have thin, flimsy shells that break in the nest.	44
The Threat of Pollution	Explain that most of the adult fish in the Great Lakes have absorbed pesticide and herbicide runoff from farmlands along the rivers that drain into the lakes. Pesticides often kill the eggs and small fry, so they have greatly reduced the natural reproduction of game fish in streams, rivers, and ponds, particularly in the upper Midwest and in the Great Lakes states. As a result, these states restock their waters annually from fish hatcheries in order to sustain fish populations.	45
The Threat of Pollution	Explain that pesticides running off from farmlands can eventually find their way into drinking water. In some recent studies more than sixty agricultural pesticides were found in the drinking water of people in fourteen states in the mid-Atlantic and southeastern regions. Especially high concentrations were found in the parts of Maryland and Virginia that border on the Chesapeake Bay. Prolonged exposure to such contamination can cause cancer in humans.	46-47
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	48
The Threat of Pollution	Explain that marine litter is solid waste of society and ships at sea. It is trucked, barged, and dumped into rivers and into the oceans at a rate of more than 6 million tons each year. The ocean floor and coastal areas are littered with this debris; much of it consists of packing materials—plastic, aluminum, wood, and glass—all of which may take centuries, at best, to be broken down by the salts of the sea. In recent years various types of medical refuse have become of particular concern. Much of this litter is not biodegradable. In other words, it will never decay and break down. Beaches all over the world are cluttered with this trash, some of which floats to the farthest ends of Earth. It is unsightly, it is a hazard to swimmers and small craft navigation, it clogs harbors, and it may destroy the natural habitat of shorebirds and animals.	49-51
The Threat of Pollution	Explain that on the sea bottom, however, some of this trash actually helps create habitats for plant and animal life. Derelict ships, car bodies and tires, and cement blocks, among other things, have been used to make artificial reefs that are eventually covered by marine growth. The vegetation brings fish, and a flourishing cycle of sea life is created where previously there may have been none. This beneficial result of litter, however, is unique and differs greatly from its usual effect on the environment.	52
The Threat of Pollution	Explain that the organic pollutants from sewage are especially troublesome in enclosed water areas. They contain high levels of nutrients that promote rapid plankton growth, in both fresh and salt water. This great increase in plankton population uses up the available oxygen, upsetting the natural ecosystem. Some 8,000 tons of sewage sludge is dumped daily from barges into the Atlantic Ocean off New York City. Many coastal areas, especially along the shores of the Mediterranean, have been contaminated by unprocessed sewage flow.	53-55

Chapter 6 / Section 5: NS2-M3C6S5 – Underwater Research

The Threat of Pollution	Explain that to help prevent pollution of inland waterways and harbors, Navy ships are equipped with two types of sewage systems: (1) marine sanitation devices (M.S.D.'s), which enable sewage to be treated before it is discharged from the ship; and/or (2) collection, holding, and transfer systems (C.H.T.'s), which collect and hold sewage until it can be transferred ashore in port or pumped overboard in unrestricted waters beyond the territorial limits (at least 12 miles from shore). Many commercial ships and most U.S. pleasure craft are fitted with similar equipment.	56-58
The Threat of Pollution	Explain that beside the foregoing types of waste pollution, in recent years various kinds of biological pollutants have also caused concern. These include both animal and plant organisms that find their way into bilge and ballast water of ships visiting foreign ports, which is then discharged into coastal and inland waters of the United States. Once released into our waterways, these organisms can grow and spread without bound due to the lack of any effective control mechanisms that may be present in their native environments. Two such instances of great concern in recent years have been the introduction of the Zebra mollusk into the Great Lakes and various rivers such as the upper Mississippi and Susquehanna by ships arriving from Europe, and a type of sprawling marine weed called hydrilla that chokes out native vegetation in the Chesapeake Bay.	59-60
The Threat of Pollution	What is the answer? Explain that one thing is very clear. If ocean pollution continues at its present pace, instead of the sea becoming the aquaculture garden of the future, it could become a biological desert. This would have grave consequences for a world that is going to become increasingly dependent on the sea for food and mineral resources. Instead of becoming a living and recreation area for millions, it could become a polluted, stagnant pool. Wastes that are disposed of in the sea must be treated before dumping so they will not pollute. We must learn to recycle wastes. We must pass effective and practical laws and then enforce them. Life on Earth is dependent on the sea and increasingly, will continue to be so.	61-63
The Threat of Pollution	Explain that there is still much hope. People are gradually learning about the importance of our relationship with the sea and the ecological balance that exists between the sea, the land, and all plant and animal life. All nations together must develop an international policy that will protect the common heritage of humanity.	64
Review Question	The Review Question is, "Name the two groups who work with the Navy to eliminate oil pollutants." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	65
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	66
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	67

Chapter 6 / Section 5: NS2-M3C6S5 – Underwater Research

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handouts for In Class and Take home Activities

When: The in-class activity will take place at the end of the lesson

- In-Class: Divide the class into seven different groups and give each small group one of the main groups of pollutants (petroleum, heavy metals, radioactive materials, chemical and synthetic fuels, solvents and pesticides, litter, domestic sewage, biological pollutants). Have each group fill out the handout for their assigned pollutant. The instructor should then make copies of all handouts for each group, so that each cadet has 7 different note taking sheets by the end of the activity.

B. Take Home Activity: Using the handout, cadets are to create a Public Service Announcement (one minute minimum) describing what citizens can do to help reduce the amount of pollutants that go into the ocean. Cadets will plan the short PSA and either video or perform the PSA for the class. See PSA planning sheet. The instructor can show PSA's using YouTube to discuss what elements are included in Public Service Announcements.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 6 / Section 5: NS2-M3C6S5 – Underwater Research

Activity 1: In-Class Activity – 7 Types of Pollutants

Name: _____ Date: _____ Class: _____

Name of Pollutant _____

1. The pollutant, _____, looks like _____

2. Some examples of this pollutant are:

3. It can enter the ocean by _____.

4. Examples of this pollutant entering the ocean has occurred when:

5. This is destructive to the ocean, animal and human life because it:

6. To ensure that this pollutant stays out of the ocean, we need to:

Chapter 6 / Section 5: NS2-M3C6S5 – Underwater Research

Activity 1: Take Home Activity – PSA Planning Sheet

Name: _____ Date: _____ Class: _____

1. What is the topic of your P.S.A.?

2. Who is your target audience?

3. What are the important facts about your topic?

4. Describe each scene of your P.S.A. and include a picture of what will be on the screen for that scene.

5. What sort of action will take place in your P.S.A.?

6. Does your P.S.A include a topic that is important to the target audience?

7. How will you persuade the audience to listen to your ideas and take action?

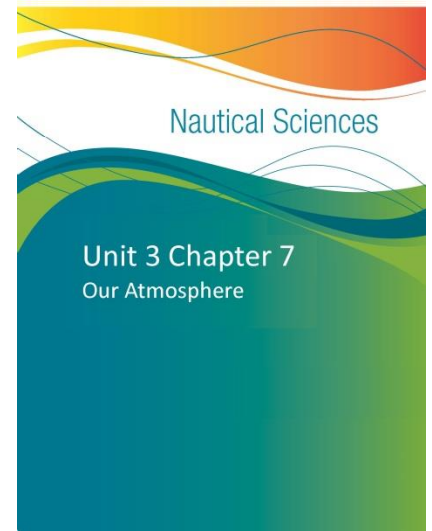
Module 3 Chapter 7: NS2-M3C7 – Meteorology

What Students Will Learn to Do:

Demonstrate a working knowledge of meteorology and how it affects us

Skills and Knowledge to be Gained:

1. Describe the aspects of the science of weather
2. Describe the significance of weather in history
3. Describe the aspects of the Earth's atmosphere
4. Describe the meaning and characteristics of the troposphere
5. Describe the meaning and characteristics of the tropopause
6. Describe the meaning and characteristics of the stratosphere
7. Describe the meaning and characteristics of the ionosphere
8. Describe the meaning and characteristics of the exosphere and magnetosphere
9. Describe the aspects of atmospheric pressure
10. Describe the fundamentals in making the weather
11. Describe the aspects in measuring temperature
12. Describe the aspects in measuring relative humidity and dew point



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...

Writing

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.3. Write narratives to develop real or imagined experiences or events using effective technique....

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

Module 3 Chapter 7: NS2-M3C7 – Meteorology

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Geography

- D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them.
- D2.Geo.9.9-12. Evaluate the influence of long-term climate variability on human migration and settlement patterns, resource use, and land uses at local-to-global scales.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...

Next Generation Science Standards (NGSS)

HS.Human Sustainability

- HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor’s Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor’s Guide.

Chapter 7 / Section 1: NS2-M3C7S1 – The Earth’s Atmosphere

(Section 1 of 2)

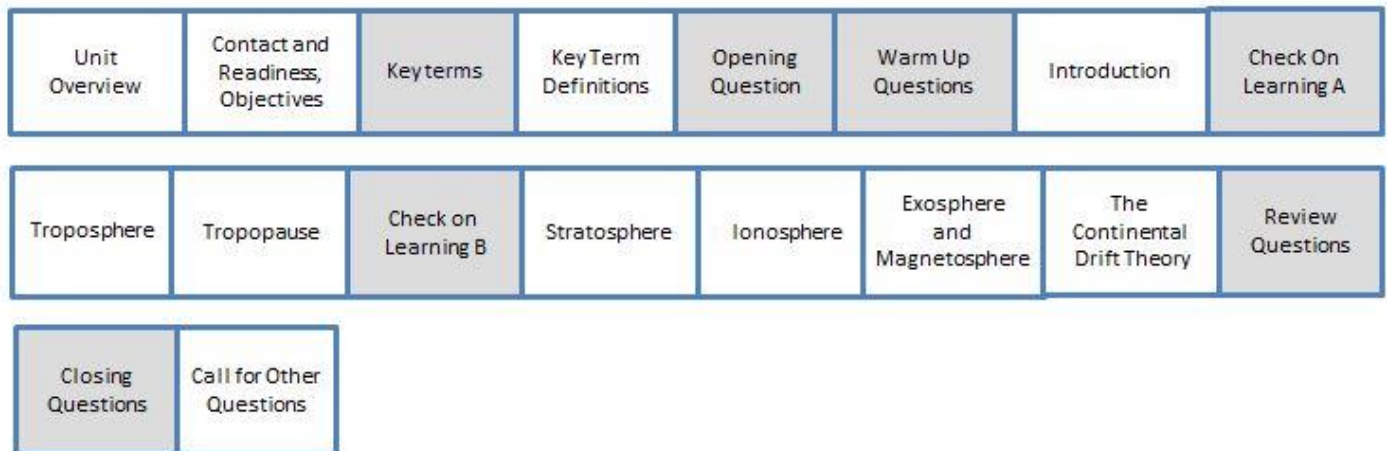
What Students Will Learn to Do:

Demonstrate a working knowledge of meteorology and how it affects us

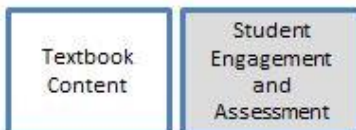
Skills and Knowledge to be Gained:

1. Describe the aspects of the science of weather
2. Describe the significance of weather in history
3. Describe the aspects of the Earth’s atmosphere
4. Describe the meaning and characteristics of the troposphere
5. Describe the meaning and characteristics of the tropopause
6. Describe the meaning and characteristics of the stratosphere
7. Describe the meaning and characteristics of the ionosphere
8. Describe the meaning and characteristics of the exosphere and magnetosphere

LESSON FLOW OUTLINE



Key:



Chapter 7 / Section 1: NS2-M3C7S1 – The Earth’s Atmosphere

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 7. Place a checkmark beside the NS2-M37S1 PowerPoint presentation, and these two CPS question deck files: NS2-M37S1 - Key Terms and NS2-M37S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Unit Overview	Explain that the men and women who “go down to the sea in ships” fight a continuous battle with the elements. At sea, the safety of a ship and her crew can depend on evasive action taken to avoid the full fury of a storm. Extra measures are taken well in advance of approaching inclement weather to minimize damage to the ship, her gear, and her cargo.	1-2
Unit Overview	Explain that we have all heard the statement, “Everybody talks about the weather, but nobody does anything about it.” In the past, this statement may have been true, but it is not today. Meteorology, that is, the science of weather, is helping to make our lives safer and easier. Storm forecasts and weather warnings are much more accurate than they have been in the past. A network of weather stations provides information for safe commercial and military flights.	3
Unit Overview	Explain that today, weather satellites in orbit above Earth provide worldwide meteorological information used in weather prediction and scientific research. Agricultural weather services help farmers plan for planting, harvesting, and marketing. Meteorology enables aircraft to take advantage of air currents, and this improves fuel conservation and flight time. There have even been successful experiments in causing rainfall. Also, meteorologists are exploring ways to break up dangerous tropical cyclones and tornadoes before they can reach populated areas.	4-6
Unit Overview	Explain that the importance of weather in history cannot be overemphasized. Weather has influenced the struggles of humanity in peace and war, since earliest times. Most people are well aware of the damage weather can do to the economy, transportation, and housing. The study of any war will show that the weather has been critical in major battles and campaigns, on both land and sea.	7
Unit Overview	Explain that meteorology has impacted history. The defeat of the Spanish Armada in 1588 by Sir Francis Drake’s small fleet was aided greatly by a serious storm in the English Channel. The brutal Russian winter was instrumental in defeating Napoleon’s invasion of that country in 1812 and Hitler’s invasion during World War II. In 1941, gales and poor visibility in the North Pacific helped the Japanese fleet move unobserved to within striking distance of Pearl Harbor.	8-10

Chapter 7 / Section 1: NS2-M3C7S1 – The Earth’s Atmosphere

Unit Overview	Explain that the D Day landings on Normandy’s coast in June, 1944 were delayed due to storm warnings. Entire artificial harbors were created to protect ships that were off-loading supplies from the fury of storms expected during the early phases of the invasion. The wet and dry monsoons of Southeast Asia determined, to a large extent, the active military operational areas during the Vietnam War. The dry and rainy seasonal patterns in Iraq, Kuwait, and Saudi Arabia greatly influenced the timing and conduct of Operations Desert Shield and Desert Storm in 1990-91.	11-12
Unit Overview	Explain that the first meteorological instrument, developed by Leonardo da Vinci in the 1400s, was a crude hygrometer, which measured moisture in the air. Galileo Galilei, an Italian scientist, invented the first simple thermometer in the late 1600s. This invention may be regarded as the first step in the development of meteorology as a science. Later in the 17 th century, barometers, wind-measuring devices, and improved thermometers and hygrometers were developed.	13-14
Unit Overview	Explain that an anemometer is any instrument for measuring the speed of wind. A barometer is any instrument that measures atmospheric pressure. A hygrometer is any instrument for measuring the water-vapor content of the atmosphere.	15
Unit Overview	Explain that synoptic meteorology is a branch of meteorology analyzing data collected simultaneously over a wide region, for the purpose of weather forecasting. A major advance in meteorology occurred in 1854-56. During this time a French astronomer named U. J. Leverrier developed a system for organizing weather observations in the Black Sea area. He found that he could locate and trace various storms from one map to another, predict their future positions, and thus make a weather forecast. This was the forerunner of synoptic meteorology. It is our modern system of observing and collecting weather data.	16
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Unit Overview	Explain that significant advances in the science of meteorology were made during the two world wars. A Norwegian meteorologist, Vilhelm Bjerknes, developed the air-mass and polar-front theories of weather. These theories are the basis for many of the forecasting rules used today. A network of reporting stations was established, and so the means of collecting data were greatly improved. As aviation advanced, air-mass frontal forecasting became highly developed. This increased knowledge became critical for safe commercial, passenger, and military flights.	17-18
Unit Overview	Explain that great progress has been made in meteorology during recent years, but much remains to be learned. Considerable amounts of money and a great deal of research time are spent every year on the weather. Today, the weather satellite is an indispensable tool of meteorologists. From its vantage point high above Earth, it sends	19

Chapter 7 / Section 1: NS2-M3C7S1 – The Earth’s Atmosphere

	back accurate photographs of cloud cover and storm fronts, and it records temperature, humidity, and other weather phenomena.	
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>This lesson will discuss the aspects of the science of weather. We will address the atmosphere and its five principal layers: the troposphere, stratosphere, mesosphere, thermosphere, and the exosphere. We will discuss the fundamentals in making the weather, along with measuring temperature, relative humidity and the dew point.</p>	20-23
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	24
Key terms - Definitions	Reinforce the correct definition for each key term.	25-32
Opening Question(Random Pick a Student – “RPS”)	<p>This Opening Question is, “Discuss the two main gases that make up the atmosphere.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on an introduction to meteorology.</p>	33
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	34
Introduction	Explain that it is not possible to understand much about weather without having a fundamental knowledge of the atmosphere around us. Actually, we live at the bottom of a vast ocean of air that completely covers the Earth. This atmosphere has major layers up to about 1,000 miles above Earth’s surface, though it is believed that traces of gaseous elements, such as helium, are present as far out as 18,000 miles.	35
Introduction	Explain that our atmosphere is a mixture of different gases. Near the surface of the Earth, the air is made up of approximately 78 percent nitrogen, 21 percent oxygen, and 1 percent argon and other gases such as carbon dioxide, hydrogen, and neon. Within the atmosphere is scattered about 1 percent water vapor, called humidity. The amount of water vapor is greater in equatorial regions and less in the polar regions.	36-38
Introduction	Explain that it is rather interesting to compare the water ocean with the air “ocean.” Water, for instance, is nearly incompressible. A cubic foot of surface water weighs about the same as a cubic foot taken from the bottom of the Marianas Trench. But this is not the case with a cubic foot of air taken from different altitudes. The higher one goes, the lighter the air becomes, and consequently the more easily compressed it is.	39
Introduction	Explain that the atmosphere thins so rapidly that over half of the total atmosphere by weight is in the first 3½ miles of atmosphere. It is within this 3½-mile “air envelope” that almost all Earth’s weather occurs. By the time a balloon has ascended to 20 miles,	40-42

Chapter 7 / Section 1: NS2-M3C7S1 – The Earth’s Atmosphere

	99 percent of the atmospheric weight and gases lie below it. Beyond 45 miles, only helium and hydrogen in very tiny amounts are present.	
Introduction	Explain that the atmosphere consists of five principal layers. From the Earth’s surface outward into space, they are the troposphere, stratosphere, mesosphere, thermosphere, and exosphere. There are also transition zones of vital importance between several of these layers. The tropopause lies between the troposphere and the stratosphere; the chemosphere or ozone layer lies mainly between the stratosphere and mesosphere. The ionosphere is the whole area encompassing the mesosphere and the thermosphere. We will talk about each of these important layers and transition zones.	43-44
Check on Learning Questions A (Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	45
Troposphere	Explain that the troposphere is the ocean of air immediately above the Earth’s surface. It extends to a height of about 11 miles above the equator, about 7½ miles in the temperate zones, and only about 5 miles above the poles. Currents, storms, and waves occur in this air ocean, much as in the seas. Air in the troposphere is constantly turning over. In fact, tropos is a Greek word meaning “changing” or “turning.” In the troposphere, the temperature and composition of gases rapidly change.	46
Troposphere	Explain that nearly all clouds are in the troposphere, so it is here that weather occurs. Air heated by the Earth rises in a process called convection and is replaced by cooler air descending from higher altitudes. As the hot air rises, the pressure decreases and the air expands and becomes less dense. When it rises, and if it cools sufficiently, it will condense into clouds and then perhaps into rain or snow. The whole process is determined by the simplest of the laws of gases: expansion is a cooling process, while compression generates heat.	47
Troposphere	Explain that the average temperature of the air at sea level is about 56 degrees Fahrenheit. At the top of the troposphere the temperature is about -85 degrees Fahrenheit. The air automatically cools about 5½ degrees for each 1,000 feet it travels upward. The reverse occurs in its descent. This automatic temperature change in rising or falling air is called adiabatic warming or cooling.	48
Troposphere	Explain that air circulation in the troposphere is of great importance to us because the circulation of air masses determines our weather. Intense study of the atmosphere in recent years has proved that the swift movement of cold-air masses about the vast Antarctic continent is a major factor in determining the world’s weather.	49
Tropopause	Explain that the tropopause is that transitional zone between the troposphere and the near void of the stratosphere. It starts just above the troposphere, at altitudes of from 5 to 11 miles, and it is divided into three overlapping areas: tropical, extratropical, and Arctic tropopauses. The area between 20,000 and 40,000 feet is of importance to air navigation. This is where the jet stream, a current of air that moves swiftly from west to east around the Earth, is located. The jet stream is most prominent above the extra-tropical and Arctic tropopause overlaps.	50-51
Tropopause	Explain that the jet stream was discovered in World War II, when B-29 bombers flying about 4 miles high found great assistance from westerly winds of up to 300 miles per hour. Planes were able to get into this stream and increase ground speed, shorten air time, and conserve fuel. Avoiding these currents on the return trip also saved time and fuel.	52

Chapter 7 / Section 1: NS2-M3C7S1 – The Earth’s Atmosphere

Tropopause	Explain that the jet streams have now been charted seasonally as well as geographically. It has been found that these winds are strongest over Japan and the New England states. Three major jet streams move over the North American continent in winter. One of them nearly blankets the United States. Information on the jet streams is especially significant to commercial airlines, which use the information in plotting their flight paths.	53-54
Tropopause	Explain that there is a direct relationship between the jet streams and lower atmospheric air masses. Meteorologists have found that the jet streams move with the cool air masses near the Earth’s surface. Thus, in winter, the streams are over the temperate zones where U.S. and Eurasian pilots can take advantage of them. However, in summer the jet streams move much farther north, out of most of the main commercial air lanes.	55
Check on Learning Questions B (Lesson questions 5-6)	Check in on students’ understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	56
Stratosphere	Explain that the stratosphere lies just above the tropopause and extends to an altitude of about 30 miles. There is almost no weather here because the air is too thin to create clouds. The temperature in the stratosphere drops much more slowly than in the lower layer. In fact, the temperature averages a fairly constant -40 degrees Fahrenheit to -50 degrees Fahrenheit and actually begins to get warmer in the upper limits. By the time a pilot has reached the stratosphere, about three-fourths of the weight of the air is below the aircraft.	57
Stratosphere	Explain that modern commercial aircraft seek to fly in the stratosphere when not using the jet streams because there is so much less air resistance. This makes much better fuel mileage possible. Pilots also favor this flying level because there is no turbulence and they can fly at top speeds.	58
Ionosphere	Explain that above the stratosphere lies an area of electrically charged particles called ions. This ionosphere begins perhaps as low as 30 or 40 miles up and extends to about 500 miles. Disturbances on the sun, such as sunspots, change the ionosphere’s form, and it is turbulent with magnetic and electrical storms. It is in the ionosphere that the Northern Lights create their dramatic display of color.	59-60
Ionosphere	Explain that it is possible to send ordinary radio waves around the world by bouncing the radio waves off ionospheric layers. In other words, the ionosphere will reflect radio waves of certain frequencies. By determining the best frequencies and times of day to transmit them, communications are greatly enhanced. This phenomenon is one with which every Navy and ham radio operator is familiar.	61
Ionosphere	Explain that the mesosphere, the lowest level of the ionosphere, extends from about 30 to 50 miles above the Earth. This layer is one of extreme temperature changes. At the lowest part of the layer the temperature may be as high as 32 degrees F. But it will drop to below -100 degrees F at the mesosphere’s upper limits. It will then start to rise again above 70 miles, as one moves into the thermosphere.	62
Ionosphere	Explain that the thermosphere is the highest level of the ionosphere. The air is extremely thin and the particles are ionized, or electrified, by loss of their electrons. This ionization is caused by the constant bombardment of cosmic rays from outer space. It is in the thermosphere that the principal radio-reflecting layers of the ionosphere are located. Extremely high temperatures exist in this layer. Recent information shows that temperatures in the thermosphere can approach 1,700 degrees F at a 300-mile altitude.	63

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Ionosphere	Explain that another very important transition zone within the broad ionospheric region, but actually starting well below it, is the chemosphere or ozone layer. Beginning at an altitude of about 15 miles, this layer shields Earth from the harmful ultraviolet rays of the sun. Ozone, a gas composed of three atoms of oxygen per molecule as opposed to the two molecules in a normal oxygen molecule, and absorbs the ultraviolet rays.	64
Ionosphere	Explain that there has been much concern in recent years that the ozone layer is being slowly depleted by fluorocarbon gas reacting with the ozone. Fluorocarbons have been widely used as propellants in aerosol cans for such products as hair spray and spray paint, and also as refrigerants in air conditioning systems in cars, homes, and businesses. As a result of this danger, many spray can and air conditioning manufacturers in the United States and elsewhere have switched to other substances, but these alternatives tend to be more expensive. Fluorocarbons are also released by the burning of styrofoam.	65
Exosphere and Magnetosphere	Explain that the topmost layer or outer fringe of the atmosphere is called the exosphere. It begins about 500 miles above the Earth’s surface and continues out to about 18,000 miles. Only the light hydrogen and helium atoms exist in the area—in atomic form because of the intense cosmic radiation. Temperatures may be as high as 4,500 degrees Fahrenheit in daylight and may drop to near absolute zero (-460 degrees Fahrenheit) at night.	66
Exosphere and Magnetosphere	Explain that within the exosphere are the intense radiation areas called the Van Allen radiation belts. These belts encircle Earth in two segments. One is about 400-3,400 miles above Earth, while the outer belt extends from about 8,000-40,000 miles out. The inner belt contains high-energy protons, and the outer belt contains high-energy electrons. Manned space missions are intentionally flown well beneath the lower limits of the Van Allen belts, and satellites operating in these regions must be shielded against the radiation encountered there. The exosphere is the end of our air ocean. Beyond the exosphere is outer space.	67-68
Exosphere and Magnetosphere	Explain that surrounding and overlapping the exosphere is the magnetosphere which is formed by the sun’s effect on the Earth’s magnetic field. The Earth’s magnetic field is distorted by the solar wind, a stream of charged particles emanating from the sun at speeds up to 900,000 miles per hour. Explain the illustration is an idealized drawing of the Earth’s magnetic field. The north pole of the Earth magnet, symbolized by the red part of the compass needle, is actually near the south pole. This is why the north ends of magnetic compasses near the Earth’s surface point in a northerly direction, since they are following the Earth’s magnetic field lines.	69-70
Exosphere and Magnetosphere	Explain that the Van Allen radiation belts, formed by charged particles trapped by the Earth’s magnetic field. They encircle the Earth like two gigantic concentric doughnuts, with radiation-free cones over the poles.	71
Review Question	The Review Question is, “Name the 5 principle layers of the earth’s atmosphere.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	72
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	73

Chapter 7 / Section 1: NS2-M3C7S1 – The Earth’s Atmosphere

Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	74
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III. Supplemental Activities -

A. In Class Activity:

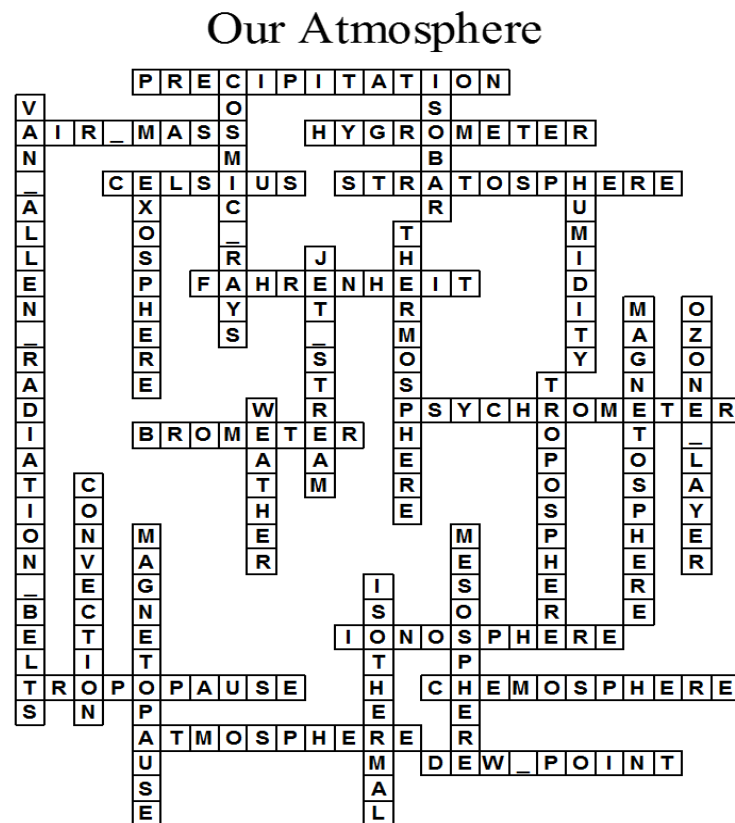
Supplies required: Handouts for In Class and Take home Activities

When: At the end of the lesson

- In class, have the cadets answer the question, “In what layer of the Earth’s atmosphere does almost all the weather occur?” using complete sentences, correct grammar and punctuation. Make sure they include their reason for reaching their conclusion.

B. Take Home Activity: Have the cadets complete the crossword puzzle found at the end of the lesson plan using the clues provided on the back side of the page. Make sure to copy the crossword puzzle and the clues to a single sheet of paper. Tell them to leave a blank space between words for answers that contain more than once word.

Answer Key:



IV. Evaluation - see CPS database for chapter test questions.

Chapter 7 / Section 1: NS2-M3C7S1 – The Earth’s Atmosphere

Activity 1: In-Class Activity – Introduction to Meteorology

Name: _____ Date: _____ Class: _____

Directions: Answer the following question using complete sentences and correct grammar and punctuation.

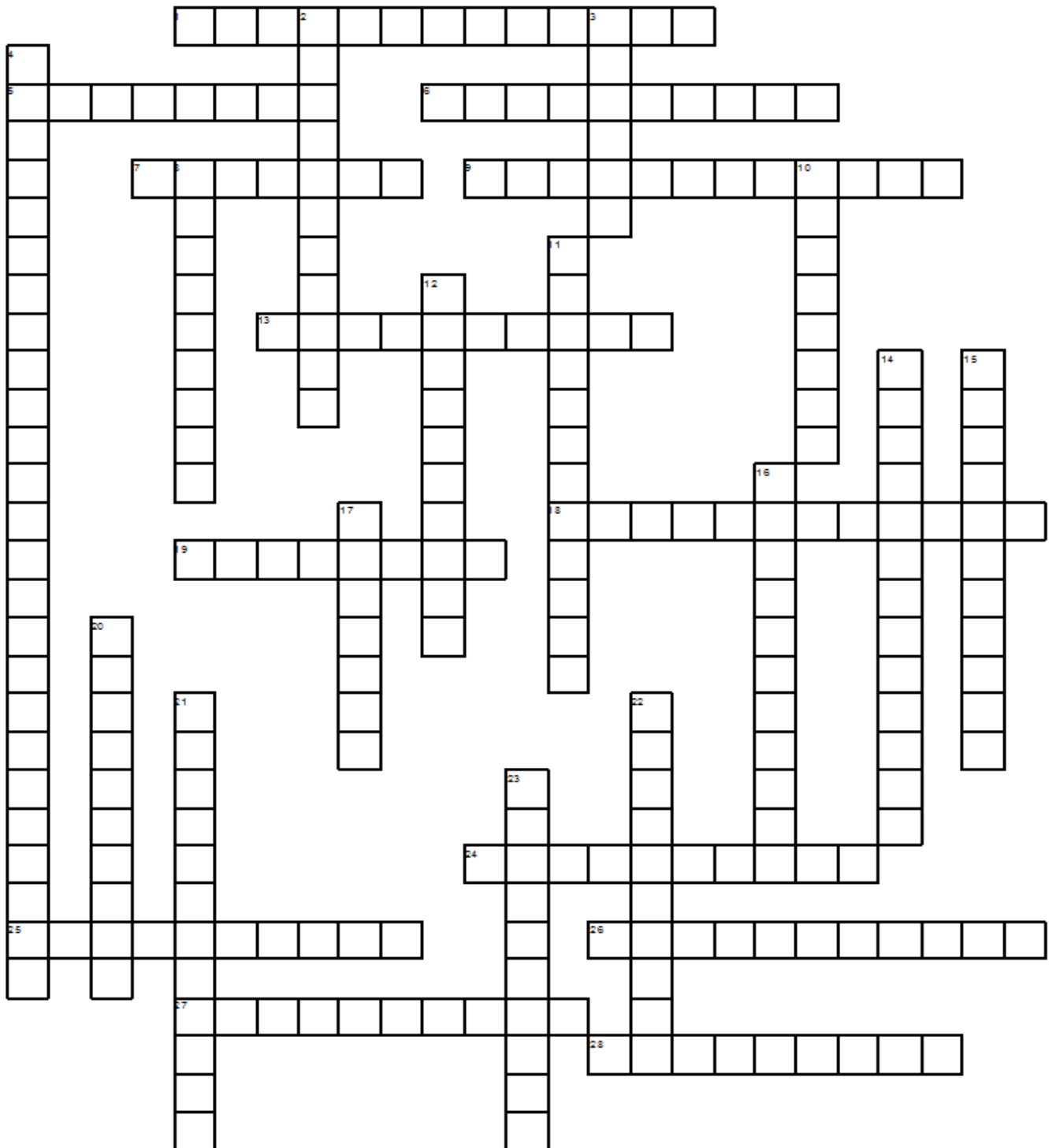
In what layer of the Earth’s atmosphere does almost all the weather occur? Include the reasoning for your decision.

Chapter 7 / Section 1: NS2-M3C7S1 – The Earth's Atmosphere

Activity1: At Home Activity – Our Atmosphere

Name: _____ Date: _____ Class: _____

Directions: Complete the puzzle using the clues provided on the back of this page. For answers containing more than one word, leave a blank space between the words.



Chapter 7 / Section 1: NS2-M3C7S1 – The Earth's Atmosphere

ACROSS

- 1 Rain, snow, sleet, dew, etc., formed by condensation of water vapor in the atmosphere
- 5 A large body of air with the same temperature and humidity
- 6 Electronic instruments use a precisely determined dew-point temperature or changes in electrical capacitance or resistance to measure and present readouts of relative humidity
- 7 Temperature scale in which 0 degrees represents the freezing point and 100 degrees represents the boiling point of water
- 9 The region of the upper atmosphere extending upward from the tropopause to about 7-30 miles above the earth; little vertical change in temperature (a fairly constant -40 to -50 degrees F)
- 13 Temperature scale in which 32 degrees represents the freezing point and 212 degrees represents the boiling point of water
- 18 An instrument for determining the atmospheric humidity by the reading of two thermometers, the bulb of one being kept moist and ventilated
- 19 Measures variations in atmospheric pressure
- 24 The region of the Earth's atmosphere between the stratosphere and the exosphere, consisting of several ionized layers and extending from about 50-250 miles above the surface of the Earth
- 25 The boundary, or transitional layer, between the troposphere and stratosphere
- 26 The region of the atmosphere characterized by chemical, photochemical activity, starting in the stratosphere and including the mesosphere and perhaps part of the thermosphere.
- 27 The gaseous envelope surrounding the Earth
- 28 The temperature to which air must be cooled, at a given pressure and water vapor content for it to reach saturation

DOWN

- 2 A radiation of high-energy particles that originates in outer space. The magnetosphere deflects harmful energetic emissions from the Sun and distant stars
- 3 A line on a weather map connecting points of equal pressure
- 4 Either of two regions of high energy-charged particles surrounding the Earth
- 8 The outer most layer of the atmosphere. extends 500 miles-18,000 miles above the surface
- 10 Amount of moisture in the air
- 11 The region of the upper atmosphere in which temperature increases continuously with altitude, extends from 50 to about 500 miles above the Earth's surface.
- 12 Strong, generally westerly winds concentrated in a relatively narrow and shallow stream in the upper troposphere of the Earth
- 14 Surrounding and overlapping the exosphere. formed by the Sun's effect on the Earth's magnetic field
- 15 The layer of the upper atmosphere where most atmospheric ozone is concentrated, from about 8-30 miles above the earth, with the maximum ozone concentration occurring at an altitude of about 12 miles.
- 16 The lowest layer of the atmosphere, within which there is a steady drop in temperature with increasing altitude; all cloud formations occur and weather conditions manifest
- 17 The condition of the atmosphere expressed in terms of its heat, pressure, wind, and moisture
- 20 Heat transfer in a gas or liquid by the circulation of currents from one region to another
- 21 Boundary between the Earth's magnetic field and the solar wind
- 22 The region between the ionosphere and the exosphere, extending from about 30-50 miles above the surface of the Earth
- 23 Pertaining to equal temperatures

Chapter 7 / Section 2: NS2-M3C7S2 – Atmospheric Pressure

(Section 2 of 2)

What Students Will Learn to Do:

Demonstrate a working knowledge of meteorology and how it affects us

Skills and Knowledge to be Gained:

1. Describe the aspects of atmospheric pressure
2. Describe the fundamentals in making the weather
3. Describe the aspects in measuring temperature
4. Describe the aspects in measuring relative humidity and dew point

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Atmospheric Pressure	Check On Learning A	What Makes the Weather (A)
Video What Makes the Weather	What Makes the Weather (B)	Measuring Temperature	Check on Learning B	Measuring Relative Humidity and Dew Point	Review Questions	Closing Questions	Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 7. Place a checkmark beside the NS2-M37S2 PowerPoint presentation, and these two CPS question deck files: NS2-M37S2 - Key Terms and NS2-M37S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 7 / Section 2: NS2-M3C7S2 – Atmospheric Pressure

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson will discuss the aspects of the science of weather. We will address the atmosphere and its five principal layers: the troposphere, stratosphere, mesosphere, thermosphere, and the exosphere. We will discuss the fundamentals in making the weather, along with measuring temperature, relative humidity and the dew point.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-11
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “What are the two main scales used to measure temperature?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on atmospheric pressure.	12
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	13
Atmospheric Pressure	Explain that the layer of atmosphere that surrounds us exerts a pressure of nearly 15 pounds per square inch at sea level. The weight of the atmosphere varies from place to place, depending on the amount of water vapor present, the temperature, and the height above Earth’s surface. Variations in atmospheric pressure are measured by a barometer.	14
Atmospheric Pressure	Explain that the Navy uses two types of barometers: mercurial and aneroid. Usually the aneroid type is employed aboard ship. The mercurial type consists of a calibrated glass tube filled with mercury. It is used at shore activities to check aneroid barometers for accuracy.	15
Atmospheric Pressure	Explain that the aneroid, or dry, barometer contains a small metallic cell that contracts when atmospheric pressure increases and expands when pressure decreases. The cell is connected to a needle, which points to a graduated scale around the face of the barometer. As the cell expands or contracts, the needle indicates the atmospheric pressure on that scale.	16
Atmospheric Pressure	Explain that barometers may be graduated in either inches of mercury or millibars. Both inches and millibars are measurements of the height of the mercury column supported at a given time. The average atmospheric pressure at the Earth’s surface is	17-18

Chapter 7 / Section 2: NS2-M3C7S2 – Atmospheric Pressure

	29.92 inches, or 1,013.2 millibars. You will often hear the barometric pressure readings given in inches of mercury on television weather forecasts. Millibars, however, are normally used on weather charts.	
Atmospheric Pressure	Explain that an air mass is a large body of air with the same temperature and humidity. An air mass takes on the characteristics of the surface over which it forms. Thus, cold-air masses originate in the cold polar regions, and warm-air masses originate in the tropics. The tropical or polar air masses can develop over either continental or maritime surfaces. These two surfaces give their names to the different kinds of air masses. Since land and sea reflect the sun's radiation differently, the two kinds of air masses have different characteristics.	19
Atmospheric Pressure	Explain that it takes more heat to change water temperature than soil temperature, and in seawater, that heat is absorbed to depths in excess of eighty feet. However, only a few top inches of soil will absorb radiation. This means that oceans are slower to warm up, and slower to cool down, than are land or continental surfaces. Maritime air, therefore, will tend to bring moderate temperatures, neither too hot nor too cold, as it moves over land areas.	20-21
Atmospheric Pressure	Explain that in the winter, the United States is swept by continental air masses from the cold Arctic. In the summer, it is swept by warm, moist maritime air masses from the Gulf of Mexico, the Caribbean Sea and the Pacific Ocean off the Mexican coast.	22
Atmospheric Pressure	Explain that when warm-air and cold-air masses touch, the boundary between them is called a front. There will usually be cloudiness and precipitation in a frontal area. A warm front is formed when a warm-air mass moves over a cold-air mass; when the reverse occurs, it is called a cold front. When neither mass advances on the other, a stationary front is said to exist.	23-25
Atmospheric Pressure	Explain that violent frontal weather systems can be predicted from a chart showing atmospheric pressures. Weather charts usually illustrate barometric pressures as millibar reading points. The lines in the figure, drawn through points of equal pressure, are called isobars. Isobars never join or cross. Some may run off the chart, but others may close, forming irregular ovals. Reporting stations send in their barometric readings to a central weather bureau, where weather charts are made. Isobars also give a rough indication of the amount of wind in an area. The closer that the isobars are to one another the stronger the wind in that area.	26-28
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	29
What Makes the Weather	Explain that weather is the condition of the atmosphere. Changes in weather are caused by changes in the air's temperature, pressure, and water vapor content; wind causes the weather to move. It can be said, therefore, that weather is the condition of the atmosphere, expressed in terms of its heat, pressure, wind, and moisture. Explain that it is heat, and the transfer of heat, that makes weather. This heat, of course, comes from the sun. Heat causes the weather changes. Without it there would be no winds, varying air pressures, storms, rain, or snow. All weather changes are caused by temperature changes in different parts of the atmosphere.	30
What Makes the Weather	Explain that there are some fundamental natural laws that determine these changes. Warm air is lighter in weight and can hold more water vapor than cold air. Cold air is heavier and has a tendency to flow toward the rising warm air, replacing it on the Earth's surface. As this air moves, wind is created, thus beginning the complex forces that cause the changing weather.	31

Chapter 7 / Section 2: NS2-M3C7S2 – Atmospheric Pressure

What Makes the Weather	Explain that our main source of energy, the sun, bombards Earth with 126 trillion horsepower each second. The Sun's energy is transmitted as electromagnetic waves, or radiation, traveling at 186,300 miles per second. The solar radiant energy is referred to as insolation (incoming solar radiation). About 43 percent of the radiation reaching our planet hits the Earth's surface and is changed into heat; the rest stays in the atmosphere or is reflected into space.	32-33
What Makes the Weather	Explain that clouds and other atmospheric influences absorb some of the incoming radiation, but they reflect much of it. A typical cloud reflects back 75 percent of the sunlight striking it. Since Earth's average cloudiness is 52 percent, about 36 percent of the total insolation never reaches our planet. Dense forests absorb up to 95 percent of the sunlight striking them, and water reflects 60-96 percent, depending upon the angle at which the light hits the surface.	34-35
What Makes the Weather	Explain that over a long period of time, the Earth's temperature remains fairly constant, despite the constant inflow of solar radiation. This tells us that the Earth is also giving off heat at about the same rate. The Earth's cloud cover acts like the glass on a greenhouse. It lets the short solar rays pass through. The Earth absorbs these and then reradiates the heat as long heat waves.	36
Video on What Makes the Weather	Show video on what makes the weather.	37
What Makes the Weather	Explain that not all long heat waves can get through the atmosphere because they are absorbed by the water vapor and they stay within the "greenhouse" in a continual cycle. You will especially notice this on hot, overcast summer nights when the humidity is high.	38
What Makes the Weather	Explain that the atmosphere acts almost like an automatic thermostat in controlling the Earth's heat. It screens out the dangerous solar radiation and reflects some of the excess, and it acts as an insulator to keep most of the heat from escaping at night. Without the atmosphere, the Earth would be like the moon—with boiling temperatures during the day and subfreezing temperatures during the night.	39
Measuring Temperature	Explain that the Navy and most civilians in America usually use thermometers with a Fahrenheit (F) scale. On that scale, the freezing point of water is 32 degrees and the boiling point is 212 degrees. Temperatures in meteorology and most other sciences, however, are usually expressed according to the Celsius (C) scale, in which the freezing point of water is 0 degrees and its boiling point is 100 degrees.	40
Measuring Temperature	Explain that the Celsius scale is in the metric system, which one day is supposed to be the principal measurement system used in the United States, as it is already in most of the rest of the world. It is likely, however, that for a good many years conversion of temperatures from one scale to the other will be a common necessity.	41
Measuring Temperature	Explain that there are 5 degrees of Celsius temperature for every 9 degrees of Fahrenheit. Since 32 degrees Fahrenheit is equivalent to 0 degrees Celsius, to change a Fahrenheit reading to Celsius you subtract 32 degrees and then multiply the remainder by 5/9 (formula: $C = 5/9[F - 32]$).	42
Measuring Temperature	Explain that to change a Celsius reading to Fahrenheit, the process is reversed. Simply multiply the Celsius temperature by 9/5, and add 32 degrees (formula: $F = 9/5 C + 32$ degrees). Using the figures from the previous example, to change 15 degrees C back to Fahrenheit, first multiply it by 9/5, which gives you 27 degrees; and then add 32 degrees. You are now back to the original 59 degrees F.	43-44

Chapter 7 / Section 2: NS2-M3C7S2 – Atmospheric Pressure

Measuring Temperature	Let's say you want to change 59 degrees F to Celsius. Subtracting 32 degrees from 59 degrees leaves 27 degrees. Multiply 27 degrees by 5/9 and you get 15 degrees C.	45
Measuring Temperature	Explain that most inexpensive house thermometers are filled with red-dyed alcohol. If you compare a mercurial thermometer with a red-alcohol one you will note that the top of the column of liquid is in the shape of a curve, called a meniscus. Because of the different characteristics of the liquids involved, the accurate reading for an alcohol thermometer is at the bottom of this curve; for a mercury thermometer it is at the top.	46
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	47
Measuring Relative Humidity and Dew Point	Explain that the atmosphere always contains water in the form of vapor. Nearly 71 percent of Earth's surface is covered by water. Heat causes the evaporation of millions of tons of water from these surfaces daily. In a process called transpiration, additional huge amounts of water enter the air from the green leaves of plants. As this warm, moist air rises, it expands and cools, eventually reaching its saturation level—100 percent relative humidity. The vapor then condenses into a liquid. The water droplets form into clouds, and precipitation (usually rain or snow) will occur. This water cycle of evaporation, condensation, and precipitation, referred to as the hydrologic cycle, is continuously in process.	48-50
Measuring Relative Humidity and Dew Point	Explain that since warm air can hold more moisture than cold air, relative humidity goes up when air with a given amount of water vapor cools, and drops when that air is heated. The dew point is the temperature to which air must be cooled—at constant pressure and constant water vapor content—to reach saturation (100 percent relative humidity). When air is cooled to its dew point temperature, small water droplets condense on objects, dew is formed.	51
Measuring Relative Humidity and Dew Point	Explain that relative humidity and dew point are measured by using a psychrometer. A psychrometer is simply two ordinary thermometers mounted together on a single strip of material.	52
Measuring Relative Humidity and Dew Point	Aboard ship, sling psychrometers are often used to speed up the process of getting accurate wet- and dry-bulb readings. A handle and chain are attached to a psychrometer and the apparatus is whirled around in order to rapidly bring the wet bulb into contact with a greater volume of air. Using a steady, slow swing, the whirling is continued until no further change can be detected in the wet-bulb reading.	53
Review Question	The Review Question is, "Describe the Greenhouse Effect and Global Warming phenomenon." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	54
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	55
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	56

Chapter 7 / Section 2: NS2-M3C7S2 – Atmospheric Pressure

III. Supplemental Activities -

A. In-Class Activity:

Supplies required: Blank Paper and Handout for Take Home Activity

When: Any time after discussing atmospheric pressure

- Using a blank sheet of paper, have the cadets name the three different units of measurements, identify who uses that unit of measurement and what those people do.
- Once they have completed have them discuss with a partner their answers.

B. Take Home Activity: Navy meteorologists use a sling psychrometer to determine the amount of moisture (humidity) in the air. Using the handout “Sling Psychrometer”, have the cadets describe the instrument in writing, how it works and the procedures to be taken to get an accurate measurement using the device.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 7 / Section 2: NS2-M3C7S2 – Atmospheric Pressure

Activity 1: Take Home Activity – Sling Psycrometer

Name: _____ Date: _____ Class: _____

Directions: Navy meteorologists use a sling psychrometer to determine the amount of moisture (humidity) in the air. Describe the instrument in writing, how it works and the procedures to be taken to get an accurate measurement using the device.

[illegible]

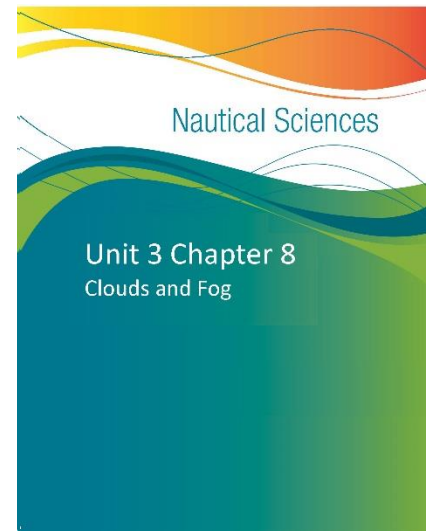
Module 3 Chapter 8: NS2-M3C8 –Clouds and Fog

What Students Will Learn to Do:

Demonstrate a working knowledge of meteorology and how it affects us

Skills and Knowledge to be Gained:

1. Describe the factors associated with cloud formation
2. Describe cloud classifications as they relate to cloud types, altitudes, classes and overall appearance
3. Describe the three types of low clouds and their characteristics
4. Describe the two types of middle clouds
5. Describe the three types of high clouds found in our atmosphere
6. Describe the factors associated when clouds are at sea
7. Explain the formation of rain
8. Describe modern rainmaking techniques
9. Describe the cloud factors associated with the formation of snow, sleet, hail, frost and dew
10. Describe the process of how fog is formed on the Earth's surface as well as hazards in relation to fog formation



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...

Writing

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.3. Write narratives to develop real or imagined experiences or events using effective technique...

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.2. Integrate multiple sources of information presented in diverse media or formats...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

Module 3 Chapter 8: NS2-M3C8 –Clouds and Fog

Next Generation Science Standards (NGSS)

HS.Space Systems

- HS-ESS1-1. Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy that eventually reaches Earth in the form of radiation.

HS.Weather and Climate

- HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

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Chapter 8 / Section 1: NS2-M3C8S1 – Clouds and Fog

(Section 1 of 1)

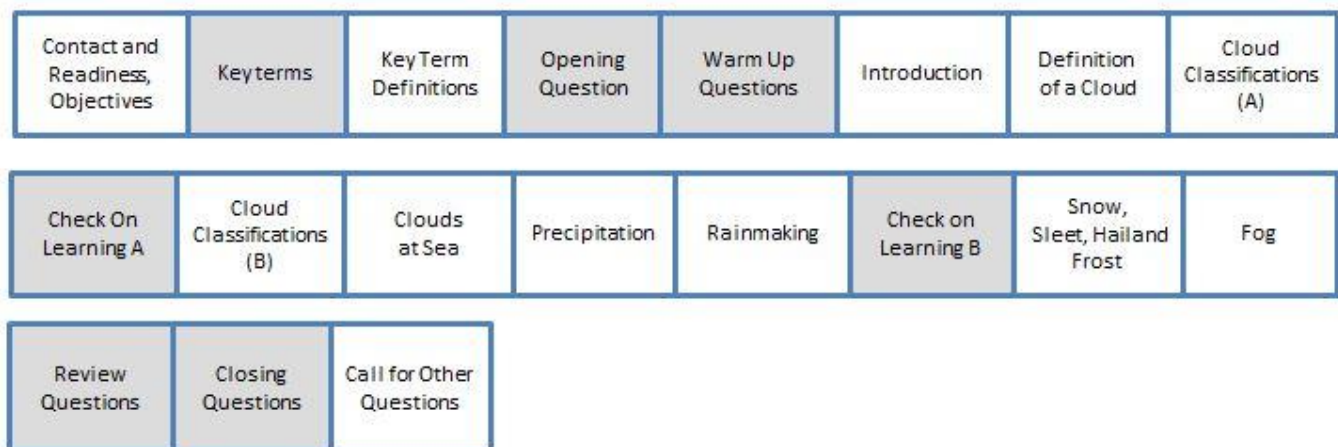
What Students Will Learn to Do:

Demonstrate a working knowledge of meteorology and how it affects us

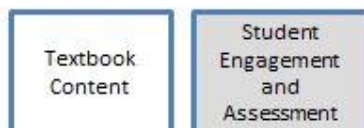
Skills and Knowledge to be Gained:

1. Describe the factors associated with cloud formation
2. Describe cloud classifications as they relate to cloud types, altitudes, classes and overall appearance
3. Describe the three types of low clouds and their characteristics
4. Describe the two types of middle clouds
5. Describe the three types of high clouds found in our atmosphere
6. Describe the factors associated when clouds are at sea
7. Explain the formation of rain
8. Describe modern rainmaking techniques
9. Describe the cloud factors associated with the formation of snow, sleet, hail, frost and dew
10. Describe the process of how fog is formed on the Earth's surface as well as hazards in relation to fog formation

LESSON FLOW OUTLINE



Key:



Chapter 8 / Section 1: NS2-M3C8S1 – Clouds and Fog

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 8. Place a checkmark beside the NS2-M3C8S1 PowerPoint presentation, and these two CPS question deck files:
NS2-M3C8S1 - Key Terms and NS2-M3C8S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>Explain that water is always present in the air, in greater or smaller amounts. It can be present in three states: solid, liquid, and vapor. In Chapter 1 we discussed water vapor in the air, called humidity. Relative humidity was defined as the percentage of the amount of vapor the air can hold at a given temperature. In this chapter, we will discuss how water vapor is formed into clouds and the kind of weather the various types of clouds may foretell. This information is vital to meteorologists, but it can also be both helpful and interesting to the average person.</p>	1-5
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	6
Key terms - Definitions	Reinforce the correct definition for each key term.	7-13
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “List 2-3 reasons why accurate weather forecasting is important.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the Introduction to clouds and fog.	14
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	15

Chapter 8 / Section 1: NS2-M3C8S1 – Clouds and Fog

Introduction	Explain that tiny particles of dust, sand, pollen from plants, factory smoke, and salt particles from oceans are always present in the air. These fragments of matter are called hygroscopic nuclei, a term meaning “particles that readily absorb moisture.” A cloud is a mass of hygroscopic nuclei that have soaked up moisture from the water vapor in the air.	16-17
Definition of a Cloud	Explain that the heat generated by the sun’s energy causes earthbound moisture to evaporate into the sky in the form of water vapor. This water vapor rises, since it is lighter than air. If the air it passes into is cold enough, the vapor condenses—in other words, it turns back into moisture. The water droplets that result from this process cling to the hygroscopic nuclei. Bunched together, these water-soaked nuclei form a cloud. Fog is formed the same way; it is a cloud very close to the ground.	18
Definition of a Cloud	Explain that as these droplets ride air currents, one of three things can happen, depending upon the temperature and wind. They may re-evaporate and rise farther into the atmosphere; they may rise and freeze into ice crystals, sometimes in sufficient amounts to form ice crystalline clouds; or they may collide with other nuclei and form larger drops that become heavy enough to fall as rain, snow, or sleet.	19
Cloud Classifications	Explain that there are three basic cloud types: cirrus (wispy), cumulus (heaped-up), and stratus (layered). In addition to the three basic types, there are other types having names that are combinations of these with the word nimbus (meaning “rain”) or the prefix alto- (meaning “high”), identifying clouds in the middle altitudes. Another prefix, fracto-, is often used to describe fragmented or windblown clouds.	20-21
Cloud Classifications	Explain that clouds are often classified in accordance with the altitudes at which they most frequently occur. The altitude classes are high, middle, or low. Sometimes a fourth class, towering, is used to identify an exceptionally high cloud with its base in the low-altitude area. Altitudes associated with each of these classes are (1) low: surface to 7,000 feet; (2) middle: 7,000 to 20,000 feet; and (3) high: above 20,000 feet.	22
Cloud Classifications	Explain that middle clouds seldom attain heights greater than 13,000 feet in the polar regions, though they may reach 23,000-45,000 feet in the temperate and tropical zones.	23
Cloud Classifications	Explain that clouds are usually named according to their appearance. Appearance, though, is largely dependent upon the altitude in which they are found. Grouped by appearance and altitude, there are ten general cloud types.	24
Cloud Classifications	Explain that low clouds include Stratus, Nimbostratus, Stratocumulus, Cumulus and Cumulonimbus	25
Cloud Classifications	Explain that there are five main types of low clouds: <i>Stratus clouds</i> , the lowest cloud type, are often like a gray layer with a uniform base. They may cause drizzle, but never rain. Fog becomes stratus when it lifts. <i>Nimbostratus clouds</i> are dark, shapeless, and rain-laden, often blanketing the sky. They are true rain clouds and “look wet” because they often have streaks of rain extending to the ground beneath them. They are often seen in the summer at the base of thunderheads. In the winter they bring steady, heavy snow.	26-27
Cloud Classifications	<i>Stratocumulus clouds</i> are irregular, rounded masses, spread out in puffy or rolling layers. These large clouds are usually gray with darker spots or shading. They do not produce rain, but they sometimes fuse at the base and change into nimbostratus. They usually precede bad weather.	28-29

Chapter 8 / Section 1: NS2-M3C8S1 – Clouds and Fog

	<i>Cumulus clouds</i> are dense, puffy clouds with a beautiful, cauliflower-like appearance. On summer days they look like giant cotton balls in the sky. They rise by day in warm air and usually disappear at night. Fleecy cumulus clouds usually mean fair weather ahead—unless the puffs begin to pile up and the dark edge of a nimbus rain cloud starts to form at the base.	
Cloud Classifications	<i>Thunderheads</i> start at almost any altitude and sometimes extend to heights of as much as 75,000 feet. <i>Cumulonimbus</i> is the name given to these clouds. They are very dense clouds of the towering variety. The base of the cloud is the dark nimbus rain cloud. Severe thunderstorms and destructive tornadoes may come from these clouds, which normally are seen only in the summer.	30
Cloud Classifications	Explain that middle clouds include <i>Alto cumulus</i> and <i>Alto stratus</i>	31
Cloud Classifications	Explain that <i>Alto cumulus</i> are gray or whitish layers of puffy, fleecy clouds. These roll-like clouds are made of water droplets, sometimes laid out in parallel bands. The Sun will sometimes produce a pale blue or yellow corona through <i>alto cumulus</i> clouds. The presence of these clouds means that rain will probably occur within twenty-four hours. Explain that <i>Alto stratus</i> clouds are dense sheets of gray or blue, sometimes looking like ridges of frosted glass, or flattened vapor trails. The Sun or Moon will glow dimly through <i>alto stratus</i> , but without a halo or corona. Light rain will probably occur within twenty-four hours.	32-33
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	34
Cloud Classifications	Explain that high clouds are composed almost entirely of tiny ice crystals. There are three basic types which include <i>cirrus</i> , <i>cirrostratus</i> , and <i>cirrocumulus</i> .	35
Cloud Classifications	Explain that <i>cirrus</i> clouds are thin, wispy clouds composed mainly of ice crystals. They are often called “mare’s tails.” In scattered patches, they normally indicate clear, cold weather. But if they are in parallel lines across the high sky, it usually signals a violent change in the weather within thirty-six hours. Spring ice storms, hurricanes, typhoons, or other severe storm conditions will generally appear soon—even if the day when you see the parallel <i>cirrus</i> is beautiful and sunny. Explain that <i>cirrostratus</i> clouds may nearly cover the sky with a filmy cloud. They often have a curly appearance at their edges. Because they are made of ice crystals, these clouds form large halos around the Sun and Moon. They indicate that clear and cold weather can be forecast.	36-37
Cloud Classifications	Explain that <i>cirrocumulus</i> clouds are thin, patchy clouds that often form in wavelike patterns. These clouds do not leave shadows on the Earth. Precipitation will usually follow them within twenty-four hours.	38
Clouds at Sea	Explain that clouds have been leading lost seamen, navigators, and explorers to land since the days of the earliest hardy sea voyagers. Fleecy white clouds on the horizon that are seemingly stationary usually indicate that an island is close by. Clouds form above islands for the same reason that they do above any land: moisture rises from vegetation, meets cooler air aloft, and condenses into clouds. In the tropics, these clouds often reflect the colors of sandy beaches or coral reefs below. Overhanging clouds may also warn seamen of rocks, reefs, or shoals surrounding islands.	39-40

Chapter 8 / Section 1: NS2-M3C8S1 – Clouds and Fog

Precipitation	Explain that precipitation (rain, snow, sleet, and hail) cannot occur without clouds. The fact that there are clouds, however, does not necessarily mean that the moisture in them will fall as a form of precipitation. Temperature and the presence of hygroscopic nuclei or ice crystals will determine whether or not there will be precipitation and what form it will take.	41
Precipitation	Explain that raindrops are formed when moist air is cooled to the point where the moisture condenses into heavy drops. Normally, droplets move about in the cloud somewhat like dust blowing. Cloud moisture droplets are very tiny—only 1/2,500 of an inch in diameter—and are too light to fall to Earth. Only if the droplet grows to a diameter of 1/125 of an inch or larger will it fall from the cloud. The average raindrop, then, is a million times larger than a cloud droplet. Cloud droplets grow to a size large enough to fall as rain or snow by combining with one another—a process called coalescence.	42-43
Precipitation	Explain that coalescence occurs in two known ways. First, bigger droplets move about slowly in the clouds, eventually bumping into other droplets and combining with them. This is usually the case when rain falls from a nimbostratus or other low cloud. Second, the more important kind of coalescence occurs when, in higher-altitude clouds (such as the middle layer of cumulonimbus), ice crystals and water droplets form near each other. The droplets evaporate, and the resulting vapor collides with the ice crystals and condenses into snow or ice pellets that fall toward Earth, melting into rain as they pass through warmer air at lower altitudes.	44
Rainmaking	Explain that rainmaking has been a concern of humans since the most ancient times. Rain dances, sacrifices, drums, cannons, and smoke have all been used to try to make rain, especially when the land was parched with drought. None of these methods worked, of course. But modern rainmaking techniques, based upon the known facts of coalescence, have been successful in causing rainfall.	45
Rainmaking	Explain that in modern rainmaking techniques, an aircraft drops dry-ice crystals or silver-iodide crystals into potential rain clouds. This process is called seeding the cloud with artificial nuclei. It has been found that one pound of frozen carbon-dioxide (dry-ice) crystals spread by airplane can start a shower from a large cumulus cloud. Silver iodide can also, using special generators, be sent up from the ground in the form of a gas—a less expensive method. Both methods cause water droplets to form around the foreign substance and then fall as rain.	46
Rainmaking	Explain that seeding, however, is not successful unless conditions are nearly right for natural rainfall. Seeding can make rain come a bit earlier and may cause more rain to fall than might have occurred naturally. It might also cause rain to fall from a cloud that, under natural conditions, would never have produced raindrops. But seeding cannot cause rain to fall from fair skies or from fair-weather cumulus clouds. Nor is it possible to cause rain to fall over a large area.	47
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	48
Snow, Sleet, Hail and Frost	Explain that sleet occurs when rain that has formed in relatively warm air falls through a layer of freezing air. The air is not quite cold enough to cause the falling rain to freeze until the rain comes in contact with a bit of dust. The dust will cause the raindrops to freeze, at least partially, into a super-cooled mush, which then freezes when it hits the ground, trees, or telephone wires. Such a sleet or ice storm can cause power lines to collapse, or tree branches to break and fall on power and telephone lines, roofs, and roads.	49

Chapter 8 / Section 1: NS2-M3C8S1 – Clouds and Fog

Snow, Sleet, Hail and Frost	Explain that hail usually occurs in the summertime. It begins as frozen raindrops in high levels of cumulonimbus thunderheads. The ice pellets may grow if updrafts of air push them upward one or more times after they are coated with water from lower cloud layers. They will eventually fall when they are too heavy to be lifted by an updraft. They may grow even more during their descent by picking up moisture that then freezes. Most hailstones are smaller than marbles, but people and animals have been killed or severely injured by hailstones as large as baseballs. Hail can destroy a growing crop in minutes.	50
Snow, Sleet, Hail and Frost	Explain that dew and frost do not fall from the skies as do rain, sleet, and snow. Dew is water vapor that condenses on objects that have cooled below the condensation point of the air around them. Frost is similar to dew, but it forms at temperatures below freezing. The water vapor changes directly into ice crystals on contact with the object, without first changing into dew.	51
Fog	Explain that what we call fog is really a low-lying cloud that is near or touching the surface of the Earth. It is formed when cool air moves in and mixes with warm air having a high relative humidity. When the temperature falls below the dew point, fog is formed. Each water droplet has a particle of dust or smoke as its central nucleus. Explain that fog formation thus requires the presence of moisture, a gentle breeze, and a combination of warm and cold temperatures. A cool breeze passing over warm waters will create fog, and so will warm air passing over a stretch of sea. The breeze will spread the fog out over the surface, and it will lie in lower areas such as valleys and swamps.	52
Fog	Explain that fog is hazardous to aviation because it limits both “ceiling” and visibility. Similarly, fog at sea—near offshore islands, along coasts, and in bays, inlets, harbors, and river mouths—is a continual hazard. Although aircraft and ships have radar to assist them in foggy conditions, the eyes of alert pilots and ship lookouts are necessary for safe navigation. Indeed, the nautical “rules of the road” explicitly require that lookouts be stationed aboard ship. And many an airplane flight has been delayed, either in landing or taking off, because of poor visibility.	53
Fog	Explain that fog at sea is frequently formed through a process known as advection (moving forward). When warm air that has passed over warm water moves to an area of colder water, fog is likely to develop. Because seawater temperatures are fairly uniform within a large area, fog often lasts for many days and nights once it develops in a given area.	54
Fog	Explain that advection fog is the name given to air-mass fog produced by air in motion or to fog formed in one place and transported by wind to another. These fogs occur when the wind moves warm, moist air from a warm ocean surface to a colder land surface—or vice versa. These fogs will normally dissipate each day, since the winds carrying the air will change direction when the Sun rises.	55
Fog	Explain that every sailor is fully aware of the fogs that can blanket the harbors and coastlines near Newport, Norfolk, New York, San Diego, Los Angeles, San Francisco, and Puget Sound. Many ships have spent hours listening to fog signals when faced with “pea soup” in harbor. It is even more difficult, however, to listen for fog signals when under way. Lookouts covering all quarters peer into gray nothingness, while the junior officer of the deck never takes his or her eyes off the radar repeater on the bridge.	56
Fog	Explain that this is a type of advection fog formed by air saturation. It occurs when cold air moves over warm water. When this happens, water evaporating from the warm surface easily saturates the cold air, thus producing the steam fog. You can produce this same effect by setting a pan of warm water out in freezing cold air. This	57

Chapter 8 / Section 1: NS2-M3C8S1 – Clouds and Fog

	type of fog occurs often in the far north, where it is called “sea smoke.” It can be seen in the late fall or winter when a river or pond “steams” as frigid air cools the water until it begins to form a coating of ice.	
Fog	Explain that this fog is caused by the heat that the Earth radiates. It forms only at night, over a land surface. This is a common type of fog, and it may cover a large area; but it usually lifts before noon, having been “burned” away by the Sun’s rays. After sunset, the Earth receives no more heat from the Sun, but the ground continues to radiate heat. The surface begins to cool, and layers of air close to the surface are cooled by conduction. If the air is sufficiently moist, it will chill to its dew point and form fog. This type of fog can be extremely hazardous for drivers. Fog patches may suddenly develop in low areas, drastically reducing visibility.	58
Fog	Explain that although weather fronts are discussed in chapter 5 of this unit, frontal fog should also be mentioned here. This fog is caused by the movement of cold-air masses. It most commonly occurs under the frontal surface of the cold-air mass and is caused by the evaporation of falling precipitation. Such a circumstance is common in December or January when a warm front (the midwinter thaw) is caught between the normal cold weather of winter and a new cold front, which pushes the warm air ahead of it over cold ground. In the upper Midwest this results in “case weather” with very heavy, wet fog dampening the air, melting snow, and causing extremely dreary days.	59
Review Question	The Review Question is, “Discuss two techniques used in modern rain-making.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	60
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	61
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	62

Chapter 8 / Section 1: NS2-M3C8S1 – Clouds and Fog

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handout for Take Home activity

When: Anytime during or at the end of the lesson

- Have the cadets answer the questions and have a class discussion based on the answers.
 1. How does fog form?
 2. What is happening to that air mass that makes the fog disappear?

B. Take Home Activity: Using the handout – CLOUDS, have the cadets create their own cloud chart of the 10 general types of clouds. Make sure they are grouped by altitude: Low, Middle, High and Towering. Include a graphic illustrating what each cloud looks like and the weather associated with each type of cloud.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 8 / Section 1: NS2-M3C8S1 – Clouds and Fog

Activity1: Take Home Activity – CLOUDS

Name: _____ Date: _____ Class: _____

Directions: Create your own cloud chart of the 10 general types of clouds. Group them by altitude: Low, Middle, High and Towering. Include a graphic illustrating what each cloud looks like and the weather that is associated with each type of cloud.

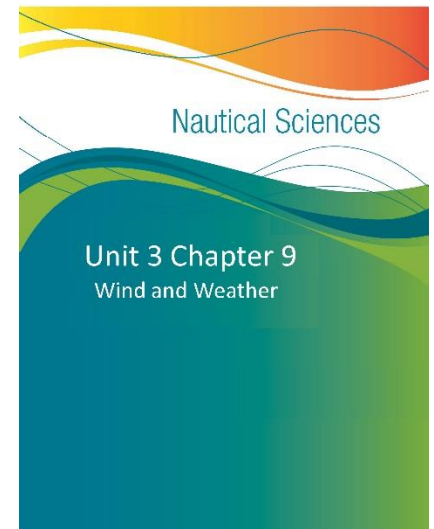
Module 3 Chapter 9: NS2-M3C9 – Wind and Weather

What Students Will Learn to Do:

Demonstrate a working knowledge of meteorology and how it affects us

Skills and Knowledge to be Gained:

1. Describe the conditions that cause wind movements
2. Describe the effect of the Earth's rotation on wind movement
3. Describe the characteristics of prevailing winds around the Earth
4. Describe the effects of the Earth's revolution and inclination movement on our weather patterns
5. Describe the secondary wind circulation patterns on the Earth
6. Describe the characteristics of high-pressure areas
7. Describe the characteristics of low-pressure areas
8. Describe the characteristics of mountain winds
9. Describe the characteristics of valley-wind systems
10. Describe the type of monsoons in Southeast Asia
11. Describe the Beaufort Scale and how it is used



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...

Writing

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.2. Integrate multiple sources of information presented in diverse media or formats...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

Module 3 Chapter 9: NS2-M3C9 – Wind and Weather

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

Chapter 9 / Section 1: NS2-M3C9S1 – Wind and Weather

(Section 1 of 1)

What Students Will Learn to Do:

Demonstrate a working knowledge of meteorology and how it affects us

Skills and Knowledge to be Gained:

1. Describe the conditions that cause wind movements
2. Describe the effect of the Earth's rotation on wind movement
3. Describe the characteristics of prevailing winds around the Earth
4. Describe the effects of the Earth's revolution and inclination movement on our weather patterns
5. Describe the secondary wind circulation patterns on the Earth
6. Describe the characteristics of high-pressure areas
7. Describe the characteristics of low-pressure areas
8. Describe the characteristics of mountain winds
9. Describe the characteristics of valley-wind systems
10. Describe the type of monsoons in Southeast Asia
11. Describe the Beaufort Scale and how it is used

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	Wind and the Earth's Rotation	Prevailing Winds
Check On Learning A	Wind and the Earth's Revolution	Secondary Wind Circulation	Highs	Lows	Check on Learning B	Mountain Winds	Fog
Monsoons	Winds and the Beaufort Wind Scale	Review Questions	Closing Questions	Call for Other Questions			

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 9 / Section 1: NS2-M3C9S1 – Wind and Weather

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 9. Place a checkmark beside the NS2-M3C9S1 PowerPoint presentation, and these two CPS question deck files:
NS2-M3C9S1 - Key Terms and NS2-M3C9S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>Personnel aboard ship, aviators, and their support personnel must always beware of the wind and its consequences. The wind is an important factor in sea and air transportation. In this lesson we will address the following: wind as air in motion, characteristics of prevailing winds around the Earth, effects of the Earth's revolution and inclination movement on our weather patterns, secondary wind circulation patterns on the Earth, and characteristics of high-pressure areas, mountain winds, and valley-wind systems. We will describe the type of monsoons in Southeast Asia and discuss the Beaufort Scale and how it is used.</p>	1-5
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	6
Key terms - Definitions	Reinforce the correct definition for each key term.	7-12
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "List 2-3 reasons why basic knowledge about the wind would be helpful in every-day life." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on an introduction to wind and weather.	13
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	14

Chapter 9 / Section 1: NS2-M3C9S1 – Wind and Weather

Introduction	Explain that air in motion is called wind. Winds blow because they are attempting to achieve a balance in atmospheric pressure. The unequal distribution of atmospheric pressure is caused by the unequal heating of Earth's surface. Winds blow from high-pressure areas to low-pressure areas. The strength of these winds depends on the distance of the high from the low and the difference in pressure (the gradient) between the two areas. Since various places on Earth's surface receive more heat than others, temperatures and strengths of winds differ from one area to another.	15-16
Introduction	Explain that there is a continual flow of wind over the face of the Earth as the result of this uneven heating. From about 2½ to 3 miles above the surface to the tropopause, winds are westerly in direction at all degrees of latitude, from the equator to the poles. At the surface, a band of easterly winds called the trade winds extends from the equator to 30 degrees, both north and south. Between 30 degrees and 60 degrees, in both the Northern and Southern Hemispheres, there are the prevailing westerlies. Finally, between 60 degrees and both poles there are winds called the polar easterlies. Explain why there are so many different wind directions, and why there are differences in wind circulations in the Northern and Southern Hemispheres. The answers to these questions come from our knowledge of the motions of Earth itself.	17
Wind and the Earth's Rotation	Explain that two motions of Earth affect the weather. The movement of Earth around the Sun accounts for the seasonal changes on Earth. We will talk briefly about this a bit later. The other motion is the rotation of Earth on its axis. This rotation causes night and day, with the consequent heating and cooling effects on the atmosphere. It also produces the major wind belts of Earth.	18-19
Wind and the Earth's Rotation	Explain that if Earth did not rotate, the warmer air over the equator would rise and move north and south toward the poles, high above Earth's surface. The air would cool and sink as it moved toward the poles. Later, it would move back toward the equator at a steady speed and direction. However, the Coriolis effect discussed in unit 2 causes the direction of the wind to curve to the right in the Northern Hemisphere and to the left in the Southern Hemisphere. This curving or deflection effect continues until a balance with other forces is reached. Explain that at this point, we must again bring in the factor of atmospheric pressures in order to explain why there are different belts of prevailing primary winds on Earth.	20-21
Wind and the Earth's Rotation	Explain that we know that air rises at the equator and begins moving northward at high altitudes. It eventually sinks and accumulates near the surface, forming a high-pressure area. This sinking and accumulating takes place in the area of 30 degrees north and south latitudes. These areas are called the Horse Latitudes.	22
Wind and the Earth's Rotation	Explain that air must always flow outward from the center of a high-pressure area; this is called divergence. Conversely, air flows in toward the center of a low-pressure area; this effect is convergence. It follows that when both high and low pressure areas are present, air flows from the high to the low pressure area, thus creating wind.	23
Prevailing Winds	Explain that the equatorial belt of light and variable converging winds is called the doldrums. They vary in position and tend to move north and south of the geographic equator with the Sun. In the doldrums the temperatures are high and excessive precipitation occurs. Days go by without a breath of wind; thus, in the days of sail, ships avoided this area, if possible. Severe tropical storms begin here.	24
Prevailing Winds	Explain that at the surface and on the pole-ward sides of the doldrums there are bands of easterly winds called the trade winds. The northeast trades were a popular route for sailing vessels, and aircraft traveling west in the Northern Hemisphere are favored with a tail wind and clear skies if they fly near 30 degrees north latitude. The winds come from the southeast in the Southern Hemisphere, and thus are called the southeast trades.	25

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Prevailing Winds	Explain that these are the Horse Latitudes. Because of sinking wind from aloft and diverging winds at the surface, these areas generally have fair weather. The diverging winds cause the trade winds found on the equatorial side of this high-pressure belt. The Horse Latitudes tend to be cloudless and calm, with weak, undependable winds. The term “Horse Latitudes” comes from the fact that, in the days of sail, ships carrying horses from Europe often were becalmed here. When this happened, the horses died for lack of food and water, so the dead animals were thrown overboard to prevent the spread of disease.	26
Prevailing Winds	Explain that these winds are found on the pole-ward side of the subtropical highs and are created by the diverging winds of these highs. They blow from the southwest in the Northern Hemisphere and from the northwest in the Southern Hemisphere. The prevailing westerlies provide most of the air flow over the United States.	27
Prevailing Winds	Explain that the belt of low pressure known as the polar front zone lies in the area of 60 degrees north and south latitudes. In the north it is called the Arctic Semi-permanent Low, and in the south it is called the Antarctic Permanent Low. These two areas are noted for their bad weather because the westerlies and the polar easterlies converge in them.	28
Prevailing Winds	Explain that this is a zone of poorly developed surface winds created by outflow from the high pressure at the poles. They have a northeasterly direction in the Northern Hemisphere and a southeasterly direction in the Southern Hemisphere.	29
Check on Learning Questions A (Lesson questions 3-4)	Check in on student’s understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	30
Wind and the Earth’s Revolution	Explain that we have discussed in some detail the effects of the rotational movement of Earth on weather, and particularly its effect on winds. Another important movement is the revolution of our planet around the Sun. This movement, combined with Earth’s inclination, causes the seasons. Explain that Earth is inclined at an angle of $23\frac{1}{2}$ (23.5) degrees from the perpendicular to the plane of its orbit of revolution, called the plane of the ecliptic. This simply means that Earth tips at this angle all the time, like a top as it begins to slow down. Because of this fact, the part of Earth receiving the most direct rays from the Sun will vary over a year from 23.5 degrees north (tropic of Cancer) to 23.5 degrees south (tropic of Capricorn), as Earth proceeds in its orbit around the Sun.	31
Wind and the Earth’s Revolution	Explain that our seasonal weather variations are the result of the angle with which the Sun’s rays strike Earth as it revolves around the Sun, not the nearness of Earth to the Sun. In summer, because of Earth’s inclination, the Sun’s rays in the Northern Hemisphere are more direct, even though at this time Earth is farther away from the Sun. Thus, the rays are more concentrated and deliver more energy per unit area, making the weather warm. In winter in the Northern Hemisphere, Earth is actually closer to the Sun, but sunlight hits this hemisphere at a greater angle. Thus, the same amount of sunlight is spread over a larger area, delivering less energy per unit area, so it gets cooler. The reverse of this process happens in the Southern Hemisphere.	32
Secondary Wind Circulation	Explain that we know that nearly three-fourths of Earth’s surface is water. But not many people realize that three-fourths of the world’s land surfaces are in the Northern Hemisphere. In the summer these land surfaces heat very rapidly, while the water areas heat very slowly. In winter, the land cools rapidly and the water cools comparatively slowly, because the water retains part of the heat it gained during the previous summer. For this reason, water areas are cooler than land areas during the summer and warmer during the winter. The daily variation of temperature over open	33-35

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	<p>water is seldom more than 2 or 3 degrees, but 300 miles inland, it is rarely less than 15 degrees.</p> <p>Explain that the difference between the land and sea temperatures causes the pressure belts of the primary wind circulation to be broken up into enclosed high- and low-pressure areas, called centers of action. We see, therefore, that the geography of the continents and seas can also influence the wind and weather.</p>	
Highs	<p>Explain that in the Northern Hemisphere, air flows in a clockwise manner around high-pressure centers of action (also called anticyclones). Air subsides (sinks) in the center and diverges (blows outward) from the center of the high-pressure area. Few clouds are formed. Generally fair weather prevails, either warm or cold, depending upon the season.</p>	36
Highs	<p>Explain that major high-pressure areas exist near the poles. They produce very cold air, dependent on the seasons. A high-pressure area exists over Greenland all the time because of the vast ice cap there. Subtropical highs can usually be found southwest of California and near the Azores in the Atlantic. The high associated with the North Polar zone repeatedly creates icy polar fronts, which every winter sweep over most of North America east of the Rockies. This area is called the North American High. A similar high-pressure area exists in Siberia, where the temperate zone's coldest temperatures have been recorded. The North American and Siberian Highs are continental highs.</p>	37-39
Lows	<p>Explain that the only "permanent" low-pressure area on Earth is the Doldrum Belt near the equator. The Aleutian Low off Alaska is a low-pressure cell associated with the Polar Front and influenced by the Japanese Current. It is intense during the winter but ill-defined in summer. Another low-pressure area lying near Iceland is called the Icelandic Low. The Gulf Stream influences this low.</p>	40-41
Lows	<p>Explain that traveling low-pressure cells are frequently found in the area of the Polar Front. These are formed by the interaction of the polar air to the north and the maritime tropical air to the south. These lows are called migratory lows. Migratory storms may also move into lower latitudes from the Polar Front. Such storms often occur in the south-central United States and on the U.S. East Coast near Cape Hatteras.</p>	42
Lows	<p>Explain that local lows often form directly below large thunderhead clouds. Heat lows form over deserts and other intensely hot areas; a low-pressure area lasts most of the summer over the Arizona and California deserts. Lows sometimes form on the leeward side of mountain ranges and cause rushing winds to "pour" down from the nearby mountains. These lows are common just east of the Rocky Mountains in Colorado.</p>	43
Check on Learning Questions B (Lesson questions 5-6)	<p>Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.</p>	44
Mountain Winds	<p>Explain that as warm air rises on one side of the mountains, it cools and loses its moisture as rain or snow. The dry, cooler air then rushes down the opposite side, heating the air and pushing it into the low. Famous mountain winds are the Chinooks of the Rockies, the Santa Anas of southern California, and the foehns of the Swiss and French Alps. These winds sometimes reach gale force and, in the western United States, often become dust storms.</p>	45
Mountain Winds	<p>Explain that probably the most famous valley wind system is the Mistral of southern France. This is a cold, dry wind that rushes down the Rhône Valley toward the low-pressure system that often develops over the Mediterranean Sea. Sometimes reaching whole gale and storm force over 60 mph, this wind is one the U.S. Sixth Fleet must be on the alert for when involved in western Mediterranean operations.</p>	46

Chapter 9 / Section 1: NS2-M3C9S1 – Wind and Weather

Monsoons	Explain that monsoons are seasonal winds characteristic of South and Southeast Asia, though they occur elsewhere with less intensity and regularity. The monsoon is a very persistent wind that blows on predictable seasonal paths and with definite seasonal characteristics.	47
Monsoons	Explain the rains begin to fall in southern India in mid-May and continue to build up in intensity as the continent warms. The wet air rushes into the southern slopes of the Himalaya Mountains and dumps astounding amounts of rain on the southern Asian countries. It is common for the southeast Burmese coast to have 200 inches of rainfall during the period between mid-May and late September. At the foothills of the Himalayas, 500 inches of rain in the same period have been recorded almost every year. The greatest rainfall ever recorded occurred at Cherrapunji, India, during the monsoon: 1,041.78 inches. Squalls and typhoons occur over the Bay of Bengal during this time.	48-49
Monsoons	Explain that as the cold season of the Northern Hemisphere approaches, the continental high over Siberia regenerates and begins to dominate the air circulation over South and Southeast Asia. The wind now reverses itself and blows from the northeast. The rains of the summer season cease. A warm, low-pressure area now exists over the Indian Ocean. The cooler, dry air from central Asia now blows southwestward across the continent over the Himalayas and into the southern countries. The northeast wind persists from late September until April, when the humidity begins to rise for the next summer monsoon.	50
Monsoons	Explain that during the winter monsoon there is little rain, and by the time January and February arrive, the soil is parched and cracked, leaves have curled and died, and dust lies thick over much of the countryside. Dust in Upper Burma around Mandalay is often 4 to 6 inches thick along roads and in villages.	51
Winds and the Beaufort Wind Scale	Explain that meteorologists must always be aware of wind velocity and wind direction. Wind speed is always given in knots, according to international agreement. The instrument used to measure wind speed is called an anemometer. Wind blows into metal cups, which are attached to arms. The whirling cups turn a spindle, the speed of which is calibrated into wind speed. A vane atop the anemometer aligns itself with the direction of the wind. A dial on the instrument readout indicates the apparent wind velocity and direction.	52-54
Winds and the Beaufort Wind Scale	Explain that in addition to wind-measuring equipment, the Beaufort Wind Scale with Correlative Sea Disturbance Scale can also be used to estimate wind speed. This scale is based on careful observation of sea conditions. Admiral Sir Francis Beaufort of the British Royal Navy developed the scale in 1805 to estimate wind speeds from their effect on sails. His table numbered the winds from 0 to 12, in order of increasing severity. It compared them to the Sea Disturbance Scale, which describes sea state and mean height of waves on a scale of 0 to 9. Descriptive terms identify the winds and their counterpart waves. The Beaufort Wind Scale enables the shipboard weatherman or sailor to estimate wind speeds merely by looking at the sea state and then comparing the two scales.	55-58
Winds and the Beaufort Wind Scale	Explain that by convention, wind direction is specified according to the compass direction or geographic point of origin from which the wind blows.	59
Review Question	The Review Question is “List the major preparations a homeowner should make when a hurricane is forecasted to strike.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	60

Chapter 9 / Section 1: NS2-M3C9S1 – Wind and Weather

Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	61
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	62

III. Supplemental Activities -

A. In Class Activity:

Supplies required: handouts Warning Display Signals

When: At the end of the class

- Have the Cadets complete the Winds Handout. Use the random pick a student in CPS and have the students share their answers and discuss as a class

B. Take Home Activity: Have the cadets draw pictures of the Coastal Warning Display Signals both Day and Night. Describe what each Signal forecasted. Answer the question: Does the National Weather Service still use this system?

IV. Evaluation - see CPS database for chapter test questions.

Chapter 9 / Section 1: NS2-M3C9S1 – Wind and Weather

Activity1: In Class Activity – Winds Handout

Name: _____ Date: _____ Class: _____

Answer the questions with complete sentences and correct punctuation. Be prepared to share your answers with the class.

What causes Wind?

What are the “Trade Winds”?

How and where do they occur?

Why are they called the “Trade Winds”?

Chapter 9 / Section 1: NS2-M3C9S1 – Wind and Weather

Activity 1: Take Home Activity – Warning Display Signals

Name: _____ Date: _____ Class: _____

Draw pictures of the Coastal Warning Display Signals both Day and Night. Describe what each Signal forecasted. Does the National Weather Service still use this system?

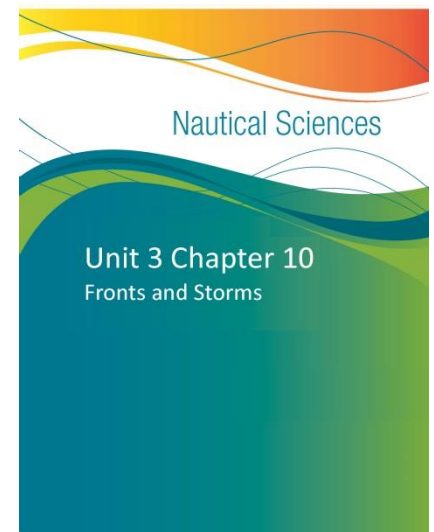
Module 3 Chapter 10: NS2-M3C10 – Fronts and Storms

What Students Will Learn to Do:

Demonstrate a working knowledge of meteorology and how it affects us

Skills and Knowledge to be Gained:

1. Describe the development of weather fronts
2. Describe the primary frontal zones: Intertropical Convergence Zone, Arctic Frontal Zone and Polar Frontal Zone
3. Describe the characteristics of a cold front
4. Describe the characteristics of a warm front
5. Describe the characteristics of an occluded front
6. Describe the formations, characteristics and developmental stages of a thunderstorm
7. Describe the weather phenomena within the thunderstorm
8. Describe the characteristics and formation of the tornado
9. Describe the characteristics and categories associated with tropical cyclones
10. Describe the birth and characteristics of the hurricane
11. Describe the characteristics of hurricanes, typhoons and their tracks
12. Describe the signs of an approaching tropical cyclone
13. Describe the purpose and function of Storm Warning Signals
14. Describe the purpose and function of the Hurricane Warning System



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...

Writing

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.2. Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...

Module 3 Chapter 10: NS2-M3C10 – Fronts and Storms

- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. Geography

- D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them.
- D2.Geo.9.9-12. Evaluate the influence of long-term climate variability on human migration and settlement patterns, resource use, and land uses at local-to-global scales.

Dimension 2. History

- D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place...

Next Generation Science Standards (NGSS)

HS.Space Systems

- HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.

HS.Human Sustainability

- HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 10 / Section 1: NS2-M3C10S1 – Frontal Weather

(Section 1 of 2)

What Students Will Learn to Do:

Demonstrate a working knowledge of meteorology and how it affects us

Skills and Knowledge to be Gained:

1. Describe the development of weather fronts
2. Describe the primary frontal zones: Intertropical Convergence Zone, Arctic Frontal Zone and Polar Frontal Zone
3. Describe the characteristics of a cold front
4. Describe the characteristics of a warm front
5. Describe the characteristics of an occluded front
6. Describe the formations, characteristics and developmental stages of a thunderstorm
7. Describe the weather phenomena within the thunderstorm

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	Development of Fronts (A)	Check On Learning A
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Development of Fronts (B)	Video Development of Fronts	Development of Fronts (C)	Check on Learning B	Thunderstorms	Weather Phenomena Associated with Thunderstorms	Review Questions	Closing Questions
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Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 10 / Section 1: NS2-M3C10S1 – Frontal Weather

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 10. Place a checkmark beside the NS2-M3C10S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C10S1 - Key Terms and NS2-M3C10S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons. We will address the following topics in this lesson: development of fronts, frontal zones, cold fronts, warm fronts, occluded fronts, thunderstorms, and weather phenomena within the thunderstorm. We will discuss tornadoes, tropical cyclones, life of hurricanes, typhoons and their tracks, signs of an approaching tropical cyclone and storm warning signals, and the hurricane warning system. When we have completed this lesson, you will have gained a better understanding of severe weather patterns and you will be better prepared to maneuver around turbulent weather.	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-7
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “List the characteristics of a thunderstorm.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on fronts and storms.	8
Warm-Up Questions(Lesson questions 1-2)	Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions. Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.	9
Introduction	Explain that mariners have much to fear when they are threatened by a severe storm. A North Atlantic gale can strain rigging, spring seams, bend plates, smash equipment, and tear loose topside equipment, even on aircraft carriers or bulk petroleum tankers.	10

Chapter 10 / Section 1: NS2-M3C10S1 – Frontal Weather

	Winds of 100 knots and waves of sixty feet or more are respected by an experienced seaman. The prudent Mariner will maneuver to stay clear of storms whenever possible.	
Introduction	Explain that an experienced Mariner should be able to see when weather disturbances are coming. One should observe the sky and sea and carefully assess readings of the meteorological instruments aboard. Also, today's radio communications provide regular weather summaries. The Mariner at sea will carefully plot such weather information and compare it with the vessel's position and where her destination.	11-13
Development of Fronts	Explain that fronts develop when air masses of different temperatures collide. Air masses rarely fuse unless they are very similar in temperature and moisture content. Fronts are weather systems that are sometimes called waves, as in the term "cold wave."	14
Development of Fronts	Explain that along the meeting edge or boundary of two dissimilar air masses, a battle for supremacy is fought. Usually, the colder, therefore heavier of the two masses, dominates and forces the warmer air upward. A cold front displaces the warm air ahead of it upward, while a warm front moves upward over a retreating cold-air mass.	15-16
Development of Fronts	Explain that a cold front or warm front may extend for hundreds of miles. However, the area in which frontal weather disturbances occur is usually a band 15–50 miles wide for a cold front and up to 300 miles wide for a warm front. The point where the cold and warm fronts converge is frequently the center of a low-pressure area.	17-19
Development of Fronts	Explain that the world's primary frontal zones are the Intertropical Convergence Zone, Arctic Frontal Zone, and Polar Frontal Zone. The convergence of the northeast trade winds of the Northern Hemisphere and the southeast trade winds of the Southern Hemisphere causes a band of unstable weather encircling Earth in the doldrums. This is called the Intertropical Convergence Zone (ITCZ). It varies in position, largely due to the seasons. This is a storm development area, but the storms themselves usually move pole-ward before they become severe. Brief, violent windstorms called <i>squalls</i> occur when the warm air rises and results in sudden, intense rainfall of short duration. Usually, there is good visibility between these squalls. In tropical seas it is often possible to see multiple separate rain squalls in progress, and several rainbows, all around the horizon.	20-21
Development of Fronts	Explain that the Arctic Frontal Zone develops between the arctic air of the far North and the polar maritime air of the North Atlantic and Pacific Oceans. This frontal zone may disappear as it moves northward during the summer, when it meets similar cold air.	22
Development of Fronts	Explain that the Polar Frontal Zone is formed by the convergence of the air that flows toward the equator from the Polar Easterlies and the Prevailing Westerlies—in other words, the temperate zones. This polar front is significant, since it greatly influences the weather in the temperate zones. The polar fronts move toward the poles during the summer and toward the tropics in the winter. This is the reason people in the temperate zones often experience a series of cold waves or snaps. The colder polar easterlies often break through the warmer band of westerlies.	23
Development of Fronts	Explain that when a cold front advances, the first change notable change is a darkening of the horizon to the west and to the north. Very soon thereafter, the cloud ceiling lowers, and rain begins. A fast-moving cold front, which may move as much as 700 miles in a day, with cumulonimbus clouds preceding it, brings sudden, violent showers or thunderstorms. If there are no cumulonimbus clouds ahead of the front, rainfall will most likely be steady.	24-25

Chapter 10 / Section 1: NS2-M3C10S1 – Frontal Weather

Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	26
Development of Fronts	Explain that passage of a cold front is usually marked by a wind shift, a drop in temperature, a rise in pressure, a rapid clearing of the sky, and good visibility. Squall lines often precede the cold front. Squall lines are often violent, causing flash floods from downpours, cloudbursts, and extremely turbulent winds.	27-28
Development of Fronts	Explain that a warm front will be preceded by cirrus clouds followed by, in order, cirrostratus, altostratus, nimbostratus, and finally stratus clouds. Visibility is poor in advance of a warm front. Frequently fog forms, and steady rain or drizzle prevails. Thunderstorms may develop ahead of this front.	29-30
Video on Development of Fronts	Show Video on Development of Fronts	31
Development of Fronts	Explain that when the frontal line is passing, a definite shift occurs in the wind direction, and the temperature rises sharply. Gradual clearing will take place, and pressure remains steady or slowly falls. A warm front moves much more slowly than a cold front at usually less than 15 m.p.h. Cloud sequences will begin as much as forty-eight hours in advance, often with rain. Cloud sequences may occur 1,000 miles in advance of the front.	32-33
Development of Fronts	Explain that this is an unstable frontal cyclone with a rapidly moving cold front. It will overtake warmer air masses. The cold front in this cyclone will always move so rapidly that it will force the entire overtaken warm front aloft. This type of occlusion is called the cold-front type.	34
Development of Fronts	A warm front that is raised aloft is called the upper front. Most occlusions of this type occur on the eastern portions of continents. Heavy frontal precipitation with thunderstorms occurs, though of less intensity than that of a regular cold front.	35-36
Development of Fronts	Explain that a warm-front type of occlusion occurs when the air ahead of the warm front is colder than the air behind the cold front. When this occurs, the cold front rides up over the warm frontal surface. The warm front, in this case, remains on the surface and is called the occluded front, while the cold front lifted aloft is called the upper front. This type of occlusion occurs chiefly in the Pacific Northwest. Severe icing and precipitation may occur in the area immediately behind the point where the cold front begins to rise.	37-38
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	39
Thunderstorms	Explain that the thunderstorm occurs within clouds with vertical development, such as cumulus and cumulonimbus. These storms are characterized by loud thunder, flashes of lightning, very heavy precipitation, strong gusts of wind, and occasional hail or tornadoes. Because the thunderstorm is local in nature and relatively short in duration, it is difficult to forecast.	40
Thunderstorms	Explain that a thunderstorm develops in three rapid stages. The first stage is an updraft of warm, moist air into the atmosphere. The water vapor cools and condenses into clouds, and the clouds grow taller and taller as the updrafts continue. This first stage of development is called the cumulus stage.	41

Chapter 10 / Section 1: NS2-M3C10S1 – Frontal Weather

Thunderstorms	Explain that the second stage, called the mature stage of thunderstorm development, is characterized by both updrafts and downdrafts within the storm-producing cloud. The cooler the upper part becomes as it towers into the atmosphere, the faster raindrops and even hail will begin to form and fall. Downdrafts are caused by the raindrops falling. There is frictional drag between the raindrops and the surrounding air, so that the air is pulled down with the raindrops. The mature cell usually extends above 25,000 feet. The downdrafts do not extend as high due to the fact that there is insufficient moisture at the higher altitudes.	42
Thunderstorms	Explain that the final stage is called the <i>dissipating</i> or <i>anvil</i> stage. As more and more air is pulled down by raindrop friction and become downdrafts, the downdrafts take the place of updrafts and expand, spreading outward. The entire lower portion of the cloud becomes a downdraft, and the high winds in the upper altitudes flatten the top of the cloud into an anvil shape. Rain is now falling heavily on the ground, but the storm will dissipate in a short time.	43
Weather Phenomena Associated with Thunderstorms	Explain that rain is found in every thunderstorm. Some rain will form in regions below freezing level. Hail will form if the updrafts carry melted or partially melted raindrops into the higher, colder altitudes. Snow and ice crystals also may be in any thunderstorm, winter or summer, though in summer they will melt into rain when nearing the Earth.	44
Weather Phenomena Associated with Thunderstorms	Explain that a thunderstorm is most turbulent in the area of heaviest precipitation. Icing will often occur just above the freezing level, making this a very hazardous area for aircraft.	45
Weather Phenomena Associated with Thunderstorms	Explain that the leading gust of wind, sometimes called a microburst, is one of a thunderstorm's dangers. This gust occurs just prior to the passage of the storm. The strong winds at the surface are the result of the horizontal spreading-out of the storm's downdraft currents as they approach the surface of the Earth. The speed of the first gust usually is the highest recorded during any thunderstorm and can blow in any direction—even in opposition to the surface wind that is "pushing" the storm. Such conditions can result in "wind shear," which is very dangerous to aircraft during take-off or landing.	46-47
Weather Phenomena Associated with Thunderstorms	Explain that surging air currents in the thunderhead cloud create static electricity with is the source of lightning. This process is not completely understood, but it is generally believed that lightning is caused by the breaking-up of large water droplets into positively and negatively charged particles. Positive charges develop near the top of the cloud and negative particles accumulate in the lower reaches. An electrical discharge occurs when these charges reach sufficient strength to overcome the electrical resistance between them. The resulting lightening is nature's way of neutralizing the charges between the two electrical regions.	48-49
Weather Phenomena Associated with Thunderstorms	Explain that the buildup of electricity in a thunderhead may reach millions of volts. The lightning may flash within the cloud, jump to other clouds, jump from the clouds to the ground, or even jump from the ground up to the cloud.	50
Weather Phenomena Associated with Thunderstorms	Explain that lightning occurs in two steps. First, a leader of electrified (ionized) air runs between the two polar opposite charged regions. This establishes a "circuit" for the second stroke, which leaps along the leader to complete the circuit. The second stroke of lightening is the one you see and consequently, the stroke that causes the thunder you hear. The lightning generates incredible heat, causing an explosive expansion of glowing hot air and producing the audible thunder.	51-52

Chapter 10 / Section 1: NS2-M3C10S1 – Frontal Weather

Weather Phenomena Associated with Thunderstorms	Explain that lightning follows the shortest route between a cloud and the ground. Thus, high points such as trees, telephone poles, TV antennas, ship and boat masts, and the like are the places most likely to be struck by lightning.	53
Weather Phenomena Associated with Thunderstorms	Explain that lightning also follows the easiest route to ground after striking, so it will follow electrical wires, plumbing pipes, sailboat rigging, and even drafts of air in its attempt to reach the ground. It is very unwise to be on or near bodies of water during a thunderstorm and one must never be out in an open boat. Mountainous areas, especially crevices or rushing mountain streams, also should be avoided during an electrical thunderstorm.	54-55
Weather Phenomena Associated with Thunderstorms	Explain that a fundamental rule for airplane pilots is never to fly under or through a thunderstorm. It is safest to fly around the storm. If a pilot must fly through a storm, it should be penetrated at an altitude about one-third its height.	56
Review Question	The Review Question is, "Describe ways in which lightening can be dangerous." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	57
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	58
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	59

III. Supplemental Activities -

A. In Class Activity:

Supplies required: handout for In Class and Take Home Activities

When: Can be used at the end of the lesson

- Have the cadets compare and contrast the weather associated with a Warm Front with the weather associated with a Cold Front.

B. Take Home Activity: Have the cadets develop a one page "Safety Checklist" on what to do in a thunderstorm. Include the following: How to recognize a thunderstorm cell. How to determine distance from a lightning strike. Where to seek shelter. Places you should avoid during a thunderstorm. Use graphics where appropriate.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 10 / Section 1: NS2-M3C10S1 – Frontal Weather

Activity 1: In-Class Activity – Weather Fronts

Name: _____ Date: _____ Class: _____

Directions: Compare and contrast the weather associated with a Warm Front with the weather associated with a Cold Front, be descriptive.

[illegible]

Chapter 10 / Section 1: NS2-M3C10S1 – Frontal Weather

Activity1: At Home Activity – Safety Checklist

Name: _____ Date: _____ Class: _____

Develop a single page “Safety Checklist” on what to do in a thunderstorm. Include the following: How to recognize a thunderstorm cell. How to determine distance from a lightning strike. Where to seek shelter. Places you should avoid during a thunderstorm. Use graphics where appropriate.

Chapter 10 / Section 2: NS2-M3C10S2 – Tornadoes

(Section 2 of 2)

What Students Will Learn to Do:

Demonstrate a working knowledge of meteorology and how it affects us

Skills and Knowledge to be Gained:

1. Describe the characteristics and formation of the tornado
2. Describe the characteristics and categories associated with tropical cyclones
3. Describe the birth and characteristics of the hurricane
4. Describe the characteristics of hurricanes, typhoons and the related tracks
5. Describe the signs of an approaching tropical cyclone
6. Describe the purpose and function of Storm Warning Signals
7. Describe the purpose and function of the Hurricane Warning System

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	KeyTerm Definitions	Opening Question	Warm Up Questions	Tornadoes	Check On Learning A	Tropical Cyclones
Characteristics of Hurricanes and Typhoons	Check on Learning B	Navigation in Tropical Cyclones	Storm Warning Signals	Hurricane Warning Systems	Review Questions	Closing Questions	Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 10 / Section 2: NS2-M3C10S2 – Tornadoes

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 10. Place a checkmark beside the NS2-M3C10S2 PowerPoint presentation, and these two CPS question deck files: NS2-M3C10S2 - Key Terms and NS2-M3C10S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>We will address the following in this lesson: development of fronts, frontal zones, cold fronts, warm fronts, occluded fronts, thunderstorms, and weather phenomena within the thunderstorm. We will discuss tornadoes, tropical cyclones, life of hurricanes, typhoons and their tracks, signs of an approaching tropical cyclone and storm warning signals, and the hurricane warning system. At the completion of this lesson, you will have a better understanding of severe weather patterns, which will allow you to maneuver around these problems.</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-12
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “List characteristics of a tornado.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question with a partner for 30-60 seconds before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, ‘Focusing on Tornadoes’.	13
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	14
Tornadoes	Explain that the most intense and violent of localized storms is the tornado. It is usually associated with violent thunderstorm activity and heavy rain. Tornadoes are wind whirlpools of such violence that any homes caught in their path will disintegrate like matchsticks, brick buildings will be destroyed, and trains will be derailed. Feathers	15

Chapter 10 / Section 2: NS2-M3C10S2 – Tornadoes

	and straws may be propelled by the swirling wind with the force of power-driven nails.	
Tornadoes	Explain that tornadoes are of very small diameter, usually 300-400 feet, but they may continue on an erratic path for more than 100 miles. Winds in the vortex—the whirlwind causing the funnel—often exceed 300 miles per hour. However, the speed of the storm moving over the Earth’s surface is comparatively slow, usually 25-40 miles per hour. The duration over any given spot may be only seconds—but in that short time the devastation caused can be catastrophic.	16-17
Tornadoes	Explain that tornadoes build up only during severe thunderstorms. Fortunately, only about one thunderstorm out of a thousand develops a tornado. A tornado forms as a funnel cloud on the forward edge of a fully developed cumulonimbus cloud. Rising air causes a swirling at the base of the parent cloud. As the swirl increases in size and speed, the funnel drops out of the cloud, like an elephant’s trunk dangling toward the surface. When it touches ground, the funnel is called a tornado. If the funnel forms over water, it is called a waterspout.	18-19
Tornadoes	Explain that a dust devil is a small whirlwind, common in dry regions on hot, calm afternoons and is made visible by dust, debris, and sand it picks up from the ground.	20
Tornadoes	Explain that tornadoes are most common in the temperate zone (the midlatitudes between 23.5 degrees and 66.5 degrees north and south), probably because of the greater atmospheric temperature contrasts found in these areas. The Midwestern United States is the most tornado-ravaged area of the world. Usually these storms hit in the late spring or early summer but can occur at almost any time.	21
Tornadoes	Explain that the extreme low pressure in the vortex of a tornado causes closed homes and barns to explode outward from the normal pressure of air trapped inside. There is a 100-200 mile per hour updraft in the center of the funnel. The updraft is powerful enough to sweep up all manner of dust and debris, houses, cars, animals, and even people.	22
Check on Learning Questions A (Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	23
Tropical Cyclones	Explain that a cyclone is any circular area of low atmospheric pressure. The winds around a cyclone travel counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere. The so-called tropical cyclones are subdivided into three categories: (1) tropical depression—maximum wind less than 34 knots, (2) tropical storm—maximum wind 34-63 knots, and (3) hurricane or typhoon—maximum wind 64 knots and up. Common usage has confused the term "cyclone" to mean a hurricane. Large tropical cyclones occur in many places throughout the world and are called by various names.	24-25
Characteristics of Hurricanes and Typhoons	Explain that tropical cyclones form over all tropical oceans except the South Atlantic, but they do not form over continents. They are common in the West Indies, often ranging up the East Coast of the United States or into the Gulf of Mexico, where they are called hurricanes. Tropical cyclones occurring east of the International Date Line in the Pacific have also become known as hurricanes. In the Western Pacific, off the coast of China, they are called typhoons. Off the west coast of Australia they are called willy-willies, and off the Philippines they are called baguios.	26
Characteristics of Hurricanes and Typhoons	Explain that hurricanes and typhoons are given women’s and men’s names, alternating through the alphabet in the order in which the storms appear each season. Before 1978, all these storms were named after women.	27

Chapter 10 / Section 2: NS2-M3C10S2 – Tornadoes

Characteristics of Hurricanes and Typhoons	Explain that although the velocities associated with these tropical hurricanes are less than those of a tornado, they cover hundreds of times the area and last much longer. The tropical cyclone is the most destructive of all weather phenomena, and is of greatest concern to the oceangoing sailor.	28
Characteristics of Hurricanes and Typhoons	Explain that the birth of a hurricane often occurs in that region near the equator where trade winds meet to form the Intertropical Convergence Zone (ITCZ). Tropical cyclones, however, never occur right on the equator because they require the twisting Coriolis forces of Earth's rotation to initiate the spinning. The Coriolis forces are not present on the equator.	29
Characteristics of Hurricanes and Typhoons	Explain that although their tracks cannot be predicted individually, it is common in the Northern Hemisphere that hurricanes move westward from their point of origin, then curve to the northeast. In the Southern Hemisphere they start out westward and then curve southeastward. Hurricanes vary in diameter from 60 to 1,000 miles. They have moderate winds at their outer edges, increasing toward the center, where velocities higher than 175 knots (200 mph) have been recorded. At the center is an area called the eye of the storm, which averages about 14 miles in diameter. This area is relatively calm, with light winds and clear or moderately clear skies and a little drizzle.	30-31
Characteristics of Hurricanes and Typhoons	Explain that an Atlantic hurricane starts as a tropical low, grows into a storm, and eventually matures into a hurricane when its winds reach 75 miles per hour. While it is moving along its track, it is growing in intensity. By the time it begins to curve to the northeast, it comes over cooler waters and into cooler air. Cooling reduces its internal action, until it finally dissipates into an extratropical low, usually ending as a gale or storm over the North Atlantic or North Sea.	32
Characteristics of Hurricanes and Typhoons	Explain that the elements of wind, temperature, pressure, humidity, and rain vary little in the different quadrants of a tropical cyclone. Winds increase from the outer limits to the edge of the eye. The temperature rises and the humidity falls at the center. Precipitation is in the form of showers at the outer limits. It becomes heavier toward the center, and is heaviest in the right front quadrant.	33
Characteristics of Hurricanes and Typhoons	Explain that hurricanes are usually associated with great wind-caused tides called storm surges that inundate the land areas they approach. These storm surges cause more damage than do the wind and rain of the storm itself. The doldrums, with their baffling winds and frequent rain squalls and thunderstorms, are the breeding place of most tropical cyclones.	34
Characteristics of Hurricanes and Typhoons	Explain that hurricanes occur most frequently in September and October, but they can happen anytime from June to December. A typical hurricane that originates in the doldrums east of the West Indies will follow a curving track northeastward from the Greater Antilles. It then hits the east coast of Florida and turns north, spreading destruction along the eastern seaboard of the United States, sometimes as far north as New York. Such an East Coast hurricane will usually cause heavy rains from Philadelphia northward into New York, Connecticut, Rhode Island, and Massachusetts. It will also cause tidal flooding from Georgia to Virginia, even if the main brunt of the storm never actually hits the coast.	35
Characteristics of Hurricanes and Typhoons	Explain that with somewhat less frequency, but often with greater violence, a hurricane originating in the same area will move south of Cuba and swing into the Gulf of Mexico, where, like a captured tempest in a teapot, it will wreak havoc throughout the Gulf Coast. A Gulf Coast hurricane often will dissipate in the Mississippi Valley with heavy rainfall extending as far north as the states of Tennessee, Kentucky, and Illinois.	36

Chapter 10 / Section 2: NS2-M3C10S2 – Tornadoes

Characteristics of Hurricanes and Typhoons	Explain that the southwestern part of the North Pacific has more tropical cyclones than any other place on Earth. These tropical cyclones generally are born between the Marshall Islands and the Philippines and move toward the east coast of China, then northeastward over the Philippines, Taiwan, Okinawa, and Japan. The typhoon may veer into the Asian continent anywhere along its east coast and it is usually accompanied by terrible storm surges.	37
Characteristics of Hurricanes and Typhoons	Explain that tropical cyclones sweep deep inland along the low-lying coastal plains and up the numerous rivers, causing widespread destruction and loss of life. And, just as a hurricane may move into the Gulf of Mexico, a typhoon may sweep south of the East Indies (Indonesia) into the Bay of Bengal and then hit the coast of southern Asia.	38
Characteristics of Hurricanes and Typhoons	Explain that in probably the greatest natural catastrophe in history, a typhoon swept over the Bay of Bengal in 1737. The storm pushed a forty-foot surge of water inland, killing 300,000 people. Other catastrophic incidences include a hurricane that struck Galveston, Texas, in 1900 killed 6,000 people and a terrible hurricane that struck New England in 1938, causing 600 deaths and property damage exceeding \$250 million. The entire boardwalk at Atlantic City, New Jersey, has been swept away on several occasions. The entire city of Belize, British Honduras, was destroyed in the late 1960's. The survivors rebuilt their city on a new site farther inland and on higher ground. The strongest hurricane to ever strike land in the Western Hemisphere was Hurricane Gilbert, which came west across the Atlantic and lower Gulf of Mexico in September 1988. It hit the Yucatán Peninsula with winds of 175 miles per hour and a record low pressure of 26.13 inches of mercury, killing 500 people and rendering 500,000 homeless as it swept across Latin America.	39-44
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	45
Navigation in Tropical Cyclones	Explain that cyclonic winds in the Northern Hemisphere circulate in a counterclockwise direction; those in the Southern Hemisphere circulate clockwise. Mariners must know this if it becomes necessary to maneuver out of a hurricane's path.	46
Navigation in Tropical Cyclones	Explain that if you face in the same direction the storm in the Northern Hemisphere is moving, winds in the right semicircle are circulating so as to draw a vessel in that area into the path of the storm center. This is called the 'dangerous semicircle'. The wind also will tend to carry the vessel along with the storm as it moves along its track. On the other hand, winds in the left semicircle, called the 'navigable semicircle', tend to drive the vessel out of the path of the storm and help her get behind the storm.	47
Navigation in Tropical Cyclones	Explain that maneuvering a vessel in a hurricane consists mainly of determining whether she is in, or approaching, the dangerous semicircle, and if she is, finding the best method of working out of that undesirable position.	48
Storm Warning Signals	Explain that flags and pennants hoisted at the National Weather Service and other shore stations indicate the presence or forecast presence of unfavorable winds. These signals are now flown over most major marinas on the Great Lakes, other major recreational lakes in the nation, ocean beaches, coastal harbor marinas, and Coast Guard stations	49
Storm Warning Signals	Small craft warning – Explain that one red pennant displayed by day, and a red light over a white light at night, indicate that winds of up to 38 miles per hour (33 knots) and sea conditions dangerous to small craft are forecast in the area.	50

Chapter 10 / Section 2: NS2-M3C10S2 – Tornadoes

Storm Warning Signals	Gale warning – Explain that two red pennants displayed by day, and a white light above a red light at night, indicate that winds ranging from 39 to 54 miles an hour (34–47 knots) are in the weather forecast.	51
Storm Warning Signals	Storm warning – Explain that a single square red flag with a black center displayed during daytime, and two red lights at night, indicate that winds of 55 miles per hour (48 knots) and above are in the weather forecast.	52
Storm Warning Signals	Hurricane warning – Explain that two square red flags with black centers displayed by day, and a white light between two red lights at night, indicate that winds 74 miles per hour (64 knots) and above are in the weather forecast for the area.	53
Hurricane Warning Systems	Explain that the U.S. Hurricane Warning System was set up in 1938 as a cooperative effort of the National Weather Service, the Navy, and the Army Air Corps. Until that point, hurricanes struck with almost no prior warning. Reconnaissance airplanes equipped with radar and weather instruments were sent to scout suspected storm areas.	54
Hurricane Warning Systems	Explain that in more recent years, weather satellites supplemented by reconnaissance aircraft are used to supply data on these storms. Bulletins are issued every few hours, giving the latest information on the storm, the intensity of the storm, and its current location and probable path, thus furnishing timely warning to all who may be in danger. Ships and aircraft can change course to avoid the storm, people have time to secure their property to reduce damage, and to evacuate from areas expected to bear the brunt of the storm.	55-56
Review Question	The Review Question is, “Describe storm warning signals for unfavorable winds in the vicinity of harbors and beaches.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement and to foster discussion.	57
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	58
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	59

Chapter 10 / Section 2: NS2-M3C10S2 – Tornadoes

III. Supplemental Activities -

A. In Class Activity:

Supplies required: handouts for In Class and Take Home Activities

When: Should be used at the end of this lesson

- Have the cadets use the provided map of the continental United States and highlight the geographic areas of the United States that are most susceptible to tornadoes, particularly “tornado alley”. At the bottom of the Map have them answer the question: What weather conditions make these areas favorable for tornadoes?

B. Take Home Activity: Have the cadets use the handout ‘Tornado Warnings’ to list the warnings that are broadcast in areas where tornadoes occur. Describe what each warning means. Describe precautions that people living in tornado zones take in order to protect themselves.

Also, have the cadets explain the recommended action that should be taken if the alert is for the cadet’s individual neighborhood and the cadet is home. What action should be taken if you are driving on the freeway and see a tornado heading for you? What action should be taken if you are at a mall and the tornado warning is given?

IV. Evaluation - see CPS database for chapter test questions.

Chapter 10 / Section 2: NS2-M3C10S2 – Tornadoes

Activity 1: In-Class Activity – Tornado Map

Name: _____ Date: _____ Class: _____

Directions: Mark the geographic areas of the United States that are most prone to tornadoes, particularly “tornado alley”.

Answer the question: What weather conditions make these areas prone to tornadoes?



Chapter 10 / Section 2: NS2-M3C10S2 – Tornadoes

Activity 1: Take Home Activity – Tornado Warnings

Name: _____ Date: _____ Class: _____

Directions:

List the warnings that are broadcast in areas where tornadoes occur. Describe the meaning of each. Describe precautions that people living in tornado zones take to protect themselves.

Explain what the recommended action one should take if: 1) the alert is for your neighborhood and you are at home. 2) If you are driving on the freeway and see a tornado heading for you. 3) If you are at a mall.

[illegible]

Module 3 Chapter 11: NS2-M3C11 – Weather Forecasting

What Students Will Learn to Do:

Demonstrate a working knowledge of meteorology and how it affects us

Skills and Knowledge to be Gained:

1. Describe the function and structure of the National Weather Service
2. Describe the function of the Navy Weather Service
3. Describe the forecasting services the National Weather Service provides
4. Describe the purpose of weather satellites
5. Describe the service weather maps and charts provide to navigators

Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...
- RI.9-10.4. Determine the meaning of words and phrases as they are used in a text...
- RI.9-10.9. Analyze seminal U.S. documents of historical and literary significance...

Writing

- W.9-10.3. Write narratives to develop real or imagined experiences or events...
- W.9-10.6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products...
- W.9-10.8. Gather relevant information from multiple authoritative print and digital sources...

Speaking & Listening

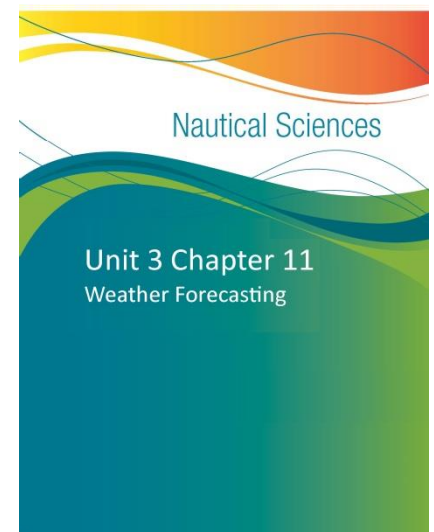
- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

Next Generation Science Standards (NGSS)

HS.Weather and Climate



Module 3 Chapter 11: NS2-M3C11 – Weather Forecasting

- HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor’s Guide.

Chapter 11 / Section 1: NS2-M3C11S1 – Weather Forecasting

(Section 1 of 1)

What Students Will Learn to Do:

Demonstrate a working knowledge of meteorology and how it affects us

Skills and Knowledge to be Gained:

1. Describe the function and structure of the National Weather Service
2. Describe the function of the Navy Weather Service
3. Describe the forecasting services the National Weather Service provides
4. Describe the purpose of weather satellites
5. Describe the service weather maps and charts provide to navigators

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	National Weather	Check On Learning A
The Naval Meteorology/ Oceanography Command	Forecast Services and Weather Maps (A)	Check on Learning B	Forecast Services and Weather Maps (B)	Weather Satellites	Review Questions	Closing Questions	Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, chapter 11. Place a checkmark beside the NS2-M3C11S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C11S1 - Key Terms and NS2-M3C11S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 11 / Section 1: NS2-M3C11S1 – Weather Forecasting

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>Weather forecasting has developed into a full-time activity of the U.S. government, the armed services, and many commercial meteorological enterprises. In this lesson we will discuss structure and techniques used by the National Weather Service and the Navy Oceanographic Command Centers to forecast the weather. We will talk about the purpose of weather satellites, and the service weather maps and charts provide to navigators.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-11
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is “List 2-3 sources you would go to get timely and accurate weather forecasts.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on weather forecasting.	12
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	13
Introduction	Explain that weather forecasting has developed into a full-time activity of the U.S. government, the armed services, and many commercial meteorological enterprises. This chapter will discuss some of the procedures used by the National Weather Service and the Naval Meteorological and Oceanography Command to forecast the weather.	14
National Weather	Explain that the principal weather agency in the United States is the National Weather Service. It is part of the National Oceanic and Atmospheric Administration (NOAA), which is a part of the Department of Commerce. The National Weather Service reports the weather of the United States and its territories and provides weather, hydrologic (water effects), and climate forecasts and warnings to the general public. It issues warnings about such destructive weather conditions as hurricanes, tornadoes, and floods. It provides special weather services in support of aviation, marine activities, agriculture, forestry, urban air-quality control, and other activities that are sensitive to the weather.	15-16
National Weather	Explain that the National Weather Service is composed of a headquarters at Camp Springs, Maryland, near Washington, D.C.; six national support centers; and six	17-19

Chapter 11 / Section 1: NS2-M3C11S1 – Weather Forecasting

	regional headquarters that support field activities throughout the continental United States, Puerto Rico, Alaska, Hawaii, and other islands in the Pacific Ocean. It receives weather data from about 12,000 substations, many of which are maintained by volunteers.	
National Weather	Explain that chief among the six national support centers is the National Centers for Environmental Prediction, actually a group of nine different specialized centers that each focus on one aspect of the overall national warning and forecasting process. They include the Aviation Weather Center at Kansas City, Missouri; the Climate Prediction Center at Camp Springs, Maryland; the Space Environment Center at Boulder, Colorado; the Storm Prediction Center at Norman, Oklahoma; the Tropical Prediction Center (better known as the National Hurricane Center) at Miami, Florida; and four other centers.	20-21
National Weather	Explain that the National Weather Service employs thousands of people twenty-four hours a day, seven days a week. It operates some 400 weather facilities throughout the fifty states, and it also has facilities in overseas locations and on ships worldwide. Each day it receives and processes 12,000 synoptic (general) and 25,000 hourly reports from surface observation stations; 1,400 reports from ships; 1,500 atmospheric soundings; 2,500 reports from aircraft; and all available cloud, temperature, and other data from weather satellites.	22
National Weather	Explain that the service provides weather information to newspapers, radio and television stations, and other media for the general public. It makes studies of climate and conducts basic and applied research for the purposes of improving future forecasts and services and advancing the science of meteorology.	23-24
National Weather	Explain that much of the National Weather Service's everyday activity is geared to the service of aviation through its Aviation Weather Center in Kansas City, Missouri. It makes available up-to-the-minute flight condition forecasts to all parts of the aviation community.	25
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	26
The Naval Meteorology and Oceanography Command	Explain that because the National Weather Service must serve so many interests in so many ways, it cannot gear its activities to the special needs of the armed services worldwide. Each of the services must maintain its own weather agency. For the Navy, this is the mission of the Naval Meteorology and Oceanography Command headquartered at Stennis Space Center, Mississippi. It provides global forecast services to meet Navy and other Department of Defense needs throughout the world. It includes elements of the operating forces, shore establishment, and Navy Department, and cooperates fully with all national, regional, and international weather agencies. It is also an active participant in the World Meteorological Organization (WMO).	27-28
The Naval Meteorology and Oceanography Command	Explain that navy weather units are maintained with all major aviation units, major combatant and auxiliary vessels, fleet flagships, and most naval shore activities. Trained enlisted aerographer's mates and meteorological officers are assigned to these weather units. On ships that do not carry aerographers and meteorologists, weather observations and reporting are carried out by the ship's navigator, assisted by trained quartermasters.	29-30

Chapter 11 / Section 1: NS2-M3C11S1 – Weather Forecasting

The Naval Meteorology and Oceanography Command	Explain that there are six U.S. Naval Meteorological and Oceanographic Centers (NMOCs) located around the world where they can serve the operating forces within their regions. The NMOCs are located at Norfolk, Virginia; San Diego, California; Rota, Spain; Pearl Harbor, Hawaii; Yokosuka, Japan; and Bahrain in the Persian Gulf. The NMOCs use the basic information acquired from various sources, compile it into weather broadcasts and warnings, and transmit this information to the operating forces within their areas of responsibility.	31-32
Forecast Services and Weather Maps	Explain that the National Weather Service publishes many kinds of weather forecasts. Among these are twenty-four-hour detailed forecasts, five-day forecasts, thirty-day general outlooks, twelve-hour aviation forecasts, and special bulletins, weather maps, and storm and frost warnings.	33
Forecast Services and Weather Maps	Explain that newspaper, TV, and radio weather reports rely on many of these services. For air safety, complete weather reports are given to pilots by the Federal Aviation Agency, in cooperation with the National Weather Service. Pilots also get frequent updates of weather information while flying. It is common for commercial airline passengers to hear their captain, just a few minutes after the plane takes off, reporting the weather conditions expected at the destination of the flight.	34
Forecast Services and Weather Maps	Explain that the two kinds of weather reporting are local and long-range forecasting. The long-range study is more concerned with an overall view of the climate, and with predictions for a year or more in the future. Publications called almanacs provide long-range weather predictions for the year ahead; these are based on average weather reported for years past. Explain that local weather is predicted up to a month or so in advance. The accuracy of these predictions is dependent upon timely readings taken at many reporting stations—on land and by weather ships, balloons, and weather satellites. While forecasting is becoming much more accurate, it still is not an exact science, due to the wide variety of local atmospheric uncertainties.	35-36
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	37
Forecast Services and Weather Maps	Explain that in the Navy elements of the Naval Meteorological and Oceanography Command prepare several types of forecasts, each for a specific purpose and containing specific information. Area forecasts are prepared by major units afloat and ashore. The area covered is the "operating area" of the major units. Area forecasts will include a synopsis of weather conditions in the forecast area. They will report all pressure systems and their associated weather, including the system's position, intensity, and direction of movement. Intensity will include wind direction and velocity, visibility, and weather types. Position will always be reported by latitude and longitude.	38
Forecast Services and Weather Maps	Explain that local forecasts are prepared by ships or stations and are used in planning local operations. These reports will include a brief summary of the synoptic pressure situation, fronts, severe weather, fog, and so on. They normally cover a thirty-six-hour prediction period. Specific details affecting operations (such as flying conditions, temperatures, precipitation, sea conditions, icing, ceilings, visibilities, and turbulence) are all included in the local forecasts.	39
Forecast Services and Weather Maps	Explain that there is a weather routing service provided by Fleet Weather Center - Norfolk called 'Optimum Track Ships Routing' (OTSR) that gives recommended paths and updates to avoid heavy weather and complete open ocean crossings in the most time-efficient manner.	40

Chapter 11 / Section 1: NS2-M3C11S1 – Weather Forecasting

Forecast Services and Weather Maps	Explain that route, flight, and terminal forecasts are prepared for a flight operation and are issued by the station or ship involved in the operation. The route forecast refers to weather conditions along a specific route. The flight forecast pertains to the weather conditions on successive stages of a flight. The terminal forecast provides landing and takeoff conditions at fields on the way.	41-43
Forecast Services and Weather Maps	Explain that storm warnings are included in scheduled broadcasts to both the fleet and the merchant marine. Warnings are issued by the NMOC responsible for the area in which the storm is located. Storms reported are thunderstorms, tornadoes, local wind storms, and major cyclonic storms. Special warnings are issued for tropical cyclones.	44-45
Forecast Services and Weather Maps	Explain that weather maps are printed and distributed each week by the National Weather Service. Each packet contains the weather maps for each day of the week in pamphlet form. All symbols used on the maps are explained in map legends, so even the novice can obtain considerable information from them. Isobaric forecasting is possible by careful reading of the weather maps, since all frontal zones are carefully charted, along with wind direction.	46-48
Weather Satellites	Explain that weather satellites are the newest forecasting tool available to the meteorologist. Early weather satellites began with the TIROS (TV and Infrared Observation Satellite) in 1960. Since then, improved systems have been developed and placed in orbit.	49
Weather Satellites	Explain that the newest satellites are equipped with cameras that transmit pictures of the cloud formations on the Earth's surface, either by day or by night. Other sensors relate surface temperatures and fronts, storms, snow, sea ice, and cloud heights. Orbiting at a height of about 900 miles, these satellites circle Earth every 115 minutes and view the entire planet three times a day.	50-51
Weather Satellites	Explain that geosynchronous satellites, hovering 22,300 miles at a fixed location above the equator, photograph an entire hemisphere every half an hour. Spectacular pictures of whole hurricane systems and frontal weather patterns are now a regular part of weather forecasting.	52-53
Review Question	The Review Question is "What would be some of the career paths that someone who was a Navy aerographer might take later?" Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	54
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	55
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	56

Chapter 11 / Section 1: NS2-M3C11S1 – Weather Forecasting

III. Supplemental Activities -

A. In class Activity:

Supplies required: Handouts for In Class and Take Home Activities

When: After the end of the lesson

- Using the Handout “PIREP”, have the cadets answer the questions using complete sentences and punctuation:
 - What is PIREP?
 - What information is contained in a PIREP?
 - Why is the information useful?

B. Take Home Activity: Have the cadets think about the following questions: When flight crews are preparing for a flight, what weather reports or products are included in their planning process? What do these reports tell them? Using the handout “Trip Planning”, Tell the cadets they are to prepare for a fictional flight to a favorite destination and list the weather reports for today they would include in their plan and why.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 11 / Section 1: NS2-M3C11S1 – Weather Forecasting

Activity 1: In Class Activity – PIREP

Name: _____ Date: _____ Class: _____

Answer the questions using complete sentences and punctuation:

What is PIREP?

What information is contained in a PIREP?

Why is the information useful?

Chapter 11 / Section 1: NS2-M3C11S1 – Weather Forecasting

Activity 1: Take Home Activity – Trip Planning

Name: _____ Date: _____ Class: _____

Directions: Think about these questions: When flight crews are preparing for a flight, what weather reports or products are included in their planning process? What do these reports tell them?

You are to prepare for a fictional flight to a favorite destination and list the weather reports for today you would include in their plan and explain why.

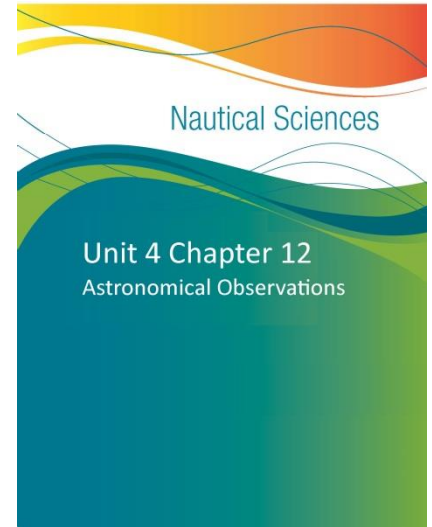
Module 3 Chapter 12: NS2-M3C12 – Introduction to Astronomical Observations

What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars and planets

Skills and Knowledge to be Gained:

1. Explain the theories of the creation of the universe
2. List the methods for astronomical observation
3. Describe the methods for using the telescope
4. Identify the types of telescopes
5. Describe examples of satellites and other exploratory spacecraft
6. Explain the efforts in exploring the Solar System
7. Explain the important events in the field of astronomy and space exploration in the next 20 years
8. Explain the discovery and development of the radiotelescope
9. Explain the special uses of the radiotelescope and give its purpose
10. Identify the methods for using balloon observatories
11. Describe examples of satellites and other exploratory spacecraft
12. Explain the efforts in exploring the Solar System
13. Explain the important events in the field of astronomy and space exploration in the next 20 years



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Writing

- W.9-10.1. Write arguments to support claims in an analysis of substantive topics or texts...
- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.2. Integrate multiple sources of information presented in diverse media or formats...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks...

Language

Module 3 Chapter 12: NS2-M3C12 – Introduction to Astronomical Observations

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 2. History

- D2.His.3.9-12. Use questions generated about individuals and groups to assess how the significance of their actions changes over time and is shaped by the historical context.
- D2.His.5.9-12. Analyze how historical contexts shaped and continue to shape people's perspectives.
- D2.His.14.9-12. Analyze multiple and complex causes and effects of events in the past.

Next Generation Science Standards (NGSS)

HS.Space Systems

- HS-ESS1-1. Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy that eventually reaches Earth in the form of radiation.
- HS-ESS1-2. Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.

HS.History of Earth

- HS-ESS1-6. Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history.

HS.Waves and Electromagnetic Radiation

- HS-PS4-5. Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.*

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

Chapter 12 / Section 1: NS2-M3C12S1 – Telescopes

(Section 1 of 3)

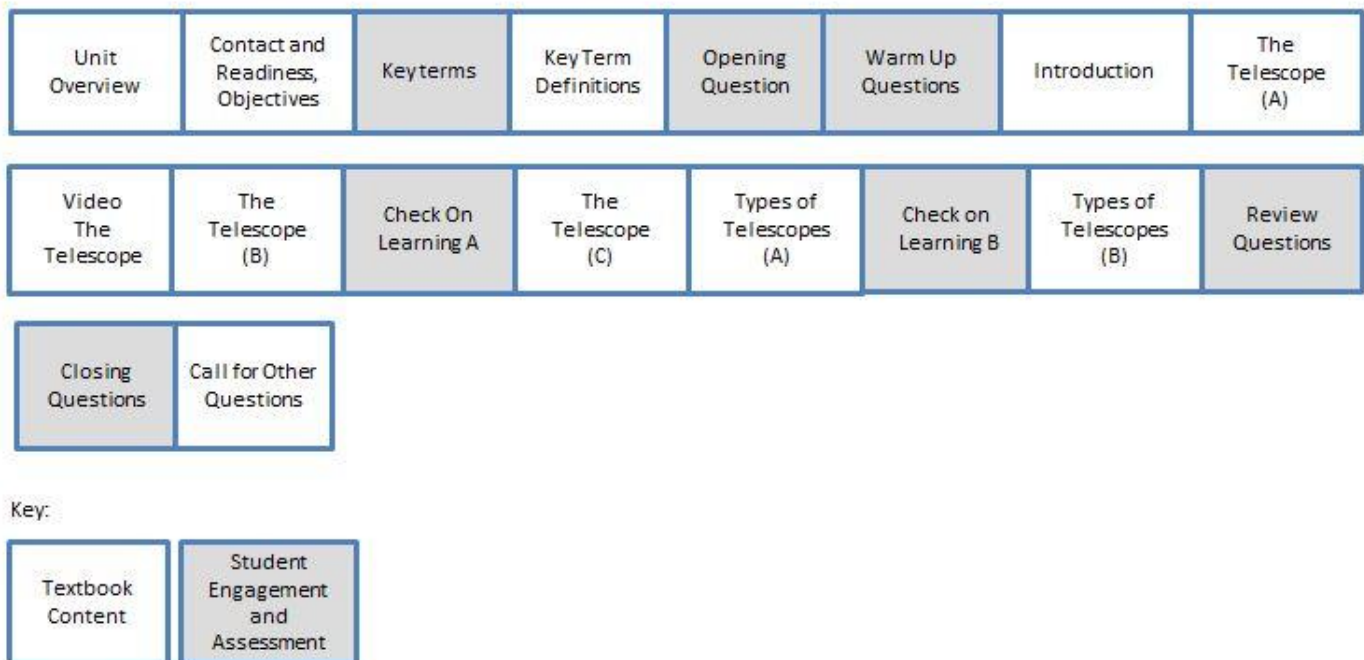
What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars and planets

Skills and Knowledge to be Gained:

1. Explain the theories of the creation of the universe
2. List the methods for astronomical observation
3. Describe the methods for using the telescope
4. Identify the types of telescopes

LESSON FLOW OUTLINE



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 12. Place a checkmark beside the NS2-M3C12S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C12S1 - Key Terms and NS2-M3C12S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 12 / Section 1: NS2-M3C12S1 – Telescopes

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Unit Overview	Explain that astronomy is the study of the universe—in particular, the study of the stars and other heavenly bodies, and their composition, motion, position, and size. You might ask, “Why delve into the mysteries of the universe? What does an astronomer produce or achieve?” The product of astronomy is a greater knowledge and understanding of the universe. True, much of this knowledge has not yet been used directly.	1-3
Unit Overview	Explain that the study of astronomy led to the discovery of the fundamental laws governing all modern technology. Astronomy is directly responsible for the scientific age, which has fundamentally altered our lives. The universe is the most awesome concept in the human imagination. The size of the universe is beyond our comprehension. Earth-based and space-based telescopes have found 1 million galaxies in the Big Dipper alone and they have observed light coming from distant galaxies and other objects over 12 billion light years away.	4
Unit Overview	Explain that there are many theories about the origin of the universe. Since ancient peoples first began to study the world around them, scientists and philosophers have wondered how Earth and the universe came to exist. Although we certainly know more than ancient thinkers did about the origin of things, many questions remain unanswered. Astronomers and other scientists that speculate on the nature of the universe and try to answer these questions are called cosmologists, and their science is called cosmology.	5-6
Unit Overview	Explain that one modern scientific theory of the origin of the universe is called the “Big Bang,” or expanding-universe, theory.	7
Unit Overview	Show video of unit overview and the “Big Bang Theory”	8
Unit Overview	Explain that the “Big Bang Theory” was first proposed in 1927 by the Belgian astronomer Georges Lemaître. His theory has since been supported by many other scientists and a growing body of scientific data. Lemaître postulated that all matter in the universe was originally concentrated in an incredibly dense mass. Packed inside was all the material of today’s universe at a temperature greater than 100 trillion degrees C.	9
Unit Overview	Explain that according to this theory, creation began about 13 billion years ago when a huge explosion sent dust and gas hurtling through space in all directions. As this exploding fireball expanded, particles destroyed one another, releasing high-energy radiation. This resulted in the formation of the proto-sun and proto-planets. Today scientists believe that this expanding motion will never cease. Indeed, studies of the movements of other star groups seem to indicate that all are moving away from us at fantastic speeds.	10
Unit Overview	Explain that because of the extremely high temperatures, all matter in this early central core was separated into protons, neutrons, and electrons. Just after the explosion, however, the temperature dropped enough so that particles could combine. Elements with high atomic weight were created when protons captured large numbers of neutrons. Atomic weight is the average weight of an atom of an element, formerly based on the weight of one hydrogen atom taken as a unit or on 1/16 the weight of an oxygen atom. However, these elements were unstable and quickly decayed into atoms of lesser mass. After 1961, it was based on 1/12 the weight	11-13

Chapter 12 / Section 1: NS2-M3C12S1 – Telescopes

	of the carbon -12 atom. Slow neutron capture produced more stable elements, with low atomic weight. This accounts for the high percentage of hydrogen and helium in the universe and the small amounts of heavier elements.	
Unit Overview	Explain that in May 1992, scientists analyzing data on microwave radiation gathered by an orbiting Cosmic Background Explorer (C.O.B.E.) satellite announced that they had been able to verify the existence of slight temperature variations in space that would have resulted from the Big Bang. This discovery has given further support to the theory—so much so that several prominent cosmologists called it the greatest scientific discovery of the last century.	14
Unit Overview	Explain that cosmologists believe that what is now our solar system (the sun, the planets, and their moons) began about 4.5 billion years ago as a large cloud of gas and dust originating from the Big Bang. This cloud consisted of the “cosmic mix” of molecules found everywhere in the universe—90 percent hydrogen, 9.7 percent helium, and .3 percent heavier elements such as carbon, oxygen, iron, and others.	15-16
Unit Overview	Explain that they also believe small eddies developed within the cloud as it turned in space like a giant whirlpool. A large eddy at the center contracted more rapidly than the rest of the cloud and formed the “proto-sun.” Gradually, forces in the spinning cloud flattened it into the shape of an enormous disk. At a great distance, this disk would have looked somewhat like a gigantic revolving phonograph record, with the proto-sun at the center.	17
Unit Overview	Explain that within this whirling disk, eddies and swirls continued to appear. Some were torn apart in collisions, while others were broken up by the growing gravitational pull of the proto-sun. As this battle continued in the wheeling system, it is thought some local swirls gained material and others lost materials. Finally, a number of these swirls became swirling disks large enough to hold together under the strength of their own gravitational fields. Each was a proto-planet, moving through space around the Sun and sweeping up material left over from the original cloud.	18-19
Unit Overview	Explain that as the proto-sun’s mass was pulled together, collisions, compression, and radioactivity heated the mass until temperatures at the center reached millions of degrees C. In a process called thermonuclear fusion, hydrogen atoms fused (combined under great pressure and temperature) to form helium. It is theorized that this process is the source of the energy that has kept the sun ablaze ever since.	20
Unit Overview	Explain that the thermonuclear fusion at the core of the proto-sun released large amounts of energy and caused the proto-sun to shine. At first a dull red, with time it became the golden yellow star that we see today. Because it was about 100 times larger in diameter than the largest of the proto-planets, it became a star instead of a planet. Its gravitational pull was strong enough to trap light hydrogen atoms in its interior. These atoms fueled the thermonuclear fusion process. Proto-Earth and the other proto-planets were thought to have been born as whirling clouds of ice particles and solid fragments—each a cosmic dust storm. Later, this material collected into balls. Gradually these proto-planets grew by the accumulation of cold dusts from the region of space near them.	21
Unit Overview	Explain it is thought that in time radioactive elements and the compressive action within the cold Earth began to give off heat. After millions of years the temperature became high enough to melt the materials at Earth’s center. The iron, nickel, and other heavy metals spread throughout the ball then began to sink, forming the molten core of the planet. Later, molten rock outside the core (magma) broke through fissures to the surface. This allowed molecules of hydrogen, water vapor, and other gases to escape, creating an atmosphere above the planet’s surface. The oceans were formed when the water vapor released into the atmosphere began to condense and	22-24

Chapter 12 / Section 1: NS2-M3C12S1 – Telescopes

	precipitate. The lighter gases, especially hydrogen, did not stay in the atmosphere long. They left behind a high concentration of the heavier, rare elements of the universe—elements essential for the formation of rocks, plants, and our own bodies.	
Unit Overview	Explain that the undisputed theory of the creation of the universe and solar system has yet to be positively confirmed.	25
Establish contact and readiness; provide lesson overview and objectives review	Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons. In this lesson we will discuss the origin of the universe, astronomical observation, the telescope and types of telescopes.	26-28
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	29
Key terms - Definitions	Reinforce the correct definition for each key term.	30-31
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “What is an observatory, and describe what it is used for?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on an introduction to astronomy.	32
Warm-Up Questions(Lesson questions 1-2)	Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions. Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.	33
Introduction	Explain that until the twentieth century, observations of the heavens were made visually from Earth’s surface, either with the naked eye or, after the Middle Ages, with an optical instrument called the telescope.	34
The Telescope	The telescope is a device that magnifies the image of distant objects.	35
Video on the Telescope	Show video on the telescope.	36
The Telescope	Explain that fortunately, twentieth-century technology has provided methods of observation of the heavens that are far better than the Earth-based optical telescope. These include the spectrograph, radiotelescopes, balloon and spacecraft-borne telescopes, and, since the 1960s, manned spacecraft. Each of these will be discussed below.	37
Check on Learning Questions A (Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	38

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The Telescope	Explain that there are many different sizes and types of optical telescopes. They range from portable models designed for the amateur, a few inches in diameter and a couple of feet in length, to giant reflecting telescopes with computer-driven aiming machinery mounted in buildings called observatories.	39
The Telescope	Explain that giant reflecting telescopes are used primarily by professional astronomers, who make most of their observations by means of time-exposure photography, rather than visual sightings. If we were to take a trip to an observatory during “working” hours, it would be at night. We probably would have to drive up a high hill or even a mountain to get there. The large research observatories are located in remote places away from the lights, smoke, and smog of the cities. On the mountaintop the air is thinner and more clear, eliminating as much atmospheric haze as possible. Ideally, the observatory is built in a location where the weather affords a maximum number of clear nights with “steady atmosphere.”	40
The Telescope	Explain that the distinguishing feature of an observatory is its great revolving dome. Through a slit-like opening in this dome, the telescope peers into the night sky. Except for the hum of motors and the click of switches, all is quiet as the astronomers direct the telescope at the desired spot in the heavens. The whole dome can be made to turn to point the telescope at stars or planets anywhere in the sky.	41
The Telescope	Explain that today the telescope and its fine cameras are usually operated by computers. The astronomical photographs are taken on sensitive photographic glass plates instead of on film. Glass plates do not curl and can be stored and handled with greater ease. Time exposures are used because the plate must store up the feeble light received from the stars, perhaps for hours. Such time exposures reveal the movement of the planets, asteroids, meteors, and comets against a background of stationary stars.	42-43
The Telescope	Explain that the astronomer is much more than a mere “star-gazer.” When working with optical equipment in an observatory one must be an electronics technician, photographer, and computer operator. During the day the astronomer must be a mathematician, physicist, chemist, mechanic, research analyst, and office manager. The library of the observatory maintains a filing system of photographs and written records. Research and laboratory work goes on every working day, and in observatory shops new astronomical instruments are continually being developed.	44
Types of Telescopes	Explain that the telescope is the most important object in the observatory. There are two principal types of telescopes: the refracting and the reflecting telescopes. Both types can be fitted with spectrographs to photograph the color spectrum of incoming light.	45
Types of Telescopes	Explain that the magnifying power of a telescope is important only in observing nearby celestial bodies, since the stars cannot be magnified. In observing the stars, the light-gathering power of the telescope becomes all-important. The amount of light a telescope can collect depends entirely on the area of its main lens or mirror. The larger the lens or mirror, the brighter the star will appear.	46
Types of Telescopes	Explain that the refracting telescope uses two lenses. There is a single convex (outwardly curved) lens called the objective lens at the end of the telescope. This lens forms a reduced, inverted image of the celestial body being viewed called the objective image. The eyepiece lens then magnifies this image, making the object appear closer and enlarged.	47-49
Types of Telescopes	Explain that the largest refracting telescope in the world is located at the Yerkes Observatory at Williams Bay on Lake Geneva, Wisconsin. Operated by the University of Chicago, this refractor has an objective lens with a diameter of 40 inches.	50-51

Chapter 12 / Section 1: NS2-M3C12S1 – Telescopes

Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	52
Types of Telescopes	Explain that Sir Isaac Newton is credited with developing the first telescope in 1672. This type of telescope uses an objective mirror in place of the objective lens. The slightly concave (inwardly curving) mirror forms an image which is then reflected by a secondary mirror to where the eyepiece magnifier is mounted.	53-54
Types of Telescopes	Explain that there are two types of reflecting telescope. One type is the Newtonian telescope and the other is the Cassegrain telescope. In the Newtonian reflector, a flat secondary mirror reflects the light and brings it to a focus at the side of the telescope. In the Cassegrain reflector, the secondary mirror causes the light to focus behind the objective mirror. Thus the objective mirror must have a hole in the center to allow light to pass through. The eyepiece is then placed at the bottom of the telescopic tube. Cassegrain reflectors are much more expensive than Newtonian reflectors and are specially designed for telescopes with large mirrors.	55-57
Types of Telescopes	Explain that the world's largest conventional reflecting telescope with a single one-piece primary mirror in existence today is the 327-in (8.3-meter) Subaru telescope at the Mauna Kea Observatory in Hawaii. In 2005, a side-by-side assembly of two similar but slightly larger 331-in (8.4-meter) diameter mirrors became operational at the Mt. Graham International Observatory near Safford, Arizona. Called the Large Binocular Telescope, it can achieve the same image sharpness as a 22.8-meter mirror. Another variation of the same idea is the recently completed Very Large Telescope (VLT) at a European Southern Observatory in northern Chile. An interferometer telescope is the equivalent of a 630-inch conventional telescope. This can combine the images of an array of four separate 8.2-meter telescopes in a technique called optical interferometry to achieve the same light-gathering ability as a 16-meter mirror.	58-61
Types of Telescopes	Explain that technical problems with large mirrors led to innovative designs such as this 36-segment mirror. Each segment is computer controlled to a tolerance of less than one millionth of an inch. One such telescope is the Southern African Large Telescope (S.A.L.T.) located at Sutherland, South Africa.	62-63
Types of Telescopes	Explain that for the future, sponsors such as the European Southern Observatory have proposed to build an immense 100-meter reflecting telescope of this design (called appropriately the Overwhelmingly Large Telescope [O.W.L.]), at a location yet to be determined.	64
Types of Telescopes	Explain that because of their huge size and great precision, notwithstanding some atmospheric distortion, all these latest telescopes are able to greatly exceed the light-gathering capability and resolution of smaller space-based telescopes like the Hubble. Thus, they are enabling Earth-bound astronomers to make observations of such things as planets orbiting distant stars and galaxies near the edges of the universe that would have been impossible only a few years ago.	65-66
Review Question	The Review Question is, "Name and describe the two main types of telescopes." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	67

Chapter 12 / Section 1: NS2-M3C12S1 – Telescopes

Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	68
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	69

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handout for Take Home Activity

The following is the list of diameters of the planets and sun and a suggested item to use to represent it. We will use a roughly 100,000 miles to the inch scale for this exercise.

•Sun	864,327 miles	8.6 inch	balloon or ball
•Mercury	3,032 miles	.03 inch	pin head
•Venus	7,521 miles	.08 inch	pepper corn
•Earth	7,926 miles	.08 inch	pepper corn
•Mars	4,222 miles	.04 inch	pin head
•Jupiter	88,898 miles	.9 inch	1 inch gum ball
•Saturn	74,898 miles	.7 inch	hazelnut
•Uranus	31,763 miles	.3 inch	coffee bean
•Neptune	30,778 miles	.3inch	coffee bean

You can use anything you'd like. The size should just be close and it does not have to be round. The point you will be making is the planets are really quite small and a very long way away from the sun. For the planets you could use a piece of paper with a colored circle of the appropriate size, but a close approximation with an object should have a greater impact on the students.

When: This is a good activity to do at the end of the lesson. This activity must be done outside, and will require at least 20 minutes. The class has discussed the solar system, but do they really understand the scale?

- With the class: The three pins must be stuck through pieces of card, otherwise their heads will be virtually invisible. If you like, you can fasten the other planets onto labeled cards as well.
- Present all the objects out on a table and setting them in a row. Have the student's place them in the correct order of the planets and by the correct size (use the correct object).
- Point out the contrast between the Sun and the tiny planets. Place the Earth (peppercorn) next to the balloon and note the size difference.
- Now ask the students how far apart do they need to be at this scale? A few feet, yards, the width of the class room?

Clearly, it will be necessary to go outside.

Chapter 12 / Section 1: NS2-M3C12S1 – Telescopes

- Hand the sun and the planets to members of the class, making sure that each knows the name of the object he or she is carrying, so as to be able to produce it when called upon.
- You will have found in advance a spot from which you can walk 774 yards in something like a straight line. Straightness of the course is not essential; nor do you have to be able to see one end of it from the other. You may have to "fold" it back on itself.
- Put the Sun down, and march away as follows. The students can use a yard stick or practice pacing first and do the steps together as the measurement.
- 10 yards. Call out Mercury, and have the Mercury-bearer put down their card and pinhead, weighting it if necessary.
- Another 9 yards. Venus
- Another 7 yards. Earth** (See below)

Already the thing seems beyond belief. Mercury is supposed to be so close to the sun that it is merely a scorched rock and we never see it except in the sun's glare at dawn or dusk-yet here it is, utterly lost in space! As for the Earth, who can believe that the sun could warm us if we are that far from it? The correctness of the scale can be proved. The apparent size of the sun, 26 yards away, is now the same as that of the real sun-half a degree or arc, or half the width of your little finger held at arm's length. (If both the size of an object and its distance have been scaled down by the same factor, then the angles must be the same.)

- Another 14 yards. Mars
- Another 95 yards to Jupiter. The largest planet in the solar system - but it is a chestnut, about a city block from its nearest neighbor in space.
- Another 112 yards. Saturn
- Another 249 yards. Uranus
- Another 281 yards. Neptune
- And if you want another 242 yards. Pluto

Have the class now look towards the sun is it even still visible?

The moon, on our scale, is 2.4 inches from the Earth.

**You can, on reaching the position for the Earth, pause and put down a Moon beside it. This Moon will have to be another pinhead (theoretically between the sizes of Mercury and Pluto). Look down on this distance, the length of your thumb; the greatest distance that Man has yet leaped from his home planet.

Discuss our proposed manned mission to Mars now being suggested (14 yards in our model) or the trips proposed in science fiction: to Jupiter as in the film 2001 Space Odyssey (109 yards); to the nearest star (four thousand miles in our model); to the Andromeda Galaxy (half a million times farther again). A thousand miles, in our model, is the distance called a light-year (in reality, about six million million miles). The distance to the nearest star, Proxima Centauri, is 4.2 such light-years. (4,200 miles, more than the distance across the United States)

Light travels 186,283 miles (or 299,793 kilometers) per second. It could travel, for instance, 7 1/2 times around the Earth in one second. A "light-year" is the distance light travels in a year, and similarly we can call the distance light travels in a second a "light second," etc.

Chapter 12 / Section 1: NS2-M3C12S1 – Telescopes

B. Take Home Activity: In today's lesson we discussed the different types of telescopes used to examine the heavens. But remember, astronomy started by just looking up and observing what was happening in the night sky. Have the cadets go outside and look up at the skies tonight. Have them be an early astronomer and sketch a portion of the sky that they can see. Make sure they name any of the stars or planets that they saw?

(There are many web sites that will provide a real time star map for your location and time both time of day and time of the year. There are even apps that may be downloaded for free on your phone. Many of the web sites are sponsored, so no specific web site is given to avoid promoting any business providing the free service or copyright infringement.)

IV. Evaluation - see CPS database for chapter test questions.

Chapter 12 / Section 1: NS2-M3C12S1 – Telescopes

Activity 1: Take Home Activity – Focus on You

Name: _____ Date: _____ Class: _____

Directions: In today's lesson we discussed the different types of telescopes used to examine the heavens. But remember, astronomy started by just looking up and observing what was happening in the night sky. Go outside and look up at the skies tonight. Be an early astronomer and sketch a portion of the sky that you can see. Name any of the stars or planets that you see

(There are many web sites that will provide a real time star map for your location and time both time of day and time of the year. There are even apps that may be downloaded for free on your phone.)

Chapter 12 / Section 2: NS2-M3C12S2 – The Radiotelescope

(Section 2 of 3)

What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: moon, sun, stars and planets

Skills and Knowledge to be Gained:

1. Explain the discovery and development of the radiotelescope
2. Explain the special uses of the radiotelescope and give its purpose
3. Identify the methods for using balloon observatories

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	The Radiotelescope (A)	Check On Learning A	The Radiotelescope (B)	Special Uses of the Radiotelescope (A)
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Check on Learning B	Special Uses of the Radiotelescope (B)	Airborne Observations	Review Questions	Closing Questions	Call for Other Questions
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Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 12. Place a checkmark beside the NS2-M3C12S2 PowerPoint presentation, and these two CPS question deck files: NS2-M3C12S2 - Key Terms and NS2-M3C12S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 12 / Section 2: NS2-M3C12S2 – The Radiotelescope

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will identify the methods for using the spectrum, along with the discovery and development and special uses of the radiotelescope. We will also talk about balloon observatories</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “What is a radiotelescope and how is it different from an ordinary telescope?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the radiotelescope.	6
The Radiotelescope	Explain that radiotelescopes must be very sensitive in order to detect faint radio waves from space. Also, because the wavelength of radio waves can be thousands of times longer than those of light waves, radiotelescopes must be very large. Since radio waves are so long, however, radio reflectors do not require the precision of optical telescopes. The mirrors on large reflecting telescopes are polished to one-millionth of an inch, the tolerance for light waves. But a radio reflector for long radio waves can be made of iron mesh, with a tolerance of half an inch.	7-8
The Radiotelescope	Explain that the world’s largest steerable radiotelescope is the Robert Byrd radiotelescope at Green Bank, West Virginia. Its dish is oval-shaped, 328 by 361 feet. Other very large ones are at Eifel Mountain near Bonn, Germany, 328 feet; and Jodrell Bank in Cheshire, England, 250 feet in diameter. The world’s largest stationary radiotelescope, with a diameter of 1,000 feet, is near Arecibo, Puerto Rico.	9-12
The Radiotelescope	Explain that in recent years, it has been found that an array of several radiotelescopes can work together to form a giant radiotelescope. Such an array of about thirty receivers at the National Radio Astronomy Observatory at Socorro, New Mexico, can produce images of the radio sky that rival optical telescopes in precision.	13
The Radiotelescope	Explain that because some celestial bodies are too far away or too cold to radiate visible energy, the radio “star map” or radio source map of the sky does not correspond with an actual map of the stars. Radio astronomers have found many huge regions of high-speed gases and the remnants of celestial supernovae explosions.	14
Check on Learning Questions A (Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	15

Chapter 12 / Section 2: NS2-M3C12S2 – The Radiotelescope

The Radiotelescope	Explain that sunspots also give off radio waves, as does the corona of the sun. A corona is a white or colored circle or set of concentric circles of light seen around a luminous body like the sun. They have also discovered pulsars, which are bodies that radiate energy at regular intervals. Once thought to be artificial beacons, they are now considered to be rapidly rotating compressed stars in the last stages of stellar life.	16-18
The Radiotelescope	Explain that spectroscopes and radiosopes have found that hydrogen and helium make up 99% of all matter in the universe. No matter where astronomers have searched in space, the universe appears to be made up of the same elements. Radiotelescopes have also found molecules such as amino acids in space. No optical device could have accomplished this feat.	19-21
Special Uses of the Radiotelescope	Explain that while radiotelescopes normally are used only to receive radio waves, it is possible to modify these devices for other purposes. The radiotelescope can direct powerful radio beams at a celestial object and then receive them when they rebound toward Earth. Radiotelescopes equipped with such transmitters are often called radar telescopes. Because radio waves travel at the speed of light, radar telescopes can furnish accurate data about the distance of celestial bodies near Earth.	22-23
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	24
Special Uses of the Radiotelescope	Explain that by using various wavelengths, information about the composition of these bodies can be obtained.	25
Special Uses of the Radiotelescope	Explain that radiotelescope technology has also showed that not all radio waves from space come from swirling, excited gases and celestial bodies. A particular kind of wave was found to be emitted by the cool, quiet hydrogen clouds strewn throughout space. Mapping these hydrogen radio signals has enabled astronomers to pierce the dusty regions of space through which light rarely passes. Such maps told them that our Milky Way galaxy is shaped like a pinwheel, and that it rotates, carrying the sun and the planets with it. Until the radiotelescope, scientists could only speculate that this was the case, as it is with many other galaxies.	26-27
Special Uses of the Radiotelescope	Explain that recently, radiotelescopes have also been used to control and receive data from spacecraft exploring our solar system. In the controlling mode, they send very strong signals radiated at high power levels (300,000 to 400,000 watts) to reach the distant spacecraft, then listen for the faint replies and data transmissions, which are often only a few fractions of a millionth of a watt strong.	28
Airborne Observations	Explain that the atmospheric shield that protects Earth from radiation also distorts the light that gets through to our telescopes on Earth. In order to gain more accurate knowledge of the universe, we have to go beyond our atmosphere. For this purpose, astronomers use high-altitude balloon observatories that can go up to about 20 miles above the surface. In these balloons, they are above 99 percent of the atmosphere. Most of the distortion is eliminated when using a balloon observatory.	29-30
Airborne Observations	Explain that although relatively new, balloon astronomy is playing a great part in the study of the universe. Balloons are much cheaper than spacecraft and can easily carry people aloft in their gondolas. They also can carry up to two tons of telescopes, spectrographs, and other instruments. The pictures and other findings can be brought directly down to Earth, rather than sent by radio transmission, as from satellites.	31

Chapter 12 / Section 2: NS2-M3C12S2 – The Radiotelescope

Airborne Observations	Explain that though balloons have their advantages, they also have several disadvantages. They are difficult to stabilize, they are not self-propelled, and the upper atmosphere causes observational distortions. Consequently, astrophysicists and astronomers in recent years have found the space-based platforms discussed in the following section far more useful.	32-33
Review Question	The Review Question is, “Discuss how radio telescopes are used to observe celestial bodies.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	34
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	35
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	36

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Old dial tuned AM radio (a digital AM radio can be used, but you have to find a channel with nothing on it.

When: This is a good activity to do at the beginning of the lesson

With the class: Turn the radio on and tune it to a station with nothing but static.

Ask the students: What are we listening to?

Have the students develop with a peer what they think may be causing the radio waves. If the students seem to get stuck with just a few items you may make one or more of the following suggestions to guide them:

- Man-made sources
 - radio
 - TV
 - GPS
 - satellite TV and radio
 - electronic and electrical devices (an electric pencil sharpen turned on next to the radio will demonstrate this very well)
- Naturally occurring sources
 - lightning
 - the natural decay of radioactive elements in the earth
 - stars (our sun)
 - pulsars
 - quasars
 - entire galaxies (appear as a single source at great distances)
 - elements changing state due in space
 - background energy left over from the theoretical ‘Big Bang’

Chapter 12 / Section 2: NS2-M3C12S2 – The Radiotelescope

Discuss the following questions as a class:

- What are the sources of these radio waves that we hear now?
- What if we could aim the antenna so that we were not listening in all directions at once?
- Do radio waves travel through dust particles unlike light which is blocked by them? (example, you hear the radio signal inside a room of your house or school)
- How do we tell how far away a radio signal may be traveling from?

B. At Home Activity: In today's lesson you learned about radio astronomy and radio telescopes. In the previous lesson we learned about optical telescopes that use either mirrors or lenses to gather more light to allow astronomers to see fainter objects (which translates in many cases to further objects). In this assignment you will use the concept of a curved mirror to collect light which was used in reflecting and compound telescopes (Cassegrain) to examine how a radio telescope collects more radio energy to be able to detect faint radio waves. Radio waves travel in exactly the same way as infrared heat waves travel from our sun. Your task is to make a parabolic solar dish to concentrate the infrared heat coming from the sun. Make a concaved dish out of cardboard, aluminum foil, tape, and a wire coat hanger.

You may make this a group project, and a competition as well. See which student's or group's dish is able to roast a marshmallow the fastest.

Have students describe what is happening and how this is similar to a radio telescope.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 12 / Section 3: NS2-M3C12S3 – Satellites and Exploratory Spacecraft

(Section 3 of 3)

What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: moon, sun, stars and planets

Skills and Knowledge to be Gained:

1. Describe examples of satellites and other exploratory spacecraft
2. Explain the efforts in exploring the solar system
3. Explain the important events in the field of astronomy and space exploration in the next 20 years

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Warm Up Questions	Satellites and Exploratory Spacecraft (A)	Videos 1 & 2 Satellites and Exploratory Spacecraft	Satellites and Exploratory Spacecraft (B)
Check On Learning A	Satellites and Exploratory Spacecraft (C)	Video 3 Satellites and Exploratory Spacecraft	Satellites and Exploratory Spacecraft (D)	Video 4 Satellites and Exploratory Spacecraft	Satellites and Exploratory Spacecraft (E)	Videos 5 & 6 Satellites and Exploratory Spacecraft	
Satellites and Exploratory Spacecraft (F)	Check on Learning B	Satellites and Exploratory Spacecraft (G)	Video 7 Satellites and Exploratory Spacecraft	The Future	Review Questions	Closing Questions	Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 12. Place a checkmark beside the NS2-M3C12S3 PowerPoint presentation, and these two CPS question deck files: NS2-M3C12S3 - Key Terms and NS2-M3C12S3 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 12 / Section 3: NS2-M3C12S3 – Satellites and Exploratory Spacecraft

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons. In this lesson we will talk about satellites and exploratory spacecraft. We will also explain the efforts in exploring the solar system and finish with the important events in the field of astronomy and space exploration in the next 20 years.	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-7
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Discuss what types of information that have been collected about the Earth and solar system from the Explorer 1 and other Explorer reconnaissance spacecraft.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on satellites and exploratory spacecraft.	8
Satellites and Exploratory Spacecraft	Explain that the true beginning of the space age was 4 October 1957, when the first artificial satellite, Sputnik I, was successfully launched by the Soviet Union. Sputnik I was followed four months later by the first U.S. satellite, Explorer I. Since then there has been a steady procession of artificial satellites and other spacecraft sent into space on scientific astronomical missions.	9
Satellites and Exploratory Spacecraft	Explain that Explorer I was fitted with a device designed to map Earth’s magnetic field by measuring the energies of incoming charged particles at different levels of the outer atmosphere. Although it failed at this, it succeeded in providing a count of charged particles trapped in previously unknown bands around Earth far above the upper atmosphere—the now familiar Van Allen radiation belts.	10-11
Satellites and Exploratory Spacecraft	Explain that since that time, many astronomical spacecraft have been launched into space by NASA, by the former Soviet Union, and by several other nations since 1958.	12
Videos 1 and 2 on Satellites and Exploratory Spacecraft	Show videos 1 and 2 on satellites and exploratory spacecraft	13-14
Satellites and Exploratory Spacecraft	Explain that some of the spacecraft launched by N.A.S.A. Some of these, including the Apollo missions of the late 1960s, the American Skylab orbited in 1973, the Russian M.I.R. space station that orbited between 1986 and 2001, and most recently the International Space Station, have been manned. The astronomical data and new knowledge gained by these spacecraft during the last forty years has greatly exceeded	15-16

Chapter 12 / Section 3: NS2-M3C12S3 – Satellites and Exploratory Spacecraft

	the total knowledge acquired by all previous earthbound observations since the dawn of history.	
Satellites and Exploratory Spacecraft	<p>Explain that since 1957, the study of our solar system by manned and unmanned spacecraft has been done in three distinct phases:</p> <ul style="list-style-type: none"> • The reconnaissance phase consists of flybys, photography, and, more recently, TV imaging. • The exploration phase involves the use of orbiter and probe (exploratory) spacecraft to do detailed mapping and measurement. • The intensive study phase uses manned and unmanned landers and space probes for close-up examination and experimentation. 	17-20
Satellites and Exploratory Spacecraft	<p>Explain that other various explorer spacecraft included:</p> <ul style="list-style-type: none"> • ACE - Advance Composition Explorer • FUSE - Far Ultraviolet Spectroscopic Explorer • IMEX - Inner Magnetosphere Explorer • IRAS - Infrared Astronomical Satellite <p>After some 50 additional Explorer reconnaissance missions, extensive data about the Earth and its region of the solar system was collected.</p>	21-22
Satellites and Exploratory Spacecraft	<p>Explain that information about the Earth and its region of solar systems included:</p> <ul style="list-style-type: none"> • The nature and effect of the solar wind • The nature, extent, and behavior of Earth's magnetosphere (Earth's magnetic field) • A detailed survey of the space between Earth and the moon • The nature and density of Earth's upper atmosphere 	23-24
Satellites and Exploratory Spacecraft	Explain that between 1962 and 1975, a total of eight orbiting solar observatories (O.S.O.'s) were launched into orbit around Earth to study the sun. Their instruments returned much data on solar flares, the sun's corona (outer atmosphere), and solar activity in the gamma ray, x-ray, and ultraviolet bands of the electromagnetic spectrum.	25
Satellites and Exploratory Spacecraft	Explain that the Skylab and O.S.O. data "rewrote the book" on solar physics, our understanding of how and why the sun functions, and the effects the sun has on terrestrial weather and communications. Skylab contained a group of eight solar observation instruments and cameras. During the time it was manned, between May 1973 and February 1974, about 150,000 observations of the sun were made. These produced many spectacular photos of solar flares and sunspots.	26-27
Satellites and Exploratory Spacecraft	Explain that while these spacecraft were investigating the nature of near-Earth space, a series of eleven Pioneer spacecraft began a reconnaissance of the remainder of the solar system.	28
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	29
Satellites and Exploratory Spacecraft	Explain that Pioneer 10 and Pioneer 11, launched in 1972 and 1973, were the first spacecraft to fly by and photograph Jupiter and Saturn. For many years afterward, they were the most distant artificial objects from Earth, until they were overtaken in 1998 by a later but faster Voyager spacecraft.	30

Chapter 12 / Section 3: NS2-M3C12S3 – Satellites and Exploratory Spacecraft

Satellites and Exploratory Spacecraft	Explain that Pioneer 10, launched in 1972, crossed the orbit of Pluto, the outermost known planet, in 1986, becoming the first artificial object to escape the solar system. It is now about 7.6 billion miles from Earth. Its last, weak transmission was received in 2003; nothing further has been received since. Pioneer 11, which followed a different path in order to fly by Saturn in 1979, passed Pluto in 1994.	31-35
Satellites and Exploratory Spacecraft	Explain that Pioneer and two follow-on Voyager spacecraft launched in 1977, all returned telemetry data (instrumentation readings) from the outer regions of our solar system.	36
Satellites and Exploratory Spacecraft	Explain that Mariner reconnaissance spacecraft conducted orbital surveys of Mars in the late 1960's and of Venus in the early 1970's	37
Video 3 on Satellites and Exploratory Spacecraft	Show video 3 on satellites and exploratory spacecraft.	38
Satellites and Exploratory Spacecraft	Two Viking landers made soft landings on the Martian surface in the mid-1970's.	39
Video 4 on Satellites and Exploratory Spacecraft	Show video 4 on satellites and exploratory spacecraft.	40
Satellites and Exploratory Spacecraft	<p>Explain that the two Viking landers sent back hundreds of pictures of the Martian terrain and conducted experiments to try to determine whether microbial life-forms exist in the soil. Several Soviet probes fitted with parachutes penetrated the atmosphere of Venus in the 1970's and 1980's and radioed back some pictures of the surface and data on temperatures and pressures until they overheated and shut down.</p> <p>Explain that a pair of Soviet reconnaissance probes conducted a close flyby of Halley's comet during its 1986 swing through the solar system, confirming among other observations that the head of the comet is composed primarily of dirty ice.</p>	41-43
Satellites and Exploratory Spacecraft	Explain that in 1989, the Magellan spacecraft fitted with an advanced radar imaging device was launched to produce a detailed map of the surface of Venus. It arrived in orbit over the planet in 1991 and began its task, which ended in 1994 with an intentional plunge into the Venusian atmosphere. Its spectacular results are summarized in chapter 4 of this unit. Also in 1989, the Galileo spacecraft was launched as a follow-on to the Voyager mission to Jupiter conducted in 1979.	44-45
Satellites and Exploratory Spacecraft	Explain that on its way it, passed close by the asteroids Gaspra and Ida and sent back several pictures of the asteroids. Galileo arrived at Jupiter in December 1995 and began a mission to take detailed observations of the planet and its moons. It also relayed back telemetry from a probe that it released months before that plunged into the Jovian atmosphere.	46-47
Satellites and Exploratory Spacecraft	Explain that in 1990, N.A.S.A. began its Great Observatories Program by launching into orbit the first of an eventual four orbiting space telescopes, each designed to observe a different band of radiations within the electromagnetic spectrum—visible, gamma rays, X-rays, and infrared. The Hubble Space Telescope, the first and probably best known of these of the orbiting space telescopes, was placed in orbit around Earth by a space shuttle mission in April, 1990. Its telescope system proved flawed, and had to be	48

Chapter 12 / Section 3: NS2-M3C12S3 – Satellites and Exploratory Spacecraft

	repaired during a subsequent shuttle mission in 1993. It is still in operation today and has provided many astounding images that have added much to astronomers' knowledge of the universe and its origins.	
Satellites and Exploratory Spacecraft	Explain that in 2009 N.A.S.A. launched the Kepler Space Telescope to discover planets orbiting other stars, called exoplanets. Kepler's field of view is ten times larger than the Hubble's telescope thereby giving it much greater capability to discover exoplanets.	49
Satellites and Exploratory Spacecraft	Explain that in September 1992, a Mars Observer spacecraft was launched to do detailed photographic mapping of the Martian surface, but unfortunately all contact with it was lost as it approached Mars in August, 1993. Two more exploratory spacecraft were launched to Mars by the United States during 1996. They arrived in July and September, 1997. Several more were launched during the next several years. More about them is presented in chapter 4 of this unit.	50-51
Satellites and Exploratory Spacecraft	Explain that in addition to the foregoing unmanned exploratory efforts, in the 1960's, the United States made a determined effort to put an astronaut on the moon by the end of that decade. The effort began with several Mariner and Surveyor spacecraft that conducted orbital mapping of the lunar surface in the early 1960s, and ended with the successful landing of Apollo 11 on the moon's surface in 1969.	52
Videos 5 and 6 on Satellites and Exploratory Spacecraft	Show videos 5 and 6 on satellites and exploratory spacecraft	53-54
Satellites and Exploratory Spacecraft	Explain that Five additional manned lunar landings and explorations were conducted, the last being Apollo 17 in late 1972.	55
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	56
Satellites and Exploratory Spacecraft	Explain that in February 1986, the Soviet Union launched the first components of a small space station called M.I.R. into an elliptical orbit between 300 and 400 kilometers high. Though originally intended to last only about seven years with an intermittent crew of two cosmonauts, additional modules to enlarge it and extend its life were added. It was more or less manned by Russians and occasional visitors from other nations, including the United States, from 1989 until it was brought down from orbit in 2001. (A cosmonaut is a Russian or Soviet astronaut.)	57-59
Satellites and Exploratory Spacecraft	Explain that in 1998, the first components of a new International Space Station were launched, with parts to be eventually contributed by sixteen nations. Two years later, in November 2000, the first crew of one American and two Russians arrived at the station, and it has been permanently manned since then.	60-61
Satellites and Exploratory Spacecraft	Explain that the International Space Station (I.S.S.) is the largest and most complex international scientific project in history. It draws upon the scientific and technological resources of 16 nations: United States, Canada, Japan, Russia, and 11 nations of the European Space Agency and Brazil.	62
Satellites and Exploratory Spacecraft	Explain that over the next few years, additional components will be added to take its eventual weight to 453 metric tons. Many missions to Mars are planned with a possible manned mission by 2020.	63

Chapter 12 / Section 3: NS2-M3C12S3 – Satellites and Exploratory Spacecraft

Satellites and Exploratory Spacecraft	Explain that U.S. space shuttles flew most of the support missions to the I.S.S. With the retirement of the U.S. shuttle fleet in 2011, unmanned American, Russian, E.S.A., and commercial spacecraft deliver supplies and equipment. The I.S.S is currently funded through at least 2020.	64
Video 7 on Satellites and Exploratory Spacecraft	Show video 7 on satellites and exploratory spacecraft.	65
The Future	Explain that the next few years should be exciting years in the field of space exploration. Many additional missions to the planet Mars are planned over the next decade, perhaps culminating in a manned mission sometime before the year 2020.	66
The Future	Explain that a mission called New Horizons launched in January 2006 and will fly by Pluto and its moons (Charon and two new moons) in 2015.	67
The Future	Explain that a follow-on mission to Galileo’s exploration of Jupiter and its moons called Juno was launched in August 2011 and will arrive at the planet in July, 2016. It will be placed in a polar orbit around Jupiter to investigate its gravity field, magnetic field, and magnetosphere.	68
The Future	Explain that the Space Infrared Interferometric Telescope (S.P.I.R.I.T.) will consist of two moveable telescopes mounted on a 120-foot beam scheduled for launch sometime after 2020. The James Webb Space Telescope (J.W.S.T.) is a large infrared observatory due to be launched in 2018 as a replacement to the Hubble Space Telescope. More amazing observations and photos of the heavens will be taken from the Hubble Space Telescope.	69-72
The Future	Explain that the search for extraterrestrial life in the solar system and beyond will be an ongoing quest for the foreseeable future. In addition to the investigations of the S.E.T.I. organization mentioned in this chapter, over the last decade astronomers using both space-based and terrestrial telescopes have discovered the presence of over 150 planets orbiting distant stars. If it could be shown that the formation of planets is a fairly common occurrence in the universe, statistics would then indicate that the probability of at least some form of life existing elsewhere in our universe is fairly high. Such a discovery would rank among the greatest scientific achievements of all time, with great consequences for humankind.	73-74
Review Question	The Review Question is, “Describe and discuss the future of space exploration.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	75
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	76
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	77

Chapter 12 / Section 3: NS2-M3C12S3 – Satellites and Exploratory Spacecraft

III. Supplemental Activities -

A. In Class Activity:

Supplies required: none

When: This is a good activity to do at the end of class.

- With the class: Divide the class into two groups. We have discussed the exploration of space in today's lesson. We have touched on the new things that we have learned about our own planet, solar system, local galaxy, and the universe in general. Many things that we use today were initially developed in support of our desire to explore space, such as computers and your cell phones. However, space exploration is expensive. Should the United States have a national space program with a goal to explore other planets and beyond (manned mission), or should the government only conduct less expensive scientific probe missions and allow private industry to become the space explorers?

B. Take Home Activity: We saw the speech of President Kennedy that set the United States on its course to put a man on the moon. That speech motivated America to extreme creativity and scientific and engineering advancements. An entire generation dreamed of the technological advancements associated with space and the idea that they would someday be able to travel to space as well. Today, we have movies and television shows about outer space, but do we still have the desire to travel to space as we did during the 1960's and 70's?

Have the Cadets use the Handout "Space travel" and write a one page essay on why you want to go to space and what kind of job you plan to have after high school to help you get there. Or, write why you do not have a desire to travel to space. What kind of job do you plan to have after high school as well?

IV. Evaluation - see CPS database for chapter test questions.

Chapter 12 / Section 3: NS2-M3C12S3 – Satellites and Exploratory Spacecraft

Activity 1: Take Home Activity – Space Travel

Name: _____ Date: _____ Class: _____

Directions: Write a one page essay on why you would want to go to space and what kind of job you plan to have after high school to help you get there. Or, write why you do not have a desire to travel to space. What kind of job do you plan to have after high school as well?

[illegible]

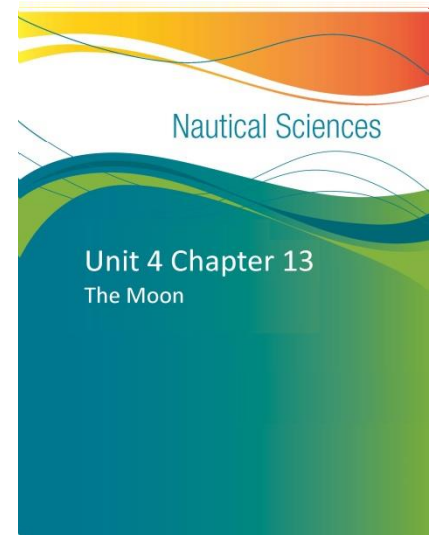
Module 3 Chapter 13: NS2-M3C13 – The Moon

What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars and planets

Skills and Knowledge to be Gained:

1. Recognize basic facts about the Moon such as size, distance from Earth and atmosphere
2. Describe the geographical structure of the Moon
3. Describe the surface features of the Moon
4. Explain those theories that describe Moon craters and their formations
5. Describe the mountain ranges and riles on the surface of the Moon
6. Explain the effect moonquakes have on the Moon
7. Describe how the Moon's motion causes its phases
8. Explain the basic reasons for Moon exploration



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Writing

- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.9-10.7. Conduct short as well as more sustained research projects to answer a question or solve a problem...
- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

Module 3 Chapter 13: NS2-M3C13 – The Moon

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

Chapter 13 / Section 1: NS2-M3C13S1 –The Moon

(Section 1 of 1)

What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars and planets

Skills and Knowledge to be Gained:

1. Recognize basic facts about the Moon such as size, distance from Earth and atmosphere
2. Describe the geographical structure of the Moon
3. Describe the surface features of the Moon
4. Explain those theories that describe Moon craters and their formations
5. Describe the mountain ranges and riles on the surface of the Moon
6. Explain the effect moonquakes have on the Moon
7. Describe how the Moon's motion causes its phases
8. Explain the basic reasons for Moon exploration

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	Check On Learning A	Moon Geology
Check on Learning B	Other Surface Features	Moon Mountains and Rilles	Phases of the Moon (A)	Video on Phases of the Moon	Phases of the Moon (B)	Lunar Exploration Efforts	Why Explore the Moon?
Review Questions	Closing Questions	Call for Other Questions					

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 13 / Section 1: NS2-M3C13S1 –The Moon

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, chapter 13. Place a checkmark beside the NS2-M3C13S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C13S1 - Key Terms and NS2-M3C13S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we begin a study of astronomy, the science of celestial bodies. We will first examine the Moon, because it is our nearest neighbor except for certain asteroids and man-made satellites. We will discuss the Moon's age, size, distance, motion, and atmosphere to learn a little bit about what it is and how it affects the Earth. We will learn about the Moon's geography, that is its physical features. We will discuss the ways in which it is similar to Earth, its surface, and its motion or movement. We will learn about the Moon's phases. We will discuss the phases of the Moon, what causes lunar eclipses and why we should continue to explore the Moon.</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-10
Opening Question(Random Pick a Student – "RPS")	This Opening Question is "How long does it take for the moon to complete one revolution around the earth?" Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on the Moon.	11
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	12

Chapter 13 / Section 1: NS2-M3C13S1 –The Moon

Introduction	Explain that at one time most scientists thought that the Moon and Earth were probably formed at the same time and in about the same way. But analysis of lunar sample material brought back by the Apollo missions showed surprising differences between the compositions of the Moon and Earth. The Moon is iron-poor, with a density about the same as Earth's mantle.	13
Introduction	Explain that consequently, the favored theory now is that shortly after Earth cooled, it was struck a glancing blow by a large object. The impact spewed material from Earth's mantle, which eventually came together to form the Moon. To settle the question, more on-site research needs to be done, perhaps using a base camp that might one day be established on the lunar surface.	14
Introduction	Explain that the Moon's diameter is 2,160 miles, roughly 30 percent that of Earth. The Moon is generally said to be about 239,000 miles away from Earth; this, however, is an average distance. The distance actually varies from about 226,000 miles at the closest to 252,000 miles at the farthest	15
Introduction	Explain that the Moon circles Earth every 27 1/3 days. It also completes one rotation about its axis in the same time period, which accounts for the fact that the Moon always has the same side facing Earth. In other words, the Moon rotates once on its axis and revolves once around Earth in the same length of time.	16
Introduction	Explain that the Moon has no atmosphere. Thus, there is no gradual daily temperature change from hot to cold, as on Earth. On the Moon, a person partially in the sunlight and partially in the shade would feel extreme heat and cold at the same time. The Moon's surface temperature in sunlight may get as high as 243 degrees F. In the dark of the lunar night, it goes down to -261 degrees F.	17
Introduction	Explain that some scientists believe it possible that the Moon is both hot and cold. They believe it has a cold exterior shell or crust, perhaps 250-625 miles deep, surrounding a warm belt of rock, and possibly even a molten core. This would make it much like Earth—except that Earth's outer crust, called the lithosphere, is only about 15 miles thick.	18
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	19
Moon Geology	Explain that the surface of the Moon is pockmarked with craters. The larger circular craters, easily seen through binoculars, have been visible for centuries. There are also smooth plains and mountain ranges on the Moon's surface. Galileo mistook the plains for bodies of water and called each one a mare (plural, maria), the Latin word for "sea." The craters have been named in honor of scientists and philosophers. The mountain ranges are named after mountain ranges on Earth.	20-21
Moon Geology	Explain that the great black maria are younger than the rest of the Moon. They cover up older craters and show fewer signs of meteorite bombardment. Radioactivity measurements of rocks from the Sea of Tranquility show that they were made 3.6 billion years ago—1 billion years later than the Moon or Earth.	22
Moon Geology	Explain that some maria have definite magnetic fields. This was discovered when Mariner reconnaissance spacecraft orbiting the Moon experienced a greater pull of gravity over certain maria. Probably a massive body, such as an iron asteroid, lies under such maria. It is thought that the "seas" welled up when the lunar crust was punctured by a swarm of asteroids, about 2-3 billion years ago.	23

Chapter 13 / Section 1: NS2-M3C13S1 –The Moon

Moon Geology	Explain that these buried super-heavy magnetic concentrations beneath the lunar surface have been named mascons. Mascons are much too heavy to remain on the surface of a molten body. But they are known to be near the Moon's surface, because of the extra gravitational pull they exert on spacecraft in lunar orbit. This lends strength to the belief that the Moon's crust is strong and very thick. If this were not so, the mascons would have sunk into the deepest core of the Moon—especially if the Moon were a soft, molten body.	24
Moon Geology	Explain that there are about twenty maria, and they cover about half of the Moon's surface. Most are on the near side of the Moon. The term maria has been retained, though now they are known to be filled with lava or volcanic ash, not water. Through a telescope the maria look much darker than the craters or mountains. This is because the lunar plains have a lower reflectance. An object that reflected all light would have a reflectance of 100 percent, while one that absorbed all light would have 0 percent. The Moon is actually a rather poor reflector, with a reflectance of only about 11 percent. The Moon gives off no light of its own, but reflects the Sun's light; moonlight, therefore, is reflected sunlight.	25
Moon Geology	Explain that it is still not known how the Moon's craters were formed. One theory says they were formed by the impact of huge meteorites. This theory is supported by the fact that craters on the Moon look much like craters formed by meteorite collisions on Earth. Another theory states that craters were formed by volcanoes. If so, these volcanoes had to be far bigger than any on Earth. Another theory suggests that the craters were formed by the bubbling action of the molten Moon as it cooled.	26
Moon Geology	Explain that a seemingly infinite number of craters cover the Moon's surface. The largest on the near side is Bailly, 183 miles in diameter, but several unnamed ones on the far side are larger than 200 miles in diameter. The craters are the most striking formations on the Moon, and they are present in all sizes. The typical crater has a surrounding ring, which is from 1,000 feet to 20,000 feet high.	27
Moon Geology	Explain that many smaller craters are almost certainly the result of early volcanic activity, as gases and dusts escaped from the Moon's interior. Some of these can be compared to volcanic craters on Earth, formed when the surface of the Earth collapses into an underlying cavity from which lava has flowed. (Often a central peak remains in the center of such craters—for example, the island in Crater Lake, Oregon.)	28
Moon Geology	Explain that the most conspicuous crater is Tycho, in the Moon's southern hemisphere. It is easily seen when the Moon is full. Tycho has a great system of rays, which radiate as far as 1,500 miles out from the edges of the crater. The crater Copernicus has a similar system. Rays are thought to be fine surface material that was splattered out of the most recent impact craters when they were formed. Some rays are chains of small craters, created by the explosive ejection of material during the formation of the main crater.	29-30
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	31
Other Surface Features	Erosion on the Moon takes place very slowly, because there is no rain or wind. However, the Apollo astronauts learned that the spray of breccia—impact material from crashing meteorites and other bodies—causes extensive erosion. The constant stream of atomic particles coming from the Sun and the rest of the cosmos also causes a very slow wearing-away of the Moon's surface.	32

Chapter 13 / Section 1: NS2-M3C13S1 –The Moon

Other Surface Features	Among the lunar rocks that have been returned to Earth are several that scientists have labeled igneous. This means that the rock was once molten magma but later became solidified. This is another indication that the Moon, like Earth, has (or once had) a hot interior and volcanoes.	33
Other Surface Features	The surface walked on by the Apollo astronauts was coated by a thick dust layer called the regolith, which covers the entire surface of the Moon to a depth ranging from a few meters in the maria to ten to twenty meters in the highlands. It is made up mostly of breccia. Various lunar landers and the Apollo astronauts found that the regolith in most places is rather loose on top and compacted underneath.	34
Moon Mountains and Rilles	Explain that the Moon's mountain ranges lie in great arcs bordering the circular maria. Some of their peaks are as tall as the highest Earth mountains. They are concentrated in the Moon's southern hemisphere. With peaks sometimes rising more than 20,000 feet above the plains, lunar mountains are very rugged, since they are not eroded by wind, water, or ice.	35-36
Moon Mountains and Rilles	Explain that a large telescope will also show that the Moon's surface is covered with many cracks, called rilles. They are similar to shallow, flat-bottomed river beds on Earth. There seems to be no connection between rilles and other surface features because they sometimes extend hundreds of miles, uninterrupted by mountains, valleys, or craters.	37
Phases of the Moon	Explain that the Moon's motion in its orbit causes its phases. Since the Moon shines only by reflected sunlight, the relative positions of the Moon, Earth, and Sun determine how much of the Moon we can see at a given time. At new moon, the Moon is between Earth and the Sun, with the dark side facing Earth. Explain that a day or so later the Moon is seen as a thin, bow-shaped figure called a crescent. As the lighted part grows in size, the Moon is said to wax to full moon. At full moon, the entire illuminated side is turned toward Earth, since it is exactly opposite the Sun in the sky.	38
Video on Phases of the Moon	Show Video on phases of the moon.	39
Phases of the Moon	Explain that the full moon rises in the east as the Sun sets in the west; thus, we can see it all night. Sometimes it is so bright it can be seen well into the morning hours after sunrise. When the Moon is halfway between the new moon and the full moon, one-half of the Moon is bright and it is in its first quarter; this means that the Moon is a quarter of a circle (90 degrees) away from the Sun. After full moon, the lighted part gets smaller, and the Moon is said to wane. It goes through its last quarter and back to new moon again. When more than half of the Moon is visible, between the first and last quarters, it is called gibbous.	40
Phases of the Moon	Explain that because Earth and the Moon are both solid bodies illuminated by the Sun, they both cast cone-shaped shadows in space. Occasionally, the Moon passes through the conical shadow of Earth. This event is known as a lunar eclipse. Such an eclipse can be either partial or total, depending on how much of the Moon enters Earth's shadow.	41-44
Lunar Exploration Efforts	Explain that The Apollo manned lunar landing program ran from 1961 to 1972. For the first several years it was concurrently supported by the two-man Gemini capsule program, conducted from 1962–66. The Apollo program succeeded in its goal of achieving a manned landing on the Moon by the end of the 1960s when Apollo 11 landed in the Sea of Tranquility in July 1969.	45

Chapter 13 / Section 1: NS2-M3C13S1 –The Moon

Lunar Exploration Efforts	<p>Explain that the Apollo 11 astronauts set up a moonquake detector at the Sea of Tranquility. This detector was an instrument called a passive seismometer, a device that transmits reports of tremors on the Moon's surface. Scientists had expected the Moon to experience quakes similar to our earthquakes. But they found out that a moonquake causes the Moon to vibrate in an entirely different way. Earth tremors are severe only for seconds: beyond the rather small area of the quake, only the finest instruments can record them. Moonquakes, however, cause the whole Moon to vibrate for extended periods.</p> <p>Explain that in only three weeks after its placement, the Tranquility Base seismometer registered twenty-five different tremors on the Moon's surface. Fourteen of them were from avalanches of lunar rocks falling down the slopes of crater walls. When the Apollo 12 lunar module was purposely crashed back on the surface of the Moon in 1969, the shock set the whole Moon vibrating for nearly an hour. It will take many years and many seismograph stations to explain this and to find out how the interior of the Moon is structured.</p>	46
Lunar Exploration Efforts	The Apollo missions brought back some 2,200 samples (altogether 382 kg, 842 pounds) of Moon rocks and soil for later analysis. Analyzed by the Lunar Receiving Laboratory of NASA in Houston, many of the rock samples were found to be rich in iron, titanium, and magnesium but completely lacking in the hydrated minerals common in Earth rocks.	47-48
Lunar Exploration Efforts	Analysts found about sixty elements in the soil samples, which were determined to be rich in glass breccias and tiny glass tektites (beads) formed by meteorite impacts on the lunar surface. Tiny particles of tektites are no larger than a grain of sand, and make up 25% to 33% of the lunar dust. Some lunar dust sparkles with colorful crystals.	49-50
Lunar Exploration Efforts	Explain that in late 1996 a spectacular discovery of possible water ice on the Moon was announced by U.S. scientists. Radar signals originated by a Defense Department satellite called Clementine indicated the presence of the ice in a large shady crater near the Moon's south pole, where the temperature is about -387 degrees F (-197 degrees C). The ice is thought to have been deposited there by a comet impact in the distant past. If it does in fact exist, the ice could be used by future human explorers as a source of both potable water and fuel. The Clementine satellite was the first U.S. Moon exploration effort since the last Apollo mission in 1972.	51-52
Lunar Exploration Efforts	Explain that as a follow-up to Clementine, the Lunar Prospector satellite was placed in orbit around the Moon in January 1998. It was equipped with a neutron spectrometer that could detect the presence of hydrogen plus nine other elements including iron, titanium, and aluminum. It did in fact detect large amounts of hydrogen at the Moon's poles, thus supporting the possibility of water there. After completing its mission in July 1999 it was intentionally crashed into a crater at the lunar south pole, to try to kick up enough material to prove the presence of water. However, scientists observing the crash site from more than twenty observatories around Earth and the Hubble Space Telescope could not detect any signs of the impact. Scientists are presently drawing up a detailed mineral map of the Moon's surface based on the data gathered by Lunar Prospector.	53-54
Lunar Exploration Efforts	In 2009 the United States launched a Lunar Reconnaissance Orbiter spacecraft into low polar orbit around the Moon, the first such American mission since the Lunar Prospector in 1998. It has a five-year mission to identify safe landing sites for possible future manned and unmanned rover missions; to make a 3-D map of the entire lunar surface with a high-resolution camera; to look once again for water ice in the polar regions; and to serve as a communications relay for any possible future expeditions to the surface.	55

Chapter 13 / Section 1: NS2-M3C13S1 –The Moon

Lunar Exploration Efforts	In September 2013 NASA launched an orbiter called the Lunar Atmosphere and Dust Environment Explorer (LADEE) on a seven-month mission to study the tenuous lunar atmosphere and dust of the lunar surface. That mission also ended with an intentional plunge into the surface.	56
Why Explore the Moon?	Explain that although spacecraft have been studying the Moon for nearly a half century, many scientific questions still remain about its origin, how it formed, what it is made of, and how it has evolved over time. Less than a quarter of its surface has been mapped in detail. Data from the Lunar Prospector mission of 1998–99 have answered some of these questions, but others will probably remain unanswered until further explorations take place.	57
Why Explore the Moon?	Explain that there are many practical reasons to explore our Moon. It is conceivable that people someday will be able to mine its mineral wealth. The Moon can also serve as a laboratory for further exploration of the solar system and the stars. It would be an ideal place to train space explorers and to provide them a base of operations for further exploration of the solar system.	58
Why Explore the Moon?	Explain that astronomical laboratories and observatories on the Moon would be unhindered by the atmosphere of Earth. They would be able to probe greater distances into space. Communications relays or missile and transportation control stations could serve in a wide variety of constructive ways. Military applications are sure to be developed also, though one hopes that the steps of humanity into outer space will be devoted to peaceful purposes.	59
Review Question	The Review Question is “Discuss the reasons and benefits for moon exploration” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	60
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	61
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	62

Chapter 13 / Section 1: NS2-M3C13S1 –The Moon

III. Supplemental Activities -

A. In class Activity:

Supplies required: CPS, Handout “Fun Quiz”,

When: This is a good activity to do after the lesson

- With the class: Quiz time! 13 fun facts about the moon.
- You can deliver this as a CPS quiz using the clickers.

Open CPS database, and expand folders until you see Module 3, chapter 13.

Place a checkmark beside the NS2-M3C13S1 In-Class Activity – Fun Quiz

* Make sure you have extra 5 points selected for the first correct answer.

Note – This quiz is also supplied as a paper quiz at the end of this lesson plan. (Next Page)

Answer Key:

<u>Question</u>	<u>Answer</u>
1	C
2	B
3	A
4	D
5	C
6	10 (+/- 1%)
7	2400 (+/- 400%)
8	B
9	A
10	B
11	C
12	3 (+/- 0%)
13	E

B. Take Home Activity: In today's lesson we learned about the moon and many of its properties. Using the Handout “The Moon”, tonight have the cadets observe the moon and make a quick sketch of what they see. Look up on the web or in a book detailing the surface of the moon and identify 5 distinct locations or geographic formations on the moon. Answer the questions: What do you think cause each of them to be formed? They can use a pair of binoculars to look at the moon to get a better view. Note: most binoculars have better optics than the first telescope used to look at the moon.

Note: depending on the phase of the moon and the weather you may need to delay or give additional time for this assignment.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 13 / Section 1: NS2-M3C13S1 –The Moon

Activity1: In Class Activity – Fun Quiz

Name: _____ Date: _____ Class: _____

1. When did the first man walk on the moon?

- A August 20, 1969
- B July 4, 1964
- C July 20, 1969
- D July 4, 1969

2. How many men have actually walked on the moon?

- A 10
- B 12
- C 14
- D 17

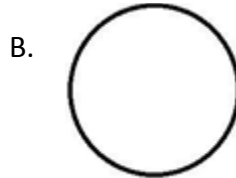
3. Does the dark side of the moon ever see sun light?

- A Yes
- B No

4. If you weighed 120 pounds on earth, how much would you weigh on the moon?

- A 120 pounds
- B 100 pounds
- C 53 pounds
- D 20 pounds

5. Which is an image of a waxing moon.



Chapter 13 / Section 1: NS2-M3C13S1 –The Moon

6. The Earth rotates at about 1,000 mph (1,609 kph), how fast does the Moon rotate?
7. Allen Sheppard took a golf club and ball to the moon with him. How far was his drive (how far did he hit the golf ball)?
8. The Moon is one of over 160 satellites orbiting the planets in our solar system. In terms of size, where does it fall in relationship to the rest of the satellites?
- A largest
 - B fifth (5th) largest
 - C eleventh (11th) largest
 - D smallest
9. It takes the Moon 29 days, 12 hours, 49 minutes, and 2 seconds to show the same phase to Earth. However, it only takes 27 days, 7 hours, 43 minutes, and 11 seconds to orbit the Earth.
- A True
 - B False
10. The second full moon in a month is called a:
- A Double Moon
 - B Blue Moon
 - C Green Moon
 - D Harvest Moon
11. Is the Moon's average orbital distance from the Earth
- A slowly getting closer
 - B stays the same
 - C slowly getting further away
- 12 How many lunar rovers (moon buggies) are on the moon?
- 13 On Friday 13 June 2014 there was a full moon, when will the next Friday the 13th full moon be?
- A March 13, 2015
 - B November 13, 2015
 - C August 13, 2021
 - D April 13, 2029
 - E August 13, 2049
 - F February 13, 2060

Chapter 13 / Section 1: NS2-M3C13S1 –The Moon

Activity 1: Take Home Activity – The Moon

Name: _____ Date: _____ Class: _____

Directions: In today's lesson we learned about the moon and many of its properties.

Tonight observe the moon and make a quick sketch of what you see. Look up on the web or in a book detailing the surface of the moon and identify 5 distinct locations or geographic formations on the moon. What do you think cause each of them to be formed? You may use a pair of binoculars to look at the moon if you have a pair to get a better view. Note: most binoculars have better optics than the first telescope used to look at the moon.

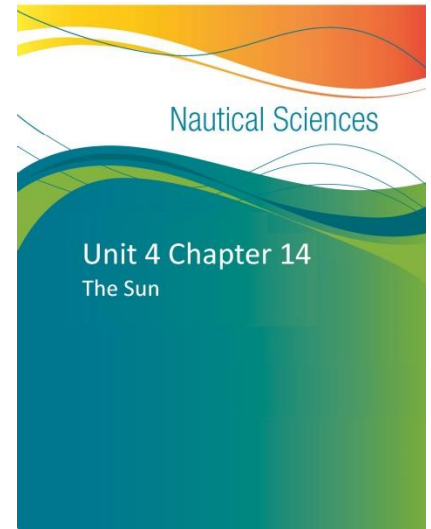
Module 3 Chapter 14: NS2-M3C14 – The Sun

What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars and planets

Skills and Knowledge to be Gained:

1. Explain the basic facts about the Sun, and its relationship to Earth
2. Describe the composition of the Sun
3. Explain sunspots and the effects they have on the Earth's atmosphere
4. Explain the effects the Sun has on the Earth's magnetic field
5. Describe the effects the Sun's energy has on the Earth
6. Explain the importance of developing solar energy systems
7. Explain the missions for further observations of the sun that has been launched in recent years



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Speaking and Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

Chapter 14 / Section 1: NS2-M3C14S1 – The Sun

(Section 1 of 1)

What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars and planets

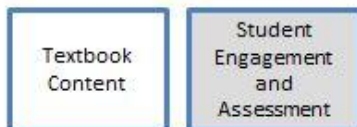
Skills and Knowledge to be Gained:

1. Explain the basic facts about the sun, and its relationship to Earth
2. Describe the composition of the sun
3. Explain sunspots and the effects they have on the Earth's atmosphere
4. Explain the effects the sun has on the Earth's magnetic field
5. Describe the effects the sun's energy has on the Earth
6. Explain the importance of developing solar energy systems
7. Explain the missions for further observations of the sun that has been launched in recent years

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 14. Place a checkmark beside the NS2-M3C14S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C14S1- Key Terms and NS2-M3C14S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 14 / Section 1: NS2-M3C14S1 – The Sun

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>We now begin discussing the sun and its relationship to the Earth. The sun is the source of most of our energy; Let's take a look at that. We will discuss some basic facts about the sun such as its size, gravity, and distance from us. We know the sun and stars are made up of the same elements we find here on Earth. We will discuss the composition of the sun, sunspots, and how activity on the sun affects the Earth's magnetic field. We will look at the importance of developing solar energy systems and talk about the space missions for further observations of the sun that have been launched in recent years.</p>	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-12
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "Describe some safe ways to observe the sun." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on the sun.	13
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	14
Introduction	Explain that Earth has been warmed by the light of the sun for 4.6 billion years. Most life is maintained by the solar energy that is converted into chemical energy by plants. Moreover, the power from all fossil fuels, water, and winds can be traced back to the sun. The sun, therefore, is the source of most of the world's energy. (The only exceptions are nuclear energy, lunar tidal energy, and the heat produced in the interior of the Earth and released by volcanoes and hot springs.)	15-18
Introduction	Explain that the sun actually contains 99.86 percent of all the matter in our solar system. An "average" star, it is considered by astronomers to be medium-sized. It is composed of luminous gases. The sun's weight is about 1 million times that of Earth. The sun's gravitational attraction is 270 times that of Earth; consequently, a 100-pound keg of nails would weigh 27,000 pounds on the Sun!	19-20

Chapter 14 / Section 1: NS2-M3C14S1 – The Sun

Introduction	Explain that the average distance from the sun to Earth (that is, Earth’s average orbital radius) has been calculated to be 92,870,000 miles—nearly 93 million. This average distance is known as an astronomical unit, a huge unit of measure often used in describing distances in outer space. The sun has a diameter of about 865,000 miles—about 109 times that of Earth.	21-22
Introduction	Explain that it is not possible for us to look directly at the sun without first protecting our eyes. Any attempt to do so will cause temporary blindness, unless some sort of filter or special fogged lens is used. The best way to see the sun is through a telescope—but only if using special precautions. Use this method: hold a piece of white cardboard a foot or so behind the eyepiece, and focus the scope until the sun’s edge appears sharp. Never look directly at the sun through a telescope or binoculars. The sun’s rays will burn the retina of your eye, causing permanently impaired vision, or even blindness.	23-25
Check on Learning Questions A (Lesson questions 3-4)	Check in on student’s understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	26
Composition of the Sun	Explain that spectrographic evidence shows that the sun consists of gases at very high temperatures. Its composition is roughly 92 percent hydrogen, 7.8 percent helium, and .2 percent other elements. Each second, about 600 million tons of this hydrogen are converted into about 596 million tons of helium by nuclear fusion, with 4 million tons being converted into energy. About 40 percent of this energy escapes in the form of visible light, with most of the rest radiated as ultraviolet light.	27-28
Composition of the Sun	Explain that even with this fantastic rate of fuel consumption, the sun is so massive that it is estimated it will take another 5 billion years or more before its supply of hydrogen is exhausted. The energy generated in the core of the sun travels outward until it reaches the three layers of the sun’s atmosphere, called the photosphere, the chromosphere, and the corona. The photosphere is about 800 km (500 mi) thick and is the layer from which the visible light of the sun originates. Next is the chromosphere, a 10,000-km (6,000-mi) thick region in which the sun’s temperature goes from about 6,000 °C at the innermost edge to about 10,000 °C at the outer edge. The outermost layer is the corona, extending many millions of miles out into space. Temperatures in the corona reach more than a million degrees Celsius.	29-33
Composition of the Sun	Explain that the moon has almost the same visible size in the sky as the photosphere of the Sun. Thus, when the moon passes between the Earth and the sun, it can partially or totally block most sunlight from reaching Earth, a phenomenon called a solar eclipse. During a total eclipse of the sun, its chromosphere—and, to a lesser extent, its corona—becomes visible to observers on Earth.	34-36
Check on Learning Questions B (Lesson questions 5-6)	Check in on student’s understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	37
Sunspots and Solar Flares	Explain that sunspots are whirling fountains of hot gas that have come out of the interior of the sun. Hotter than the surrounding gases of the photosphere, these fountains of gas rise through the chromosphere, expanding and then cooling. When cooling, they appear darker than the hotter and brighter environment behind them—thus earning the name “sunspots.”	38-39
Sunspots and Solar Flares	Explain that flares erupting from sunspots send x-rays and atomic particles called solar winds across our solar system. These can represent serious health hazards to humans aboard the International Space Station.	40

Chapter 14 / Section 1: NS2-M3C14S1 – The Sun

Sunspots and Solar Flares	Explain that solar wind erodes the lunar surface, creates comet tails, and even causes erratic changes in compass readings and the weather. It also affects the height of the ionosphere, causing fading and static in shortwave radio transmissions.	41
The Polar Auroras	Explain that it is believed that the sunspots are responsible for the beautiful and spectacular Aurora Borealis visible in the higher northern latitudes. Similar polar lights, the Aurora Australis, appear in the southern hemisphere. The energy released by collisions between nitrogen and oxygen atoms and molecules in the thermosphere, ionizes some nitrogen atoms and causes other nitrogen atoms and oxygen atoms to be excited to a higher energy level. Release of photons of light occurs; tinted green or brownish-red in the case of oxygen, blue or red in the case of nitrogen. This light creates the auroras we see.	42-43
Solar Exploration	Explain that the first satellites designed to observe the sun were Pioneers 5 -9. Launched by N.A.S.A. between 1959-1968, the Pioneers orbited the sun about the same distance as the Earth. They made the first detailed measurements of the solar wind and solar magnetic field. Other solar exploration projects included the Solar and Helio Observatory (S.O.H.O.). It was a joint project of the European Space Agency and N.A.S.A. in December 1995, and extended through 2014. It was in a heliospheric solar orbit of the gravitational pull similar to Earth's. It discovered a large number of small comets.	44-45
Solar Exploration	Explain that the Solar and Dynamics observatory (S.D.O.) was launched in February 2010 into the geosynchronous Earth orbit. It uses the Atmospheric imaging Assembly (AIA) to study the sun's magnetic field.	46
Solar Exploration	Explain that all previous spacecraft had been placed in equatorial orbits, only able to observe only that part of the sun. The Ulysses probe was launched by the space shuttle Discovery in 1990, to observe polar orbit around the sun. Its position was achieved through a slingshot gravity boost from Jupiter. Ulysses was deactivated in 2009 when it ran out of power.	47
Solar Exploration	Explain that a Solar Terrestrial Relations Observatory (S.T.E.R.E.O.) was launched in 2006, including two identical spacecraft launched to the same orbit as Earth around the Sun (one ahead and one behind). This provides stereoscopic imaging of the Sun and various solar phenomena such as comets and coronal –mass ejections.	48
Solar Exploration	Explain that an Interface Region Imaging Spectrograph (I.R.I.S.) space telescope was launched in 2006 to investigate the nature of the interface between the chromosphere and the transition region in the sun's atmosphere. Mysteries about the sun's temperature with relation to the photosphere	49
Solar Exploration	Explain that scientists have deduced from observations of the life cycles of other stars that our Sun is about halfway through its life as an average main sequence star. In about five or six billion years, it will become a red giant, increasing in size, luminosity and temperature. Earth will be become hotter than Venus is now, and the habitable zone around the sun will extend past Mars.	50
Solar Exploration	Explain that since it is unable to end its life in a supernova explosion, the Sun will spend another billion years as a red giant. After another 120 million years or so, it will continue to expand and contract until it's only half its current mass with its core exposed. Finally it will contract, cool and become a dense Earth-sized white dwarf before eventually fading to black.	51

Chapter 14 / Section 1: NS2-M3C14S1 – The Sun

Review Question	The Review Question is, “Why is an understanding of the nature and characteristics of the sun so important to astronomers and meteorologists?” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	52
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	53
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	54

III. Supplemental Activities -

A. In class Activity:

Supplies required: Shoe box, a small piece of aluminum foil, some tape, white paper, and a knife.

When: This is a good activity to do after the lesson is taught

With the class: Display the S.O.H.O. current image of the sun displaying any sun spots. Now you are going to track it and even sketch it (if it is big enough to see) over the next couple of days.

<http://soho.esac.esa.int/sunspots/>

Build a pinhole camera. Never ever look at the sun directly or through an unapproved solar filter at the sun. Immediate and permanent damage to your eye can happen. Blindness can happen in an instant.

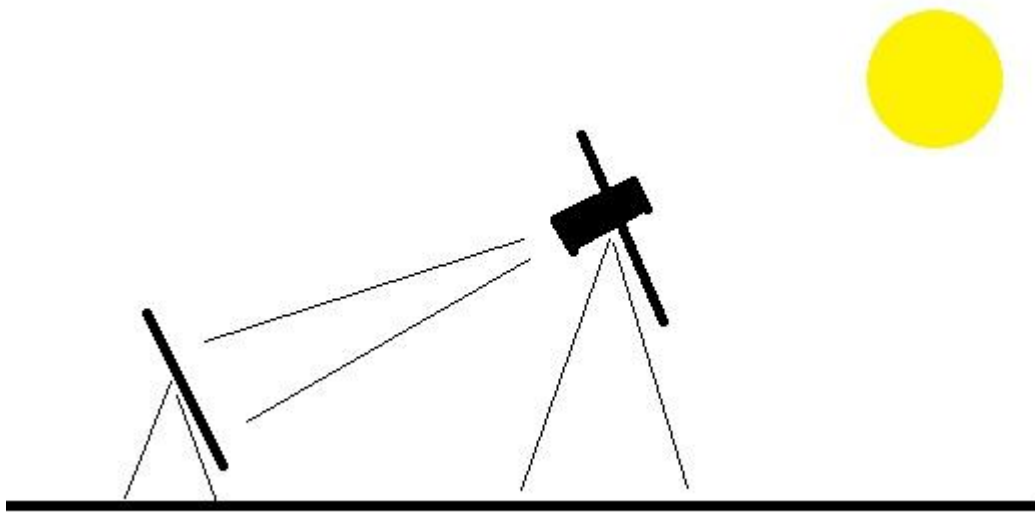
On one end of the shoe box cut about a 1 inch by one inch hole. Tape a piece of aluminum foil over the hole and poke a small pin hole in it. On the other end of the box tape a piece of white paper to the inside end to project the image of the sun onto. For best results cut about 4 inches off the box lid so that it covers most of the box, but allows you to see the white paper that will have the image of the sun on it.

Students, can you see any sun spots? If the whole was square instead of round, would the image look square instead of round? (No it is a projection of the sun which is round). This is the method that early astronomers first looked at the sun. If you were in a dark room and had a pinhole in a wall, would you see a larger image on the opposite wall or floor of the room? Yes, the further away the image from the hole the larger, but dimmer it will be.

For the instructor: *Build a magnified solar projector.*

With a larger piece of cardboard cutout two holes so that you may place the binocular lenses through the cardboard. Tape the cardboard to the binoculars and tape closed any openings around the lens so no light will pass through. This will work best if you have a camera stand or some way to hold the binoculars in place without them jiggling.

Chapter 14 / Section 1: NS2-M3C14S1 – The Sun



B. Take Home Activity: Now that you have built a pinhole camera and can see sun spots, track the sun spot activity for a week. Sketch what you see each day and watch how the spots change and move.

IV. Evaluation - see CPS database for chapter test questions.

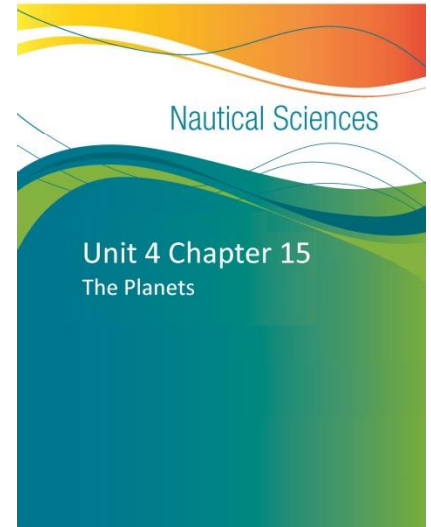
Module 3 Chapter 15: NS2-M3C15 – The Planets

What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars and planets

Skills and Knowledge to be Gained:

1. Describe the solar system in which we live
2. Identify the major characteristics of the planet Mercury
3. Describe special features of Venus as it related to our solar system
4. Describe the major features of Mars
5. Identify the principal characteristics of Jupiter
6. Describe the prime features of Saturn and explain how it differs from other planets in our solar system
7. Describe the chief characteristics of Uranus
8. Describe the relationship of Neptune and Uranus
9. Identify the unique features of Pluto
10. Describe the Nice Theory of Early Planetary Migration



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Writing

- W.9-10.1. Write arguments to support claims in an analysis of substantive topics or texts...
- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...

Module 3 Chapter 15: NS2-M3C15 – The Planets

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 4. Communicating Conclusions and Taking Informed Action

- D4.1.9-12. Construct arguments using precise and knowledgeable claims, with evidence from multiple sources...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 15 / Section 1: NS2-M3C15S1 – Planets Overview, Mercury & Venus

(Section 1 of 3)

What Cadets Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars and planets

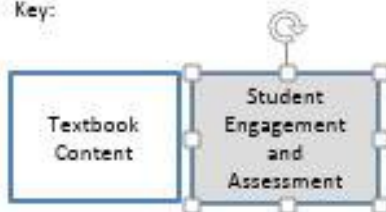
Skills and Knowledge to be Gained:

1. Describe the solar system in which we live
2. Identify the major characteristics of the planet Mercury
3. Describe special features of Venus as it related to our solar system

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Introduction	Video Introduction to the Planets	Traditional and Dwarf Planets (A)	Check On Learning A
Traditional and Dwarf Planets (B)	Check on Learning B	Mercury (A)	Video 1 Mercury	Mercury (B)	Video 2 Mercury	Venus (A)	Video 1 Venus
Venus (B)	Video 2 Venus	Venus (C)	Video 3 Venus	Venus (D)	Review Questions	Closing Questions	Call for Other Questions

Key:



Chapter 15 / Section 1: NS2-M3C15S1 – Planets Overview, Mercury & Venus

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 15. Place a checkmark beside the NS2-M3C15S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C15S1- Key Terms and NS2-M3C15S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	Motivate cadets by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons. In this lesson we will look at special features and characteristics of each planet and discuss their similarities and differences.	1-3
Key terms - CPS	Ask cadets to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-8
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Name the eight traditional, or “classical,” planets in order from the Sun.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the cadets to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the cadets’ responses to the question on the slide, focusing on an introduction to the planets.	9
Introduction	Explain that up until 2006, there were nine traditional known planets in our solar system, plus several recently discovered and as yet unnamed possible additional ones in the Kuiper comet belt in the outer reaches of the solar system. In order outward from the sun, they are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto.	10
Introduction	Explain that in 2006, the International Astronomical Union (I.A.U.) defined a planet as having to satisfy all 3 criteria: <ol style="list-style-type: none">1. A planet is a body that orbits the sun2. Is massive enough for its own gravity to make it round3. “Cleared its neighborhood” of smaller objects around its orbit Under this definition, Pluto and the newly discovered bodies of comparable size beyond Pluto were not planets since they did not satisfy the third criterion. They were reclassified into a new category called dwarf planets.	11-12

Chapter 15 / Section 1: NS2-M3C15S1 – Planets Overview, Mercury & Venus

Video on an Introduction to the Planets	Show video on an introduction to the planets	13
Traditional and Dwarf Planets	Explain that under the new definition there are now considered to be eight traditional or “classical” planets in our solar system, plus Pluto and four other dwarf planets in its outer regions.	14
Traditional and Dwarf Planets	Explain that the eight traditional planets in order from closest to furthest from the sun consist of: <ol style="list-style-type: none"> 1. Mercury 2. Venus 3. Earth 4. Mars 5. Jupiter 6. Saturn 7. Uranus 8. Neptune 	15-16
Traditional and Dwarf Planets	Explain that Mercury scorches under the intense rays of the sun. Venus and Mars have some similarities to Earth. Jupiter, Saturn, and Neptune are strange, cold, and composed of poisonous gases and chemical compounds uncommon on Earth.	17
Traditional and Dwarf Planets	Explain that the dwarf planets are small, cold, rocky bodies with tenuous if any atmospheres. They are so far away and dimly lit that they can only be observed by very powerful telescopes.	18-19
Traditional and Dwarf Planets	Explain that the planets are wanderers in the sky; the word “planet” actually means “wanderer.” They are called that because they are constantly moving about the sun in their orbits. Since they are moving, it is difficult to keep track of them without some sort of chart. A chart that serves as a timetable for the movement and location of the planets is called an almanac or an ephemeris.	20-21
Traditional and Dwarf Planets	Explain that the planets all orbit the sun in the same direction and generally in the same plane. Earth’s orbit about the sun, called the plane of the ecliptic, is the usual reference to which all the other orbital planes are compared.	22
Check on Learning Questions A (Lesson questions 3-4)	Check in on student’s understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	23
Traditional and Dwarf Planets	Explain that the traditional and dwarf planets’ plane of ecliptic range from 0 to 17.2 degrees. The Earth’s average orbital radius is 93,000,000 miles and is called an astronomical unit.	24-25
Traditional and Dwarf Planets	Explain that the planets’ orbits around the sun are each in the shape of an ellipse (an egg shape), the Sun is at the center, and each planet’s orbit falls into its own groove outward from the center.	26
Traditional and Dwarf Planets	Explain that although planets are much smaller than stars, they are also much closer to us, so that a telescope can magnify them. Five planets can be seen without a telescope: Mercury, Venus, Mars, Jupiter, and Saturn. Uranus is just at the limit of visibility, and Neptune, Pluto, and the new tenth planet can be seen only with powerful telescopes	27-28
Traditional and Dwarf Planets	Explain that the planets Venus, Mars, Jupiter, and Saturn are sometimes called the “Big Four” because they are so easily visible. Since its orbit is nearer the sun than the	29-30

Chapter 15 / Section 1: NS2-M3C15S1 – Planets Overview, Mercury & Venus

	<p>Earth's orbit, and it is always near the sun as we look at it, Venus can only be seen in the western sky just after sunset or in the eastern sky before sunrise. It is thus called the evening star or morning star. Mars, Jupiter, and Saturn have orbits that lie outside that of Earth, so they can be seen all night. The Big Four are brighter than any of the stars and do not twinkle like stars do. Because of their relative nearness, they appear as discs instead of points of light. The planets, like our moon, shine only by reflected sunlight.</p>	
Traditional and Dwarf Planets	<p>Explain that each planet is measured in distance from the sun in astronomical units. The distance of each planet from the sun are:</p> <ul style="list-style-type: none"> • Mercury Earth – .387 • Venus Earth – .723 • Earth – 1.000 • Mars – 1.524 • Jupiter – 5.203 • Saturn – 9.539 • Uranus - 19.180 • Neptune - 30.060 • Pluto - 39.440 	31-32
Traditional and Dwarf Planets	<p>Explain that each planet's diameter in miles and temperature in degrees Celsius are:</p> <ul style="list-style-type: none"> • Mercury Earth – 3,000 179 degrees • Venus Earth – 7,526 482 degree • Earth – 7,918 15 degrees • Mars – 4,200 - 63 degrees • Jupiter – 85,500 - 121 degrees • Saturn – 71,400 - 125 degrees • Uranus – 29,850 - 193 degrees • Neptune – 31,250 - 173 degrees • Pluto – 1,430 - 230 degrees 	33-34
Traditional and Dwarf Planets	<p>Explain each planet has a different number of moons and orbital period (time that it takes the planet to go around the sun) which are:</p> <ul style="list-style-type: none"> • Mercury Earth – 0 moons / 88 days • Venus Earth – 0 moons / 255 days • Earth – 1 moon / 365 days • Mars – 2 moons / 687 days • Jupiter – 61 moons / 12 years • Saturn – 31 moons / 29 years • Uranus – 27 moons / 84 years • Neptune – 13 moons / 165 years • Pluto – 3 moons / 249 years 	35-36
Traditional and Dwarf Planets	<p>Explain that sometimes the planets, as seen from Earth, seem to go backward in their orbits—that is, east to west. This backing up, or retrograde motion, is easily explained. The best example of observable retrograde motion is with the planet Mars. Mars travels slower than Earth does, since it is farther from the sun</p>	37
Traditional and Dwarf Planets	<p>Explain that all the planets except Mercury and Venus have satellite moons. All of the other planets, except Earth, have two or more. Jupiter has a total of 61 known moons. The 4 largest moons are: Io, Europa, Ganymede, and Callisto. Uranus has 27 moons, Saturn 31, and Neptune 13.</p>	38-39

Chapter 15 / Section 1: NS2-M3C15S1 – Planets Overview, Mercury & Venus

Traditional and Dwarf Planets	Explain that Galileo discovered four of Jupiter's moons in 1610. Many of the outer planets' moons were discovered and photographed by the Pioneer and Voyager spacecraft in the 1980's. Some of these were also observed by the Hubble Space Telescope as well as by several of the larger terrestrial telescopes.	40-42
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	43
Mercury	Explain that Mercury is the smallest of the inner planets in the solar system. Its temperature is so high on the sunny side that it has no atmosphere.	44
Video 1 on Mercury	Show video 1 on Mercury.	45
Mercury	Explain that the temperature is 800 degrees F on the lighted side and -300 degrees F on the dark side. Since there is no atmosphere, there is no erosion.	46
Mercury	Explain that TV cameras mounted on the Mariner 10 spacecraft observed Mercury in 1974 and 1975. It has a heavily cratered, dusty surface like that of the moon and a large core of iron somewhat like Earth's. Mercury has a series of cliffs, some extending up to 2 miles high, which cut across the surface for hundreds of miles. They probably formed about 4 billion years ago when cooling of the planet's core crumpled the crust.	47-48
Video 2 on Mercury	Show video 2 on Mercury.	49
Mercury	Explain that Mercury was named for the speedy messenger of the gods in Greek mythology. It has the shortest period of revolution about the sun—88 days. Because it is so close to the sun, the planet is difficult to observe. It is best seen just after sunset in March and April and just before sunrise in September and October.	50
Venus	Explain that it was once believed that Venus was almost a twin sister of Earth, because the two planets are so nearly alike in size, mass, and density. Astronomers of the seventeenth and eighteenth centuries believed Venus to be very warm, but with plentiful water and lush vegetation, and probably peopled by small, dark-skinned people.	51
Video 1 on Venus	Show video 1 on Venus	52
Venus	Explain that since 1962, about twenty Soviet and U.S. spacecraft have explored Venus. Several of a series of Soviet Venera landers launched from the late 1960's to the early 1980's successfully penetrated the Venusian atmosphere and reported its density and pressures before landing on the surface. They recorded surface temperatures of 900 degrees F and returned pictures of a barren, lunarlike landscape. These observations, plus others by American spacecraft, have shown that the planet is a very unlikely place for life of any kind.	53-54
Venus	Explain that there is no water and no free oxygen on Venus. The atmosphere is even less friendly. A deep layer of carbon dioxide, 100 times heavier than Earth's atmosphere, would bear down on an inhabitant with the weight of the ocean at a depth of 3,300 feet. The great heat on Venus is caused by what is commonly called the "greenhouse effect."	55
Venus	Explain that the thick cloud cover makes it nearly impossible to observe any surface features. However, the areas in which the Soviet Venera spacecraft landed appeared to be composed of loosely packed granite.	56

Chapter 15 / Section 1: NS2-M3C15S1 – Planets Overview, Mercury & Venus

Video 2 on Venus	Show video 2 on Venus	57
Venus	Explain that Earth turns once on its axis every day, but Venus turns only once in 243 Earth days. Because of its orbit around the sun, a solar day on Venus is 117 days from one sunrise to the next, but because of the super-refractivity (extreme bending of light rays by the ultra-dense atmosphere), no one on the Venusian surface could tell the difference. Unlike most planets, Venus spins clockwise, opposite to its orbit around the Sun.	58
Venus	Explain that photographed by Mariner 10 on its way to Mercury, and Pioneer 12, as well as by cameras aboard the Galileo spacecraft on its way to Jupiter in 1991, the clouds above Venus race at more than 200 miles per hour from east to west. These clouds lie up to 40 miles above the huge, shallow craters that have been detected on the surface. Above the clouds, a haze extends another 15 miles. Findings sent back so far do not reveal the composition of the inner cloud layers. The tops, however, seem to consist mainly of fine sulfuric-acid droplets—a mist that is thought to be more corrosive than automobile-battery acid.	59-60
Venus	Explain that while the missions to Venus were certainly important, all the data they accumulated was dwarfed by the Magellan spacecraft, the last U.S. space probe to visit the planet. Launched in 1989, it reached Venus in 1991 and began an extended radar survey of the planet in strips 10 to 17 miles wide. This effort enabled scientists to view details the size of a football field in razor-sharp detail.	61
Video 3 on Venus	Show video 3 on Venus	62
Venus	Explain that the Magellan showed that the surface was full of enormous lava flows, unexpected pancake-like structures, and large impact craters up to 120 miles in diameter. Magellan's radar maps showed no signs of past major water bodies such as shorelines or ocean basins. Unlike Earth, there is no evidence of plate tectonics (movements of crustal mass), which may indicate it lacks an asthenosphere between its crust and mantle. The distribution of volcanoes is also interesting. On Venus hundreds of thousands, perhaps millions, of them appear to be randomly distributed around its surface, rather than distributed in groups such as in the "Ring of Fire" around Earth's Pacific Rim.	63-64
Venus	Explain that with its power supplies nearly depleted, Magellan's mission ended with a dramatic plunge into the Venusian atmosphere in October 1994, the first time an operating planetary spacecraft was intentionally destroyed. The purpose of the maneuver was to gather data on Venus's atmosphere before Magellan ceased to function.	65
Venus	Explain that Venus, named for the Roman goddess of beauty, is in fact a grim and lifeless inferno hidden behind its clouds. But to us on Earth, Venus is often the brightest object in the sky, besides the moon and sun. Venus shines most brightly when it is between us and the sun, even though the sunlight falls on the side away from us, for the planet is closest to us at that time.	66
Review Question	The Review Question is, "List the three criteria necessary for a celestial body to be classified as a planet." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the cadets' best responses for visual reinforcement, and to foster discussion.	67

Chapter 15 / Section 1: NS2-M3C15S1 – Planets Overview, Mercury & Venus

Closing Questions(Lesson Questions 7 - 8)	Have cadets respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	68
Call for Other Questions	Provide the opportunity for cadets to ask final questions regarding the content covered.	69

III. Supplemental Activities -

A. In Class Activity: Solar system idea concept map

Supplies required: chart paper

(If you have not done the planet walk activity from Chapter 12, it can be very useful for this chapter. If you have done the walk it is recommended to review the distances for Mercury and Venus for this lesson)

When: This is a good activity to do before you start this lesson.

- Have the cadets divide into pair groups. Now have them develop a concept map of what they already know about the solar system. They should include concepts of distance, composition of the object, temperatures, size, do they have moons or other objects orbiting them, and have we sent space craft to look at them.

(They should continue to update their concept map through all three sections of this module)

- With the class: Can you divide the information on your concept chart into distinct characteristics? How about do some object fall into one area and have similar characteristics, while others seem to be grouped separately? What objects are visible from earth without a telescope? Are there objects that you think the United States should try to have a manned mission to, why?

A. In Class Secondary Activity: Inner planet orbits

Supplies required: flash light and string - and clear out the center of your room or have a large open area.

- Select 4 cadets for this simulation, the rest of the class get to help.
In the middle of the room have the student who is the sun hold the flash light. Now have the cadets make three circles around the sun with the string. Each circle has a center on the sun and is bigger than the next one closer to the "sun". The cadets are making the orbital paths of Mercury, Venus, and Earth. (These do not have to be to scale for this simulation to work).
- Now have the three cadets acting as the planets chose any place on their respective orbits. The sun should aim the flash light at Earth at all times.
 - What direction does the cadet representing the Earth need to be facing so that the light from the sun is low enough that you can see either Venus or Mercury? (This represents sunset and sunrise.) In which direction should you

Chapter 15 / Section 1: NS2-M3C15S1 – Planets Overview, Mercury & Venus

be turning if you were the Earth? So where are Mercury and Venus compared to the sun? (Low on the horizon?)

- What direction would the cadet representing the Earth need to be facing if it was the middle of the night? Can you see either of the two planets now?
- Have the class move the planets around on their orbits, does it matter where they are? When is neither planet visible - at either sunrise or sunset? (When they are behind the sun.)
- Can you see Venus in the middle of the day? Absolutely YES! Venus is so bright that if you know where to look, you can see it. If you find it with a pair of binoculars you may even be able to tell what phase it is in. Remember, because it has an orbit inside Earth's orbit, it will have phases just like our Moon does. To find it, you need to look to the appropriate side of the Sun, roughly the distance of 3 times the width of your fist when held outstretched in front of you. You will have to research which side to look based upon when you are conducting this experiment.

B. Take Home Activity: Depending on when you do this, it is either the morning challenge or the evening challenge. Now that the cadets understand where and why they will see Venus or Mercury in the morning or evening, challenge them to spot it first. Most cadets have cell phones which are now generally synchronized by the cell phone system so they all match. A watch or clock will work as well. Have the cadets report what time they spotted the designated planet, where it was on the horizon, and what direction it was. For the direction have the cadets use a magnetic compass or they can calculate it using a map and a reference point. Additionally, how high was it in the sky when you saw it? Have the cadets report back the next day with their findings.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 15 / Section 2: NS2-M3C15S2 – Mars & Jupiter

(Section 2 of 3)

What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars and planets

Skills and Knowledge to be Gained:

1. Describe the major features of Mars
2. Identify the principal characteristics of Jupiter

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Mars (A)	Video 1 Mars	Mars (B)	Check On Learning A
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Mars (C)	Video 1 Jupiter	Jupiter (A)	Check on Learning B	Jupiter (B)	Video 2 Jupiter	Jupiter (C)	Video 3 Jupiter
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Jupiter (D)	Review Questions	Closing Questions	Call for Other Questions
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Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 15. Place a checkmark beside the NS2-M3C15S2 PowerPoint presentation, and these two CPS question deck files: NS2-M3C15S2 - Key Terms and NS2-M3C15S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 15 / Section 2: NS2-M3C15S2 – Mars & Jupiter

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons. In this lesson we will look at special features and characteristics of each planet and discuss their similarities and differences.	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-6
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Discuss what types of exploration missions have occurred on Mars.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on Mars and Jupiter.	7
Mars	Explain that of all the planets in our solar system, Mars, the fourth from the sun and the next one beyond Earth, has aroused the greatest interest.	8
Video 1 on Mars	Show video 1 on Mars.	9
Mars	Named after the Roman god of war, it is often called the “red planet.” It is not as easily recognized as Venus or Jupiter because it is not as bright.	10
Mars	Explain that Mars’ red color and its rapid movement from west to east among the stars make it stand out in the sky. The best time for viewing Mars is when it is nearest to Earth in August and September. In those months it sometimes comes as close as 30 million miles. In February and March it is over 60 million miles away and much less easily viewed. It is best seen when in direct opposition—in other words, when Earth is directly between the sun and Mars.	11
Mars	Explain that many scientists of the past thought Mars was capable of supporting some kind of life. The Italian astronomer Giovanni Schiaparelli announced that he had observed a series of intersecting lines on the Martian surface in 1877. He called them canali, Italian for “channels” or “canals.” Many people believed that the canali must have been made by intelligent beings because they were so straight. They thought that perhaps they were created by free-flowing water, indicating that Mars could be capable of supporting life. But subsequent observations and extensive photography from the Mariner and Viking series of space probes definitively proved the canali to be an illusion.	12-14

Chapter 15 / Section 2: NS2-M3C15S2 – Mars & Jupiter

Mars	Explain that in 1969 and 1970 Mariner 6 and Mariner 7 made six-month-long journeys to photograph Mars, looking specifically for life on the planet. They found no sign of living things or an environment that could support them. The landscape appeared barren, and there was no evidence of water.	15
Mars	Explain that Mariner 9, by extensive photography of the Martian surface, revealed that large amounts of water must have once washed over the planet to form great canyons, meandering hundreds of miles across the surface. Today, however, Mars has a grim, lunar like landscape, pockmarked with craters. Variations in the planet's orbit around the sun occur on a 50,000-year cycle.	16
Mars	Explain that the Martian atmosphere contains small amounts of oxygen and water vapor, but not enough to sustain life as we know it on Earth. It is mostly carbon dioxide and only about 1 percent as dense as Earth's—about the same as our atmosphere 20 miles up. Thin white clouds occasionally appear in the Martian atmosphere and a veil of haze rises above each polar region during the winter seasons. The polar regions grow and shrink during the winters, which appear to be similar to Earth seasons. The Martian polar ice is thought to be composed of frozen carbon dioxide and frozen water vapor.	17-18
Mars	Explain that fierce seasonal Martian winds whip up huge dust storms of the pinkish-colored iron oxide that covers about three-fourths of the Martian surface. The windstorms may rage for months, at speeds of up to 300 miles per hour, covering much of the planet with swirling reddish and yellowish dust clouds. The dust of Mars is extremely fine, something like fine talcum powder. This dust sometimes is carried 35 miles above the planet's surface.	19-20
Mars	Explain that huge inactive volcanoes are present on the Martian surface. Nix Olympica (Snow of Olympus) is the size of the state of Nebraska. It rises 15 miles above the surrounding terrain and has a main crater 40 miles in diameter. A volcano named South Spot has the largest volcanic crater on Mars, measuring 75 miles across.	21
Mars	Explain that temperatures on Mars range from near 32 degrees F in summer in the early afternoon to -135 degrees F just before sunrise. The surfaces of the darker areas may be 40 degrees warmer due to absorption of the sun's rays. Because of the thin atmosphere, the air a few feet above the ground may be as much as 80 degrees cooler than the surface itself. The daily temperature range of about 170 degrees would be extremely uncomfortable, if not fatal, to Earth's higher organisms. The polar regions seem to have fairly constant temperatures of about -190 degrees F.	22
Mars	Explain that Mars is about twice the diameter of the Moon and about half that of Earth. While Earth has a surface area of 197 million square miles, Mars is only about one-quarter that size, 55½ million square miles. Mars' gravity is only about one-third (0.38) of Earth's. That means a person weighing 150 pounds on Earth would weigh only about 57 pounds on Mars.	23
Mars	Explain that two N.A.S.A. Viking spacecraft landed safely on Mars in 1976. Carrying cameras, sensors, and radio-controlled arms, one Viking retrieved and analyzed samples of Martian soil and rocks in a series of on-board chemical tests. The analyses were sent back to Earth. In what has been the most detailed search for life on Mars so far, the results were generally considered inconclusive. Interestingly, one of the many pictures sent back from the Viking orbiter contained an eerie image of what seemed to some to be a human face carved out of a hill. It has appeared periodically in many tabloid newspapers ever since.	24

Chapter 15 / Section 2: NS2-M3C15S2 – Mars & Jupiter

Mars	Explain that in 1996, N.A.S.A. scientists reported that they had discovered fossilized evidence of ancient Martian bacteria in an Antarctic meteorite determined to have originated on Mars some 3 billion years ago. Their findings were based on chemical, mineral, and structural evidence found in the interior of the meteorite. The discovery was immediately hailed as one of the most important in the last century by many scientists interested in the possibility of extraterrestrial life. Later, other scientists disputed these claims, stating that the alleged “bacteria” were in fact a product of chemical reactions.	25-26
Mars	Explain that the Mars Pathfinder was launched in December 1996. It made a cushioned landing on the Martian surface on the Fourth of July, 1997. It carried the Sojourner.	27
Check on Learning Questions A (Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	28
Mars	Explain the Sojourner was a small 22-pound solar-powered, wheeled rover called Sojourner. It was designed to roam around the landing area to collect and send back information obtained through black-and-white and color photographs taken by cameras on its base platform, and by a spectrometer carried on board. For the next two months Pathfinder returned many high-quality images of the planet and other scientific data.	29-30
Mars	Explain that even more successful than Pathfinder were two larger and more capable rovers sent to Mars in the midsummer of 2003. One of these, called <i>Spirit</i> , landed in January 2004, in a rocky outcrop called Gusev Crater, and the other, <i>Opportunity</i> , landed three weeks later on the opposite side of Mars in a sandy area called the Meridiani plains. Although their missions were originally planned to last three months, both were still operational much later. Ultimately, <i>Spirit</i> found more evidence of igneous rocks extensively altered by ancient exposure to water, and <i>Opportunity</i> found layered bedrock at its location bearing geological evidence of an ancient body of shallow water. Both sent back hundreds of detailed photographs, many showing their tracks through the Martian terrain.	31-34
Mars	Explain that additional missions to Mars have been planned for the next several years, including several more orbiters and large rovers, a lander equipped with a robotic arm for digging deep into the northern plains area in search of signs of life, and by 2014, a lander able to return samples of Martian rock and soil to Earth. A mission sending astronauts to Mars may be a possibility sometime thereafter. Ultimately all these explorations may one day resolve the many questions about water on Mars and the possibility of former or current life on the planet.	35
Video 1 on Jupiter	Show video 1 on Jupiter.	36
Jupiter	Explain that Jupiter is the fifth planet from the sun. Larger than all the other planets put together, its diameter is more than ten times that of Earth. It orbits about 484 million miles from the sun and never comes closer to Earth than 367 million miles. Despite its great distance, it usually outshines everything in the night sky except the Moon and Venus.	37-38
Jupiter	Explain that Jupiter, named after the king of the Roman gods, remained an almost complete mystery until N.A.S.A.’s <i>Pioneer 10</i> passed within 82,000 miles of its cloud tops in December 1973. <i>Pioneer 11</i> moved to within 27,000 miles a year later to find out more.	39-40

Chapter 15 / Section 2: NS2-M3C15S2 – Mars & Jupiter

Jupiter	Explain that two U.S. Voyager spacecraft with more advanced instruments flew by Jupiter and several of its moons in March and July 1979. Many superb color pictures of the planet and its four major moons, Io, Europa, Callisto, and Ganymede, were transmitted back to Earth. Several spectacular new discoveries were made, including sulfur and sulfur dioxide vulcanism on Io and water ice on Callisto and Ganymede.	41-43
Jupiter	Explain that Jupiter can easily retain all kinds of gases in its atmosphere, especially hydrogen and helium. The whirling planet rotates so swiftly that a day is only ten hours long. The force of Jupiter's gravity is such that a 150-pound man would weigh 350 pounds at the equator and 425 pounds at either pole.	44
Jupiter	Explain that travel to Jupiter by astronauts is beyond the most advanced space technology today. The twenty-one-month trip itself would be beyond the capability of present life-support systems. Also, communications would have a forty-five-minute lag because of the distance to it. Temperatures above the planet's cloud layer are about -200 degrees F, and much higher temperatures, possibly in the thousands of degrees, exist closer in. The chief peril comes from Jupiter's radiation belts. Lethal doses of radiation, a thousand times more than a human being could stand, were sustained by Pioneer 10 for several hours prior to its point of closest approach. It seems possible that Jupiter is surrounded by radiation belts similar to Earth's Van Allen belts.	45-46
Jupiter	Explain that the atmosphere of Jupiter is made up mostly of hydrogen and helium. There also are small but extremely important amounts of methane, ammonia, and water. Wide, circling bands of white, yellow, brown, and gray make up much of Jupiter's face. Inside these belts of clouds there is much turbulence, and jet streams race through the area. Farther in, after an area of relatively clear atmosphere, there is a darker cloud deck. It consists of dark yellow, orange, and brown clouds, composed mainly of icy particles of ammonium hydrosulfide. The innermost layer of clouds is a massive, thick band of liquid-water droplets suspended in the hydrogen-helium atmosphere, with ice-crystalline, cirrus-like clouds on top.	47-49
Jupiter	Explain that beneath this deep cloud deck, about 125 miles below the tops of the outermost cloud layer, pressures approach 100 times that of Earth's atmospheric pressure at sea level (14.6 pounds per square inch). The temperature can reach 800 degrees F here. We do not yet know for sure what is within the cloud layers. But according to current theory, there is no solid surface as on the other planets. Instead, the hydrogen is gradually squeezed into a dense, hot fluid under increasing pressure. Finally, about 1,800 miles down, a crushing gravitational force (equal to 100,000 Earth atmospheres) and temperatures of 12,000 degrees F change the hydrogen and helium into a substance so dense that it behaves like a liquid. Some 12,000 miles down, under a pressure of 3 to 5 million "atmospheres" and at a temperature of 18,000 degrees F, the hydrogen becomes a metal, in a form unknown on Earth. It is not yet known whether or not Jupiter has any core, but if so, it may be composed of iron and other heavy elements.	50-51
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	52

Chapter 15 / Section 2: NS2-M3C15S2 – Mars & Jupiter

Jupiter	Explain that while Jupiter's atmosphere is kept constantly churning by its interior heat, one feature of the planet remains almost unchanged. That is the mysterious Red Spot in the southern hemisphere. The Red Spot is some 17,000 miles long by 8,500 miles wide. It drifts slowly around the planet, staying generally in the same latitude. Its color sometimes fades to a gray and then returns to its red-orange state. Some scientists think the Red Spot is a long-lived storm that will eventually disappear. Others think that it is a concentration of methane, ammonia, and hydrogen—the characteristic gases of Earth's earliest atmosphere.	53-55
Jupiter	Explain that in October 1989, the Galileo spacecraft was launched from the space shuttle Atlantis with a dual mission to launch an exploratory probe into the Jovian atmosphere and to orbit the planet for at least two years in order to conduct an extensive survey of the planet and its four major moons, called the Galilean satellites in honor of their discoverer.	56
Video 2 on Jupiter	Show video 2 on Jupiter.	57
Jupiter	Explain that while on its way, the Galileo spacecraft passed near the asteroid belt, close enough to get detailed pictures of two asteroids, and discover a small moon orbiting around one of them.	58
Video 3 on Jupiter	Show video 3 on Jupiter.	59
Jupiter	Explain that in July 1994, another spectacular series of pictures was made of the impact on Jupiter of fragments of comet Shoemaker-Levy. The Hubble Space Telescope and probes <i>Ulysses</i> and <i>Voyager 2</i> also took photos of fragments striking Jupiter at 130,000 miles per hour. Huge fireballs and plumes of dust and gas were observed, followed by black and brown discolorations, some of which were as large as planet Earth.	60-61
Jupiter	Explain that Galileo entered orbit around Jupiter in December 1995, the same day as its probe released months earlier slammed into the Jovian atmosphere at a speed of about 106,000 miles per hour (47 kilometers per second). The probe incorporated experiments to measure temperature and pressure along the descent path, located major cloud decks, and analyzed the chemistry of atmospheric gases.	62
Jupiter	Explain that the probe also attempted to detect and study Jovian lightning both by looking for optical flashes and by listening for the radio static they generate. It traveled to between 130 and 160 kilometers below Jupiter's cloud tops before the extreme atmospheric pressure there rendered it inoperable. New discoveries also included Doppler Wind Experiment and Helium: A Tracer for Planetary Evolution. During the Doppler Wind Experiment, Jovian wind speeds in excess of 400 mph were recorded. However, there was far less lightning and activity than anticipated. It was also discovered that there was a helium abundance very near that of the sun.	63-66
Jupiter	Explain that although Galileo's mission was originally planned to last only two years, it ultimately explored Jupiter and its moons for a total of eight years until it was sent on a final plunge into the Jovian atmosphere in September 2003. Many new discoveries about Jupiter and its moons were made by Galileo and its probe including extensive resurfacing of the moon Io due to continued volcanic activity. Particularly intriguing was the discovery that liquid water probably exists beneath the moon Europa's icy surface. The moon appears to be covered by a layer of ice about 12 miles thick over most of its surface, and calculations based on Galileo's data indicate there may be a 65-mile deep ocean beneath the ice, kept in liquid form by energy from the gravitational pulls of the planet plus its other moons.	67-68

Chapter 15 / Section 2: NS2-M3C15S2 – Mars & Jupiter

Jupiter	Explain that if Europa does indeed have liquid water, it would be the first place other than Earth in the solar system known to have it. This possibility has excited scientists and led to planning follow-on missions that include another planetary orbiter called Juno to be launched sometime before 2010, and a possible mission to send a submarine probe to Europa to burrow through the ice and look for life underneath.	69-70
Review Question	The Review Question is, “Describe and discuss Jupiter’s structure, atmosphere, and temperature.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	71
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	72
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	73

III. Supplemental Activities -

A. In Class Activity: Life, is there life in our solar system besides here on Earth?

Supplies required: None

When: This is a good activity to do after the lesson

*Note - The planet walk is recommended if you have not conducted it from Chapter 12. If you have conducted the planet walk, it is worth a quick review of the distances for mars and Jupiter.

- With the class: Debate time. Divide the class into 2 groups. If the class naturally is divided between those that believe life could exist in other places other than Earth with those that do not, perfect. Otherwise, evenly divide the class into the pros and cons of the concept.
- We have talked about finding the building blocks of life in several places today other than on Earth. You will have five minutes to develop your position as a group. Each group will have the opportunity to present their argument for their side of the discussion. To ensure everyone is participating let the class know that you will be having the CPS system select an individual from each group to make the final closing argument for each team.

B. Take Home Activity: If Jupiter is visible in the night sky. Observation time again. Today we talked about the largest planet in our solar system, Jupiter. Even though it is over 367 million miles from Earth at its closest point, on the planet walk that was over a city block away, it is one of the most visible planets in the night sky. Early astronomers were able to see its 4 major moons and the great red spot was discovered. You can even make out that it has moons without any magnification when the moons are all visible, not behind or in front of Jupiter. With a pair of binoculars you will be able to see the weather patterns, maybe even the great red spot and the 4 moons. Sketch what you see and be prepared to tell the class what you observed.

Chapter 15 / Section 2: NS2-M3C15S2 – Mars & Jupiter

B. Alternative Take Home Activity: We talked about the comet Shoemaker-Levy today and how it impacted Jupiter. Write a 1 page essay on what caused the comet to originally break apart, and then crash into Jupiter. What do you think the possible effects would have been if the comet had hit Earth instead?

IV. Evaluation - see CPS database for chapter test questions.

Chapter 15 / Section 3: NS2-M3C15S3 – Saturn, Uranus, Neptune & Dwarf Planets

(Section 3 of 3)

What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars and planets

Skills and Knowledge to be Gained:

1. Describe the prime features of Saturn and explain how it differs from other planets in our solar system
2. Describe the chief characteristics of Uranus
3. Describe the relationship of Neptune and Uranus
4. Identify the unique features of Pluto
5. Describe the Nice Theory of Early Planetary Migration

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Warm Up Questions	Saturn (A)	Video 1 Saturn	Saturn (B)
Video 2 Saturn	Saturn (C)	Check On Learning A	Uranus (A)	Video Uranus	Uranus (B)	Neptune (A)	Video Neptune
Neptune (B)	Check on Learning B	The Dwarf Planets (A)	Video1 The Dwarf Planets	The Dwarf Planets (B)	Video2 The Dwarf Planets	The Dwarf Planets (B)	The Nice Theory of Early Planetary Migration
Review Questions	Closing Questions	Call for Other Questions					

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 15 / Section 3: NS2-M3C15S3 – Saturn, Uranus, Neptune & Dwarf Planets

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 15. Place a checkmark beside the NS2-M3C15S3 PowerPoint presentation, and these two CPS question deck files: NS2-M3C15S3- Key Terms and NS2-M3C15S3 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will look at special features and characteristics of each planet and discuss their similarities and differences. We will talk about some of the things scientists today have learned about the planets as a result of space missions that have orbited or landed craft on certain planets. We will discuss how, through the use of mathematics, Neptune's presence in a certain area of the sky was predicted before it was actually discovered. Finally, we will talk about the most recently discovered planet and what led to its discovery in 1930 by a young astronomer named Clyde Tombaugh.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-7
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "What is the criteria for a planet to be classified a dwarf planet? Name the dwarf planets." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on Saturn, Uranus, Neptune, Pluto and the Nice theory of Early Planetary Migration.	8
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	9

Chapter 15 / Section 3: NS2-M3C15S3 – Saturn, Uranus, Neptune & Dwarf Planets

Saturn	Explain that Saturn, the beautiful ringed planet, is named for the Roman god of time, and is the solar system's second-largest planet.	10
Video 1 on Saturn	Show video 1 on Saturn.	11
Saturn	Explain that If Saturn and its rings were placed between Earth and the moon, they would barely fit. The distance between Earth and the moon is 384,400 kilometers (238,900 miles).	12
Saturn	Explain that Saturn's rings are made up of billions of tiny solid particles. They extend outward from 7,000 miles to 171,000 miles above the planet's surface. They are on the plane of the planet's equator, tipped to the orbit at an angle of 26.8 degrees. The rings rotate about the planet, the inside ring moving at a faster speed than the outer ones.	13
Saturn	Explain that it is believed that Saturn's interior is composed of a core of rock covered by a mantle of ice. This in turn is surrounded by a dense atmosphere of compressed hydrogen, topped with clouds of methane and ammonia. At 886 million miles from the sun, Saturn has extremely low temperatures. It is believed that there is no solid surface for thousands of miles under the cloud layers. In this respect, Saturn may be quite similar to Jupiter.	14
Saturn	Explain that the <i>Pioneer 11</i> spacecraft that flew by Jupiter in late 1973, was redirected to make a flyby of Saturn in September 1979, while <i>Pioneer 10</i> continued outbound. There was some concern that its instruments would not continue to function for the Saturn encounter, as they had been designed to last only for the Jupiter mission, but in the end most worked perfectly, and continued to do so for years thereafter.	15
Saturn	Explain that over 150 moons have been discovered thus far in orbit around Saturn. Titan and Enceladus have drawn much scientific interest. Titan is of interest to scientists because it is the only known moon to have an atmosphere which is 98% nitrogen and 2% methane, at a surface temperature of -180 degrees C. Titan's atmosphere is believed to be similar to that of the primordial Earth. Whereas, Earth has a hydrologic cycle of liquid water, Titan has an analogous methane cycle. Volcanoes eject ice-water lava, and its rivers and lakes are filled with liquid ethane and methane, which rain in droplets through the atmosphere.	16-18
Saturn	Explain that Enceladus, a smaller moon that orbits inside of Titan, is of interest mainly because it may have liquid water beneath its south pole, making it a candidate for extraterrestrial life in some form. It has a relatively smooth, ice-covered surface, with unusual amounts of water volcanism in the south polar region.	19
Saturn	Explain that the two more capable Voyager spacecraft flew by Saturn and several of its moons in late 1980, and August 1981. A tremendous amount of new knowledge about the planet, its rings, and its moons was gained as a result, including dozens of spectacular high-resolution color pictures.	20
Saturn	Explain that the continued study of Saturn may shed much light on how the solar system was formed. The exploration of Saturn by the <i>Pioneer</i> and <i>Voyager</i> spacecraft is considered to be among the greatest achievements of science in the last century.	21
Saturn	Explain that following their encounters with Saturn, Voyager 1 continued on a path out of the solar system, and <i>Voyager 2</i> was redirected toward eventual flybys of Uranus in January 1986, and Neptune in August 1989. After having completed its "grand tour" of the outer planets, <i>Voyager 2</i> then followed its sister out of the solar system. <i>Voyager</i> will continue to transmit data until around 2018, when their power supplies will be exhausted.	22-23

Chapter 15 / Section 3: NS2-M3C15S3 – Saturn, Uranus, Neptune & Dwarf Planets

Saturn	Explain that <i>Voyager 1</i> overtook <i>Pioneer 10</i> in 1998 to become the most distant human-made object in space. It is now some 9 billion miles from Earth, with <i>Voyager 2</i> some 7 billion miles distant. Both overtook <i>Pioneer 10</i> and <i>Pioneer 11</i> because the <i>Voyagers</i> are proceeding at higher speeds.	24
Saturn	Explain that in 1997 an exploratory spacecraft called Cassini was launched to proceed to Jupiter for a four-year investigation of the planet and its moons. This was a joint venture of N.A.S.A., the European Space Agency (E.S.A.), and the Italian Space Agency (I.S.A.).	25
Video 2 on Saturn	Show video 2 on Saturn.	26
Saturn	Explain that Cassini is the largest and most sophisticated spacecraft ever built to explore a planet. It was outfitted with a probe called <i>Huygens</i> designed by E.S.A. to study the atmosphere and surface of Saturn's largest moon, Titan.	27-29
Saturn	Explain that in July 2004 the Cassini-Huygens spacecraft arrived at Saturn to start its mission. In December during its third orbit around the planet it released the Huygens probe for its 20-day journey to Titan, which it reached on 14 January 2005. The probe successfully completed a 21/2-hour descent to the surface, and once there, remained operational for another 70 minutes, all the while sending back much data about the moon's atmosphere and pictures of its surface. The data has given scientists a detailed idea of the composition of the moon's atmosphere and its surface features.	30-31
Saturn	Explain that the Cassini orbiter completed its mission in 2008 over Saturn and its moons. It began several additional new ones that will extend its observation of Saturn to at least 2017. Many new discoveries are sure to result.	32
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	33
Uranus	Explain that Uranus, named for the Greek god of the heavens, was discovered by Sir William Herschel in 1781.	34
Video on Uranus	Show video on Uranus	35
Uranus	Explain that Uranus is located almost 1.8 billion miles from the sun. The methane, ammonia, and hydrogen that make up the planet are primarily in a solid state, due to the -300 degrees F temperature.	36
Uranus	Explain that the planet has twenty-seven known small moons, including five that may be fragments of others that broke apart in the distant past. Uranus appears greenish when seen through the telescope, probably because of its atmospheric methane. In March 1977, scientists at Cornell University and Arizona's Lowell Observatory observed what seemed to be a system of rings in the space between the planet and its five larger moons.	37
Uranus	Explain that <i>Voyager 2</i> flew by Uranus on 24 January 1986 and verified the presence of the rings. It assessed them as composed of small gravel-like rocks and stones. It also discovered ten small moons, unobservable from Earth. Another significant discovery about the planet was that its magnetic axis is inclined about 65 degrees with respect to its spin axis, which was thought to make it unique among the planets of our solar system until <i>Voyager 2</i> found a similar situation at Neptune in 1989.	38

Chapter 15 / Section 3: NS2-M3C15S3 – Saturn, Uranus, Neptune & Dwarf Planets

Uranus	Explain that in late Dec. 2005, astronomers spied two more rings encircling Uranus, the first additions to the planet's ring system in nearly two decades. Astronomers now believe that Uranus has 13 rings. The faint dusty rings orbit outside Uranus' previously known rings, but within the orbits of its large moons.	39-40
Neptune	Explain that Uranus and Neptune are often called the twin planets, even though the latter is more than 1 billion miles farther from the Sun. They are similar, though, in size (roughly 30,000 miles in diameter) and composition.	41
Video on Neptune	Show video on Neptune	42
Neptune	Explain that when it was discovered that Uranus did not travel in its regular orbit at all times, astronomers figured that there had to be some object whose gravity pulled Uranus off its path. Astronomers calculated the probable position of such an object—and thus found the planet Neptune in 1848.	43
Neptune	Explain that Pluto is usually farthest from the sun. However, its orbit crosses inside of Neptune's orbit for 20 years out of every 248 years. Pluto last crossed inside Neptune's orbit on February 7, 1979, and temporarily became the 8th planet from the Sun.	44
Neptune	Explain that much of what we now know about Neptune and its satellites was discovered by Voyager 2 when it passed about 2,900 miles above the planet's north pole on 25 August, 1989. Neptune's orbital period around the sun is 165 years. Voyager's spectroscopy readings showed that Neptune's atmosphere is mainly hydrogen, with some helium and about 2 percent methane, which gives it a blue color. The interior is probably rock and water ice. Violent winds as high as 1,250 miles per hour were observed. Voyager's magnetometer discovered that Neptune's magnetic axis is tilted 47 degrees from the planet's rotational axis, similar to Uranus. Why these phenomena exist at both planets remains a matter of scientific speculation.	45-46
Neptune	Explain that Voyager also found three rings of dark, carbon-like material surrounding the planet and six previously unknown small moons circling it.	47
Neptune	Explain that following its encounter with Neptune, Voyager 2 went on to pass close to its largest moon, Triton. The spacecraft revealed even more amazing facts about this satellite. Its surface temperature was found to be -391 degrees F, making it the coldest body in our solar system, only 69 degrees F above absolute zero. Surface features strongly suggest the possibility of large-scale water-ice volcanism, making it unique in this respect in the solar system. Unlike other larger planetary moons, Triton has a retrograde orbit inclined about 23 degrees to Neptune's equator.	48-49
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	50
The Dwarf Planets	<p>Explain that as defined by the 2006 declaration of the International Astronomical Union (I.A.U.), a dwarf planet:</p> <ul style="list-style-type: none"> • is a celestial body that orbits the Sun • is massive enough for its own gravity to make it round and be formed into a sphere <p>But unlike a planet, a dwarf planet has not cleared its region of smaller objects around its orbit.</p>	51
The Dwarf Planets	Explain that currently the IAU recognizes only five dwarf planets that consist of: Pluto,	52-54

Chapter 15 / Section 3: NS2-M3C15S3 – Saturn, Uranus, Neptune & Dwarf Planets

	Haumea, Makemake, Eris, and Ceres. The first of these planets to be discovered in the Kuiper Belt was Pluto. The perturbations (variations in the regular orbit) of Uranus were not completely explained by the discovery of Neptune. In 1930 an American astronomer, Clyde Tombaugh, discovered Pluto after examining a series of telescopic photographs.	
The Dwarf Planets	Explain that name Pluto was selected because Pluto was the Roman god of darkness and the underworld. The planet Pluto is very dark indeed. It orbits at an average distance of 3.67 billion miles from the Sun.	55
Video 1 on the Dwarf Planets	Show video 1 on the dwarf planets.	56
The Dwarf Planets	Explain that Pluto is the largest of the known dwarf planets. Pluto is composed of rock and methane ice. It is about two-thirds the size of our Moon and has about one-sixth of its mass. Charon was discovered in 1978. It orbits Pluto in 6.4 days, exactly matching Pluto's rotation rate, so that, like Earth's moon, Charon always shows the same face to the planet. Two additional moons were discovered in February of 2006. Charon is about half the size of Pluto.	57-59
The Dwarf Planets	Explain that because of its unique orbital characteristics, scientists have speculated that perhaps Pluto is a comet or asteroid captured by the Sun's gravity, or even a satellite of Neptune thrown deeper into space by a close encounter with Neptune's large moon Triton. In January 2006 N.A.S.A. launched a New Horizon spacecraft that will fly by and photograph Pluto and Charon in 2015. Attempts to photograph the planet using the Hubble Space Telescope have been made, but because of the extreme distance, not much detail is observable.	60-61
Video 2 on the Dwarf Planets	Show video 2 on the dwarf planets.	62
The Dwarf Planets	Explain that Ceres was discovered in the asteroid belt between Mars and Jupiter in 1801. In early 2014 scientists using data from the Herschel telescope discovered water vapor rising from Ceres. Scientists think there may be a layer of ice just below the surface that gets heated by the sun, or the plumes could be spewed by ice volcanoes. A space probe called DAWN launched by N.A.S.A. in 2007 is due to arrive at Ceres in 2015.	63-64
The Nice Theory of Early Planetary Migration	Explain that it is theorized that Saturn, Uranus, and Neptune were much closer to Jupiter, with much leftover material (asteroids and comets) orbiting throughout the inner solar system. Beginning 600 million years after the formation of the solar system, gravitational forces caused by the leftover material by the planet, caused Saturn, Uranus and Neptune, to move outward.	65
The Nice Theory of Early Planetary Migration	Explain that some material from the inner solar system was flung outward to the Kuiper Belt and other material from the Kuiper Belts was propelled inward. It bombarded Mars, the Earth and its moon, and the other inner planets for at least the next 300 million years, during what is now known as the Late Heavy Bombardment period. This turmoil lasted until about 3.8 billion years ago, when it finally subsided and left the solar system in the form we see now.	66-67
The Nice Theory of Early Planetary Migration	Explain that Observations during the last decade indicate that such turmoil may be the norm, rather than the relative tranquility that our solar system has experienced during the last several billion years. The Nice Theory also gives rise to speculation that there may be many undiscovered dwarf planets in the Kuiper Belt and the Oort Cloud region, perhaps even additional cold and dark Earth and Mars-sized planets.	68

Chapter 15 / Section 3: NS2-M3C15S3 – Saturn, Uranus, Neptune & Dwarf Planets

Review Question	The Review Question is, “Describe the Nice Theory of planetary migration.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	69
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	70
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	71

III. Supplemental Activities -

A. In Class Activity:

Supplies required: pen and paper

When: At the end of the lesson

*Note - The planet walk is recommended if you have not conducted it from Chapter 12. If you have conducted the planet walk, it is worth a quick review of the distances for Saturn, Uranus, and Neptune.

- With the class: We have briefly discussed the planets in the solar system. In the last lesson we transited from the inner rocky planets to the gas giants of the outer solar system. Work in pairs to predict or list what you already know about the remaining planets or think will be discussed. What do you expect based on the discussion in the last lesson about Jupiter? What facts do you expect to verify during this lesson.
- As a class put up the major assumptions or agreed upon facts about the remaining outer planets.

B. Take Home Activity: If your community has a local astronomy club, try to arrange a night where the club can set up a telescope for your students to observe through. If Saturn is visible it will be an image that the student will never forget. Even with binoculars the rings of Saturn are visible, but only through higher magnification will they truly appreciate the view.

The solar system, we have now talked about the majority of the parts of the solar system. Each student needs to make a drawing of the solar system to include all the objects that have been discussed in Chapters 12-15. The distances from the sun should be represented when possible. Objects should be labeled and include pertinent facts about each one that they have learned. There are a couple of items not talked about in depth that the students should look up to include in their drawing (Asteroid belt, Kuiper belt, Ort cloud, and the Heliosphere). This may also be done as a model, but it will significantly increase the difficulty.

IV. Evaluation - see CPS database for chapter test questions.

Module 3 Chapter 16: NS2-M3C16 – Asteroids, Comets, and Meteorites

What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars and planets

Skills and Knowledge to be Gained:

1. Identify the asteroid belt as it relates to our solar system
2. Describe the composition of comets and their movement
3. Identify the difference between meteoroids, meteors and meteorites

Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.2. Integrate multiple sources of information presented in diverse media or formats...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards

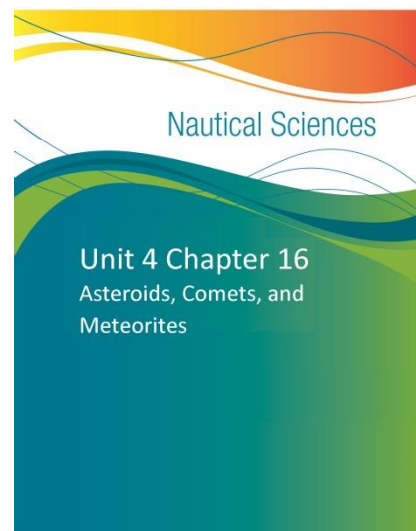
Dimension 4. Communicating Conclusions and Taking Informed Action

- D4.2.9-12. Construct explanations using sound reasoning, correct sequence, examples, and details with significant and pertinent information and data while acknowledging the strengths and weaknesses of the explanation given its purpose.

Next Generation Science Standards (NGSS)

HS.History of Earth

- HS-ESS1-6. Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history.



Module 3 Chapter 16: NS2-M3C16 – Asteroids, Comets, and Meteorites

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

Chapter 16 / Section 1: NS2-M3C16S1 – Asteroids, Comets, and Meteorites

(Section 1 of 1)

What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars and planets

Skills and Knowledge to be Gained:

1. Identify the asteroid belt as it relates to our solar system
2. Describe the composition of comets and their movement
3. Identify the difference between meteoroids, meteors and meteorites

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Introduction	Video Asteroids, Comets and Meteorites	Comets (A)	Check On Learning A
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Comets (B)	Video Comets	Comets (C)	Check on Learning B	Meteoroids, Meteors and Meteorites	Impacts with Earth	Review Questions	Closing Questions
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Call for Other Questions

Key:

Textbook Content

Student Engagement and Assessment

Chapter 16 / Section 1: NS2-M3C16S1 – Asteroids, Comets, and Meteorites

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, chapter 16. Place a checkmark beside the NS2-M3C16S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C16S1 - Key Terms and NS2-M3C16S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>On our trip through the solar system we have learned about the Moon, Sun, and the eight planets. Now we will discuss and identify asteroids, comets, and meteors. This lesson will assist you in understanding the part of the universe that is not a planet, Sun, or star. We will discuss the asteroid belt and how it relates to our solar system. We will learn about the composition of comets and their movement in the solar system. Finally, we will identify the difference between meteoroids, meteors, and meteorites.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-10
Opening Question(Random Pick a Student – “RPS”)	<p>This Opening Question is “If you were to look at the night sky, what are some things you might see?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on asteroids, comets and meteorites.</p>	11
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	12

Chapter 16 / Section 1: NS2-M3C16S1 – Asteroids, Comets, and Meteorites

Introduction	Explain that between the orbits of Mars and Jupiter there are a multitude of small bodies referred to as asteroids. The area in which they orbit the Sun is called the asteroid belt. They have irregular orbits, but all revolve around the Sun in the same direction as the larger planets. Approximately 2,000 of these asteroids have been discovered by astronomers so far, and many have been given names. Some scientists believe there may be 25,000 or more such bodies.	13
Introduction	Explain that astronomers long wondered why the large distance between Mars and Jupiter seemed to be without a planet. After several hundred years of looking, in 1801 the first and largest asteroid, Ceres, was found. Orbiting at a mean distance of 257 million miles from the Sun, Ceres is only 480 miles in diameter. Other asteroids are considerably smaller. Many have diameters of less than 1 mile.	14
Introduction	Explain that some astronomers think the asteroids are material that was left over when the solar system was formed about 4.6 billion years ago. Others believe that they are leftovers from a collision of two relatively small planets at some time in the distant past. Still others believe that they are the remnants of a small planet that exploded for some unknown reason.	15
Introduction	Explain that none of the asteroids have any kind of atmosphere. They appear to be little more than irregular chunks of rock and metallic substances.	16
Introduction	Explain that as has been previously mentioned, while the Galileo spacecraft was on its way to Jupiter, it passed close by the asteroids Gaspra in 1991 and Ida in 1993, photographing them and in the process discovering a small satellite named Dactyl orbiting the latter.	17-18
Introduction	Explain that in June 1997, a Near Earth Asteroid Rendezvous (NEAR) spacecraft launched in 1996 came within 750 miles of the carbon-rich asteroid Mathilde while on its way to a year-long encounter with the asteroid Eros, which it reached in February 2000. In February 2001 it landed on Eros's surface, after having transmitted some 200,000 detailed pictures of the asteroid back to Earth. The pictures reveal a surface strewn with boulders, craters, and mysterious bright spots. Eros is considered a geologic relic from the formation of the solar system about 4.5 billion years ago.	19-21
Video on Asteroids, Comets and Meteorites	Show video on asteroids, comets, and meteorites.	22
Comets	Explain that comets appear as bright streaks of light, sometimes visible without the aid of a telescope. They are the most plentiful bodies in our solar system, perhaps numbering in the millions. They are the travelers of the solar system. Comets wander in huge elliptical orbits, out of the plane of the ecliptic, far beyond the planet Pluto, but still revolving around our Sun.	23
Comets	Explain that most comets are thought to have little mass. They are believed to be composed of a nucleus of water ice, frozen gases, and dust-like particles of such elements as carbon and sodium, altogether rather like a dirty snowball. When a comet approaches the interior of the solar system, radiation from the Sun begins to heat it, causing particles of material and vapor to begin to be released. These form a halo around the nucleus called a coma. The nucleus and coma together form the head of the comet.	24-25
Comets	Explain that as the comet comes closer, pressure from sunlight causes the vapor and dust particles in the coma to fan out from the head in a direction opposite the Sun, forming the comet's tail. Certain gases in the coma, stimulated by the sunlight, begin to glow, much like a fluorescent bulb. When sunlight is reflected from the dust	26-27

Chapter 16 / Section 1: NS2-M3C16S1 – Asteroids, Comets, and Meteorites

	particles in the tail, the effects combine to make the comet visible from Earth. Luminous tails more than 200 million miles long have been observed. As the comet swings around the Sun, its tail appears to continually change direction, since it always points away from the Sun. As the comet moves away from the Sun, its tail is pushed in front of the head. Eventually the tail either disintegrates or is collected again by the nucleus. The comet will then return to the darkness of outer space.	
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	28
Comets	Explain that every trip around the Sun causes comets to lose some of their matter. Eventually they may break up completely, leaving debris all along the path that was once their orbit. Sometimes Earth crosses a part of a former comet path. The tiny particles then collide with our atmosphere, producing a meteor shower.	29
Comets	Explain that a comet is usually named for the first person to report its discovery. Probably the most famous comet is Halley's comet.	30
Video on Comets	Show Video on Comets	31
Comets	The British astronomer Edmund Halley computed the orbit of the great comet in 1682. In the process, he discovered that it had the same orbit as comets recorded by astronomers in 1531 and 1607. Halley suspected that all three were the same comet, which he calculated had a predictable orbital cycle of about seventy-six years. Explain that this prediction proved to be correct when the comet reappeared in 1758. Sightings of Halley's comet have continued into more recent history. It was sighted in 1834 and again in 1910. It reentered our solar system in 1986 and was photographed from close up by two Soviet Vega spacecraft and a European Space Agency probe called Giotto. They reported its composition to be mainly dirty water ice. Its nucleus appears to be potato-shaped, rather than spherical as had been expected.	32-33
Comets	NASA has thus far successfully launched two spaceprobe missions to study comets. The first, called Stardust, was launched in 1999 and collected from the comet Wild 2 dust that was returned to Earth in a capsule in 2006. Surprisingly, analysis of the dust found many compounds and particles that could only have been formed by heat, much nearer to the Sun. This gives support to the Nice Theory of migration of Neptune and Uranus in the early days of the solar system, according to which material like that discovered in the Wild 2 dust would have been flung outward from near the Sun to where it could be acquired by the comet.	34
Comets	Explain that a collection of cometary particle samples is accomplished by simply exposing blocks of aerogel to the material it encounters during spaceflight. These materials are believed to consist of ancient pre-solar interstellar grains and nebular that include remnants from the formation of the Solar System. Analysis of such fascinating celestial specks is expected to yield important insights into the evolution of the Sun, its planets, and possibly even the origin of life itself.	35-36
Comets	Explain that in late 2004 NASA launched a spacecraft called Deep Impact to travel to and send an 820-pound copper impactor probe crashing into the comet Tempel some 430 million km (260 million miles) from Earth, in order to investigate what lies within the surface of the comet. The impactor successfully struck the comet on the 4 July 2005 with a kinetic energy equivalent to 4.5 tons of TNT, creating a large double-flash, a plume of debris extending several thousand miles into space, and a crater in its surface about the size of a small sports stadium. The impact was observed by	37-38

Chapter 16 / Section 1: NS2-M3C16S1 – Asteroids, Comets, and Meteorites

	instruments in the fly-by module and by several space telescopes, as well as by professional and amateur astronomers on Earth.	
Comets	Explain that by analyzing the results of the impact, scientists hoped to learn more about the structure of the comet and whether or not it has any pristine material inside left over from the formation of the solar system 4.5 billion years ago. Preliminary results indicated that the comet is tightly packed rather than a loose conglomerate of material as some had speculated, and it contains less water than expected. There were also indications that the impact did not penetrate the comet's core, as had been hoped. More cometary impact missions are planned for the future as opportunities arise.	39-41
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	42
Meteoroids, Meteors and Meteorites	Explain that a meteoroid is a chunk of rock or metal orbiting in outer space. Meteoroids by the countless thousands orbit the Sun. Some are tiny particles of dust that eventually drift down through Earth's atmosphere. Others weigh anywhere from a few ounces to many tons. Meteoroids are invisible because of their relatively small size—until, by chance, they are drawn into the Earth's gravitational field. Then, as the meteoroid rushes through the atmosphere, it heats up from friction with the air. This causes it to sparkle brilliantly as it streaks across the sky toward Earth. Explain that when this happens, the meteoroid becomes a meteor. Meteors are usually seen only below a 100-mile altitude. Most of these little bodies burn up long before reaching Earth and arrive as tiny cinders of dust. The streak of light called a meteor or "shooting star" is actually the fiery death of a meteoroid.	43
Meteoroids, Meteors and Meteorites	Explain that occasionally the meteoroid is large enough that it does not burn up completely before it hits the Earth. As soon as it hits the ground, it is called a meteorite. An extremely large and bright meteor is called a "fireball." Fireballs often end up as large meteorites, landing somewhere on Earth.	44-45
Meteoroids, Meteors and Meteorites	Explain that there are two main kinds of meteorites: stony meteorites called aerolites and iron and nickel ones called siderites. Aerolites are much like the stones on Earth, composed of oxygen, silicon, magnesium, and some iron. The siderites, however, are about 90 percent iron, 8 percent nickel, and a mixture of other minerals. Of the meteorites that have been found, aerolites outnumber siderites two to one.	46
Meteoroids, Meteors and Meteorites	Explain that astronomers believe that most meteorites are the fragments of a shattered planet within the asteroid belt. Thus an analysis of them can tell us a good deal about the relative abundance of elements in the other planets. The stony meteorites probably came from the former planet's crust, while the iron ones came from the planet's core. Such study has convinced most astronomers and cosmologists that Earth's core is composed of iron and nickel.	47-49
Meteoroids, Meteors and Meteorites	Explain that as mentioned in the previous chapter, in 1996 quite a stir was raised in scientific circles when it was announced that a meteorite discovered in Antarctica and believed to have originated on Mars as the result of a comet or asteroid impact there appeared to contain fossilized evidence of ancient bacteriological life on Mars.	50
Meteoroids, Meteors and Meteorites	Explain that the largest meteorite ever found in the Western Hemisphere was discovered in Greenland by Admiral Robert Peary in 1894. It weighs thirty-four tons and presently is kept in the American Museum of Natural History in New York. A sixty-ton siderite has been found in southwest Africa, but it still lies where it landed. The largest meteorites found thus far are siderites.	51-52

Chapter 16 / Section 1: NS2-M3C16S1 – Asteroids, Comets, and Meteorites

Meteoroids, Meteors and Meteorites	Explain that a third kind of meteorite called a tektite has been found in widely scattered parts of the globe. This small meteorite usually weighs between an ounce and a pound. It is composed of a glassy compound having high silicon content, along with oxides of aluminum, magnesium, iron, calcium, sodium, and potassium. Some are nearly transparent, while others come in various shades of green, amber, and brown. Tektites do not resemble any rock or glass substance on Earth. They may have come from the interior of a destroyed planet where materials were subjected to extremely high temperatures. Considerable research is being devoted to tektites, for they may help solve many mysteries concerning the origin of the solar system.	53
Impacts with Earth	Explain that there has been much concern in recent years about the effect a very large meteoroid, asteroid, or comet would have if it were to strike Earth. Some scientists speculate that such an impact may have already occurred in the past off the Yucatán Peninsula in Central America, raising a planetary dust cloud that caused the extinction of dinosaurs in prehistoric times about 65 million years ago.	54-55
Impacts with Earth	Explain that a ring-shaped lake in Manicouagan, Canada, photographed from the space shuttle, marks the spot where a giant asteroid struck 210 million years ago. Earlier impacts may have repeatedly wiped out all surface life on Earth	56
Review Question	The Review Question is “What might be some of the effects of a large asteroid striking the Earth?” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	57
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	58
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	59

Chapter 16 / Section 1: NS2-M3C16S1 – Asteroids, Comets, and Meteorites

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Globe or World Map

When: At the end of the lesson

- With the class: Break into as many teams as there are maps or globes. If you have access to computers in class, the computers can be used as well to display a map of the world. (Google Earth for example)
- In 5 minutes each team is to identify as many meteorite impact locations as they can by simply looking at the map. Which team can find the most? Do all the other teams agree that the site could be an impact site? Why?

B. Take Home Activity: This activity may be delayed until an appropriate date arrives.

We have done quite a bit of observing during the lessons dealing with astronomy. This was to prepare you for the finale observation. During one of the planned meteor showers (look up when the closest date is) you will be conducting real science data collection. You should now be able to determine where a meteorite shower will be originating from if you are given its apparent source location. These meteor showers happen at predicted dates based on the passing of comets and the debris they have deposited in the Earth's orbit. As the Earth passes through these fields we experience a meteor storm. The astronomical community collects the hourly rate of observed meteors during these periods to verify models developed to predict comet debris. If at all possible check to see if your community has a local astronomy group who may be having an event during these periods that will allow your students to view the heavens through telescopes and support the scientific community.

During the event each student should record the number of meteors they observe during each hour. The data should be collected from all the students participating and correlated into a single data set. This can be done by a group of students and the results can be submitted to the class. For the American Meteor Society, they are looking for very specific information, their forms can be found at: <http://www.amsmeteors.org/ams-programs/visual-observing/>

Tech Tip: The site also contains supplemental information on meteors and observing them.

IV. Evaluation - see CPS database for chapter test questions.

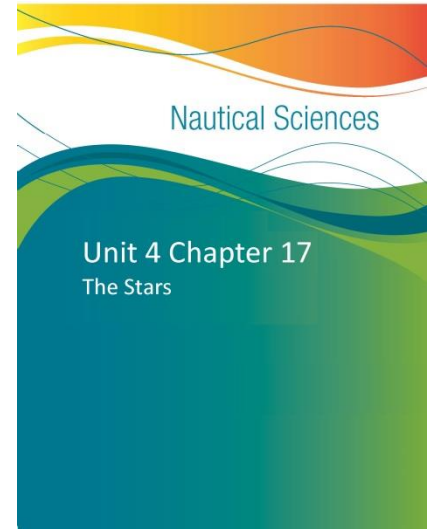
Module 3 Chapter 17: NS2-M3C17 – The Stars

What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars and planets

Skills and Knowledge to be Gained:

1. Explain the theory adopted as the common unit of astronomical distances
2. Explain the system used to classify stars
3. Describe the method used for determining a star's brightness
4. Explain the life cycle of a star
5. Explain the terms used to identify temporary stars from 134 B.C. to the present
6. Describe the three Nebulae stars and their makeup
7. Describe the binaries and star clusters
8. Describe the characteristics of our galaxy and the three ways other galaxies are classified according to their shapes



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Writing

- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically ...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

Chapter 17 / Section 1: NS2-M3C17S1 – The Stars

(Section 1 of 1)

What Students Will Learn to Do:

Demonstrate an understanding of astronomy and how it pertains to our solar system and its related bodies: Moon, Sun, stars and planets

Skills and Knowledge to be Gained:

1. Explain the theory adopted as the common unit of astronomical distances
2. Explain the system used to classify stars
3. Describe the method used for determining a star's brightness
4. Explain the life cycle of a star
5. Explain the terms used to identify temporary stars from 134 B.C. to the present
6. Describe the three Nebulae stars and their makeup
7. Describe the binaries and star clusters
8. Describe the characteristics of our galaxy and the three ways other galaxies are classified according to their shapes

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Introduction	Constellations	Stars Classified	Life Cycle of Stars
Check On Learning A	Exoplanets	Novae and Supernovae	Cepheid Stars and Pulsars	Check on Learning B	Binaries and Star Clusters	Nebulae	Galaxies
Supermassive Black Holes and Dark Matter and Energy	Review Questions	Closing Questions	Call for Other Questions				

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 17 / Section 1: NS2-M3C17S1 – The Stars

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, chapter 17. Place a checkmark beside the NS2-M3C17S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C17S1 - Key Terms and NS2-M3C17S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons. In this lesson we will take a look at the three Nebulae stars and discuss their makeup. We will discuss binaries, and star clusters, and finally, we will talk about the characteristics of our galaxy and the three ways other galaxies are classified according to their shapes.	1-4
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-23
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is “What are two units of measurement for distance in space?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on the stars.	24
Warm-Up Questions(Lesson questions 1-2)	Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions. Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.	25
Introduction	Explain that the stars are distant suns in space. The closest star, of course, is the Sun. But the universe contains literally billions upon billions of stars. The Sun is 93 million miles away. The next closest star is Proxima Centauri, about 26.46 trillion miles distant. It readily becomes apparent that we are talking of distances that are mind-boggling. Miles or kilometers are useless in measuring such vast spaces. Thus, the light-year has been adopted as the common unit of astronomical distances.	26-28

Chapter 17 / Section 1: NS2-M3C17S1 – The Stars

Introduction	Explain that a light-year is the distance that light travels in a year. This distance is, for practical purposes, nearly 6 trillion miles. Remember that a light-year is a unit of distance and not a unit of time, even though the word “year” is used. It is a bit like when you describe the distance to some location as a “twenty-minute drive” or a “fifteen-minute walk.” When astronomers say a star is “ten light-years away,” they mean that it takes light ten years to travel from the star to their observatory.	29
Introduction	Explain that even when using light-years to measure cosmic distances, the numbers can become huge. Modern telescopes can see out to distances of billions of light-years. This means, in fact, that astronomers are looking back “into time.” They see distant stars and galaxies as they were millions or billions of years ago, since it has taken their light that long to arrive on Earth. The light that is leaving the stars tonight will not reach here for countless centuries. Since radio waves and light waves travel at the same speed, any “communication” directed at beings in distant galaxies would not be received for at least that many years.	30-31
Constellations	Explain that when the ancients observed the stars in the sky, the patterns in which many of the brighter stars are arranged reminded them of various common terrestrial shapes. Over time many of these patterns, now called constellations, were given names of objects, animals, and even people that they seemed to resemble. Greek astronomer Hipparchus observed a new star in the constellation of Scorpius in 134 B.C. Another Greek astronomer, Tycho Brahe, observed a new star in the constellation of Cassiopeia in 1572.	32-33
Stars Classified	Explain that as we look at them in the sky, some stars appear brighter than others, and some can barely be seen with the naked eye. The relative brightness of a celestial body is called its magnitude. Astronomers call the brightness of a star as it appears to an observer on Earth its apparent magnitude. The first groups of stars to become visible at twilight are called the first-magnitude stars. They are considered to be a hundred times brighter than the faintest stars visible to the naked eye in full night, the sixth-magnitude stars.	34-35
Stars Classified	Explain that the nature of a star can best be determined from its spectrum (light and other electromagnetic wavelengths emitted), plus some other pertinent information. Different stars have different spectra, as the wavelengths and intensities of light and other radiations they emit vary with their size, composition, and temperature.	36
Stars Classified	Explain that there is a relationship between color and luminosity (brightness): In general, blue stars are large and bright. Red stars are usually smaller and dimmer, though there are a number of well-known giant and supergiant red stars. Colors range from blue through white, yellow, orange, and red. The Sun, a yellow star, is an average star in brightness and temperature.	37
Stars Classified	Explain that the spectrum-luminosity diagram graphs stars by color (spectrum) and magnitude or stellar brightness (luminosity).	38
Stars Classified	Explain that our Sun has an absolute magnitude of +5. The giant stars are given an absolute magnitude of 0, thus making them 100 times brighter than the Sun. There are even brighter stars called supergiants, which are as much as 1 million times as bright. Their absolute magnitudes would therefore be negative. Constellations were based on configurations of the larger, brighter stars that could be seen from Earth.	39-41
Stars Classified	Explain that Vega, Altair, and the Sun are medium-sized stars in the group called the main sequence on the spectrum-luminosity scale. The main sequence comprises 98 percent of all stars presently observed by astronomers.	42

Chapter 17 / Section 1: NS2-M3C17S1 – The Stars

Stars Classified	Explain that the most interesting class, however, is the one called white dwarfs. These stars are at least 100 times fainter than the Sun but are much hotter. They have about the same mass as the Sun, but they are smaller in size. The white dwarfs have densities much greater than any substance on Earth.	43
Stars Classified	Explain that red dwarfs are estimated to be about seventy-five percent of all stars in our galaxy. Red dwarf stars emit mostly infrared light and my last tens of billions of years longer than our Sun. Proximal Centauri, our nearest star, is a red dwarf. Stars in our galaxy are also classified by location in two distinct groups, Population I and Population II.	44-45
Stars Classified	Explain that Population I stars are found in regions where there is a great amount of dust and gas, such as the area near our Sun. They are young stars, still forming and adding mass. Population II stars are found in regions essentially free of dust and gas. They have used up the available supply of raw material from space and are, relatively speaking, near the end of their lives as luminous stars.	46-47
Life Cycle of Stars	Explain that a star begins as a huge, cold, dark sphere of gas and dust. Precisely where or how this original star material was formed is not known. Some astronomers believe it came from the ashes of stars long gone; others say it had been present since the “beginning,” at the Big Bang. We do know that stars are being born today out of the gas and dust of the Milky Way, our galaxy of stars. The main factor determining what kind of star will be born is how much gas and cosmic dust become locked together by gravity in that particular area.	48
Life Cycle of Stars	Explain that if there is a lot of material available there, the star will probably end up as a brilliant blue giant. If it is like most stars, it will become a yellow star like our Sun, with a much longer “life” than a blue giant. With even less dust and gas, it will become an orange dwarf that will live on for billions of years.	49
Life Cycle of Stars	Explain that it perhaps seems somewhat odd that the brighter stars have a shorter life. This is rather easily explained. The more fuel there is to burn, the greater the heat and the consumption rate; so, comparatively speaking, the brighter star is burning itself out faster. The rate of fuel consumption is set at the beginning and does not vary. Once the hydrogen-to-helium fusion cycle begins, it will continue until the hydrogen is exhausted.	50
Life Cycle of Stars	Explain that in the introduction to this unit, we described the probable birth of the Sun. Thus we need not explain the entire cycle of the birth of a star again. By way of review, we know that the radiation pressure eventually builds up toward the center of the gas-dust ball. As the temperature and pressure increase, the ball begins to glow. When the nuclear furnace starts working full time, the whole swirling gas ball glows, sending its energy out into space in the form of visible light and other electromagnetic radiation.	51
Life Cycle of Stars	Explain that most astronomers believe there is a “normal” evolution of stars. As the helium content builds up in the center, leftover hydrogen accumulates, upsetting the internal balance of the star. To compensate, the star increases in size and luminosity, until about one-eighth of the original hydrogen has been transformed to helium. The star continues to increase in size finally becoming a red giant. As a giant, the star consumes fuel at a tremendous rate, until its hydrogen is used up.	52
Life Cycle of Stars	Explain that once the nuclear fuel is spent, the core of most stars slowly collapses. The star throws off outer layers, which become planetary nebulae that dissipate in tens of thousands of years. The collapsed star becomes a dense white dwarf.	53

Chapter 17 / Section 1: NS2-M3C17S1 – The Stars

Life Cycle of Stars	Explain that giant stars, once they exhaust their fuel, can explode as supernovae, their cores collapsing to form extremely dense neutron stars. It is theorized black holes are the result of supergiant stars exploding.	54
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	55
Exoplanets	Explain that thus far over 3,500 exoplanets orbiting distant stars have been discovered, with even more possible candidates yet to be identified by further analysis of data from the Kepler space telescope. These extrasolar planets, or exoplanets, can be distinguished from other celestial bodies by watching the star for movement and visible dimming. This gravitational effect on the star being orbited causes a distinctive wobble as the star moves through space. The second primary indication of an exoplanet is a star that exhibits minor, periodic dimming, possibly caused by a planet passing across, or transiting, the star's disk.	56-58
Exoplanets	Explain that astronomers hope to be able to identify which exoplanets orbit within habitable zones, neither too hot nor too cold to support life. Many exoplanets orbit red dwarf stars, which are not considered conducive to life. Exoplanets that don't orbit a central star have been discovered. These rogue or Interstellar planets may have been ejected into space from accretion disks. Such disks are diffuse material in orbit around a central body, typically a young star.	59-60
Novae and Supernovae	Explain that there are two different events that make it seem a new star has appeared in the sky. Sometimes a star appears in the sky for the first time in recorded astronomical history. These stars have been called novae (plural form of nova, the Latin word for "new"). Novae are the most common, with an estimated 40 each year appearing in the Milky Way galaxy.	61
Novae and Supernovae	Explain that Novae are thought to develop when a white dwarf star is in a binary system with a red giant star. The white dwarf draws hydrogen from the red giant. The hydrogen ignites and the burst is seen as a sudden brightening.	62
Novae and Supernovae	Explain that another "temporary star" originates with a supernova. Only about three supernovae are observed within the Milky Way in a century. Supernovae blaze with luminosity as much as a million times that of an ordinary star, sometimes outshining an entire galaxy of stars for a few weeks. A supernova is thought to originate from the sudden collapse of a supergiant star, or from an implosion of a remnant neutron star formed after the collapse of a giant star.	63-64
Cepheid Stars and Pulsars	Explain that astronomers use cepheid stars as a reference to classify other stars. These bright stars expand and contract in regular cycles, which can be seen as a variation in brightness. This definite rhythm sets pattern called cepheid variables. A cepheid star is also called a pulsating star. When the star contracts, its internal pressure and temperature increase. The star expands in a sort of explosion. Then the process repeats itself. The duration of this cycle can be used to calculate its absolute magnitude, which provides the corresponding luminosity value. When other methods of determining distances are not practical because of extreme distance, cepheid variables provide a valuable method for calculating star distance.	65-67
Cepheid Stars and Pulsars	Explain that pulsars are relatively young, very dense neutron stars spinning at incredible rates, most likely the remnants of supernova explosions. Moving much like a lighthouse beam, they seem to blink on and off as they rotate. Pulsars rotate with such regularity, emitting beams of electromagnetic energy, that the timing of their beams rivals atomic clocks in precision.	68

Chapter 17 / Section 1: NS2-M3C17S1 – The Stars

Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	69
Binaries and Star Clusters	Explain that stars have a tendency to cluster together due to gravitational attraction. Pairs of stars are called binaries, or double stars. Larger groups of stars are referred to as star clusters.	70-71
Binaries and Star Clusters	Explain that clusters are classified both by their appearance and their "population." A moving cluster contains a few stars that travel in parallel lines. Open clusters are loosely grouped stars, often found in areas where there are glowing masses of dust and gas. Most open clusters are found in the Milky Way, so they often are called galactic clusters. Globular clusters contain thousands of stars—too many to count, even with the best photography. They may contain as many as 100,000 stars. Star clouds are clusters in which the stars are so thick that they look like glowing clouds.	72-73
Nebulae	Explain that nebulae, clouds of gas and dust visible in the heavens, are among the most beautiful of all astronomical phenomena. There are three kinds of nebulae. The bright nebula glows and is easily visible because there is a bright star nearby that illuminates it. A dark nebula is composed of the same gas and dust as the bright nebula, but it is visible only because it is silhouetted against the stars behind it; there is no illuminating star in the region of a dark nebula.	74-75
Nebulae	Explain that the third kind is the planetary nebula; this is actually a nova or temporary star with a large cloud of particles surrounding it as the result of the stellar explosion. These nebulae show considerable surface detail, even though they are much less dense than planets.	76
Galaxies	Explain that on a clear night you can see what appears to be a wispy cloud extending across the northern sky. It is in fact a vast band of stars called the Milky Way—our own galaxy. A galaxy is a huge collection of stars, star clusters, dust, and gas, all held together by gravitation.	77
Galaxies	Explain that the galaxy looks much like a spiral nebula. In fact, earlier astronomers thought the Milky Way was a nebula. But modern telescopes clearly show that the galaxy is composed of billions of stars too far away to be distinguished as separate points of light. The Milky Way is best seen on a clear summer night, running across the sky from north to south. The Milky Way has over 400 billion stars revolving around a massive black hole in the constellation Sagittarius.	78
Galaxies	Explain that as crowded as the stars in the Milky Way appear, we see only a fraction of the actual number because of the huge amount of gas and dust fogging up the space between the stars. Most of the stars in the center of the galactic swirl are thus blocked from view.	79
Galaxies	Explain that our Sun is located about two-thirds of the distance from the center of the galaxy to its outer rim. The Sun and the rest of our solar system revolve around the center of the galaxy, moving at a speed of about 150 miles per second. Still, it takes about 225 million years for us to complete one circuit.	80
Galaxies	Explain that Modern observatories have enabled astronomers to chart many distant galaxies, most of which have cepheid variables scattered throughout. Distance can be roughly calculated by tracking the cepheid cycles.	81
Galaxies	Explain that galaxies may be classified, according to their shapes, into three different groups (1) ellipsoidal galaxies, which have rather clearly defined, symmetrical shapes, ranging from spheres to ellipsoids; (2) spiral galaxies, which have a distinct nucleus with one or more spiral arms; and (3) irregular galaxies, which have no regular shape.	82

Chapter 17 / Section 1: NS2-M3C17S1 – The Stars

Supermassive Black Holes and Dark Matter and Energy	Explain that observations by the Hubble and Spitzer space telescopes and others have led astronomers to conclude that there are massive black holes in the centers of most galaxies, including our own. A black hole is a theoretical concentration of mass so great and so dense that not even light can escape its gravitational pull. Astronomers believe that black holes might be formed from imploding remnants of dying supergiant stars. The masses of black holes are proportional to the masses of the galaxies containing them. The one in the center of our galaxy may have a mass equal to 2 million times our Sun.	83-84
Supermassive Black Holes and Dark Matter and Energy	Explain that astrophysicists and cosmologists have observed that certain matter exhibits behavior at odds with currently understood theory of motion. One such example is that stars in our galaxy, regardless of their distance from the center, orbit at the same speed. It is theorized that subatomic particles, undetected even with powerful telescopes, exert gravitational effects on visible matter and the structure of the universe. They have called this invisible material dark matter. Dark matter doesn't seem to emit, reflect, or absorb light or any other electromagnetic radiation.	85-86
Supermassive Black Holes and Dark Matter and Energy	Explain that dark energy is a theory applied to some remaining anomalies observed. Distant galaxies are speeding away from our galaxy, and from each other, at rates and speeds proportional to their distances. Conventional theories of gravity and relativity cannot account for this motion. Such unexplained activity is attributed to dark energy. By some estimates, the observable universe, as we know it, constitutes only about 4%.	87-88
Review Question	The Review Question is "Name three characteristics of white dwarf stars." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	89
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	90
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	91

Chapter 17 / Section 1: NS2-M3C17S1 – The Stars

III. Supplemental Activities -

A. In Class Activity:

Supplies required: White Board

When: This is a good activity to do at the beginning of class

- With the class: In today's lesson we are going to talk about objects that are very far away. What are the different ways that you think that astronomers use to calculate distances. Give the cadets the first two:
 - The Moon's distance is measured regularly by means of a laser beam. Apollo Astronauts left special reflectors on the surface of the Moon that will reflect back any beam of light shined on them. Scientist then measure the length of time it takes for the light to go to and then return to Earth. That time is then converted into distance.
 - The next distance is measured by parallax, the angle between two observations made simultaneously of the same object will give you the distance to the intersection of the two lines (the object). Now it's your turn to come up with methods for measuring greater distances, up to millions of light years.
- Split the class into 4 groups and give them 5 minutes to discuss and come up with other methods for measuring greater distances, up to millions of light years. After 5 minutes is up, as a class list the ideas on the board at the end of the discussion time for the groups.

B. Take Home Activity: Today we learned about the different types of stars. Additionally we discussed the formation of stars, (that some of the bright stars seem to make a design or shape in the night sky). Using the Handout Constellations, have the Cadets look at the stars tonight and find three constellations in the night sky and make a sketch of the star formations.

Example



Have them be sure to include any of the nearby stars. Connect the constellation stars with lines to show the shape of the constellation. For each sketch, label the stars as main sequence, red super giant, red giant, or blue giant. If they cannot tell by just observing then they need to look up the type of star. Underline the star classification.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 17 / Section 1: NS2-M3C17S1 – The Stars

Activity 1: Take Home Activity – Constellations

Name: _____ Date: _____ Class: _____

Directions: Today we learned about the different types of stars. Additionally we discussed the formation of stars, (that some of the bright stars seem to make a design or shape in the night sky). Look at the stars tonight and find three constellations in the night sky and make a sketch of the star formations. Be sure to include any of the nearby stars. Connect the constellation stars with lines to show the shape of the constellation. For each sketch, label the stars as main sequence, red super giant, red giant, or blue giant. If you cannot tell by just observing then you need to look up the type of star. Underline the star classification.

Example:



Module 3 Chapter 18: NS2-M3C18 – Motion, Force, and Aerodynamics

What Students Will Learn to Do:

Demonstrate an understanding of Physical Science

Skills and Knowledge to be Gained:

1. Describe the two main topics in the field of physical science
2. Describe the six steps in the scientific method approach
3. Describe the differences in a theory and a law
4. Describe Newton's three laws of motion
5. Discuss Bernoulli's theorem
6. Explain how Mach numbers are derived

Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Writing

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.7. Conduct short as well as more sustained research projects to answer a question or solve a problem...
- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking & Listening

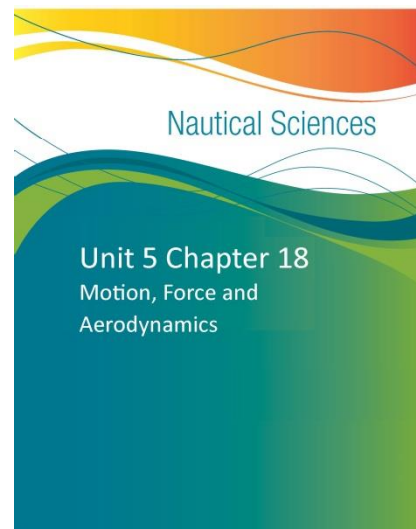
- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.2. Integrate multiple sources of information presented in diverse media or formats ...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

Next Generation Science Standards (NGSS)

HS.Forces and Interactions



Module 3 Chapter 18: NS2-M3C18 – Motion, Force, and Aerodynamics

- HS-PS2-1. Analyze data to support the claim that Newton’s second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.

HS.Waves and Electromagnetic Radiation

- HS-PS4-1. Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor’s Guide.

Chapter 18 / Section 1: NS2-M3C18S1 – Motion, Force, and Aerodynamics

(Section 1 of 1)

What Students Will Learn to Do:

Demonstrate an understanding of Physical Science

Skills and Knowledge to be Gained:

1. Describe the two main topics in the field of physical science
2. Describe the six steps in the scientific method approach
3. Describe the differences in a theory and a law
4. Describe Newton's three laws of motion
5. Discuss Bernoulli's theorem
6. Explain how Mach numbers are derived

LESSON FLOW OUTLINE

Unit Overview	Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction (A)	Video Intro to Motion, Force, and Aerodynamics
Introduction (B)	Newton's Law of Motion (A)	Video1 Newton's Law of Motion	Newton's Law of Motion (B)	Video2 Newton's Law of Motion	Newton's Law of Motion (C)	Video3 Newton's Law of Motion	Newton's Law of Motion (D)
Check On Learning A	Forces	Gravitational Attraction and g-Forces	Video Gravitational Attraction and g-Forces	Energy, Work, and Power	Check on Learning B	The Physics of Flight	Video The Physics of Flight
Mach Numbers and Sonic Booms	Review Questions	Closing Questions	Call for Other Questions				

Key:

Textbook Content	Student Engagement and Assessment
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Chapter 18 / Section 1: NS2-M3C18S1 – Motion, Force, and Aerodynamics

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 18. Place a checkmark beside the NS2-M3C18S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C18S1 - Key Terms and NS2-M3C18S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Unit Overview	Explain that since the dawn of recorded history humankind has sought to make sense of the world around us. In seeking to gain this understanding, we have made much progress in almost every field of human endeavor. Broadly speaking, science is the search for relationships that can be used to explain and predict how and why people, animals, and things behave as they do. When these relationships are applied to devices designed to assist us in satisfying our everyday needs and goals, this gives rise to technology.	1-3
Unit Overview	Explain that there are many branches of science. One branch consists of the biological sciences, which deal with the study of living things. Another branch is collectively referred to as the physical sciences, concerned with matter, forces, and energy. Two of the main topics in the physical sciences are physics and chemistry. Physics is the study of how forces, matter, and energy in various forms interact. Chemistry is the study of matter and how it changes under various conditions.	4-5
Unit Overview	Explain that other topical areas included in physical science are geology, the study of the Earth's structure; meteorology, the study of the atmosphere; and oceanography, the study of the oceans. These and other applied physical sciences used in the study of the Earth are now often referred to as the "Earth sciences." While they are often studied individually, all the physical sciences are ultimately related and are often dependent on one another. For example, an oceanographer must know about the chemistry of water, and a chemist must know about the physics of atomic structure.	6-8
Unit Overview	Explain that those who engage in the search for scientific truth are called scientists. Although some important scientific discoveries are made by chance, most are the result of prolonged work over time, called research. Doing research involves generating ideas, creating hypotheses (possible explanations), performing experiments to verify or sometimes disprove the hypotheses, and then publishing the results so others in the scientific community can carry the progress forward.	9
Unit Overview	Explain that scientists use many methods and techniques in their investigations, but all use some form of a systematic approach called the scientific method. It involves some or all of the following steps: (1) making observations, (2) forming questions, (3) forming hypotheses or explanations, (4) conducting experiments to test the hypotheses, (5) collecting data and analyzing the results, and (6) drawing conclusions. As the result of their applications of the scientific theory, scientists form theories and laws to help make predictions concerning the future.	10

Chapter 18 / Section 1: NS2-M3C18S1 – Motion, Force, and Aerodynamics

Unit Overview	Explain that a theory is a reasoned explanation of observed events, while a law is a statement that describes and predicts the future outcome of these events. Many times scientific theories and laws are expressed as mathematical equations that may be used to predict outcomes of natural events.	11-13
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will look at the physical factors affecting flight, such as flight physics, aerodynamic forces, and Mach number and speed regions. We will learn that Sir Isaac Newton formulated the three laws of motion in the 17th century and they are still valid to any object passing through the atmosphere. We will discuss the differences between a theory like Einstein's theory of relativity, and a law like Newton's laws of motion. We will discuss Bernoulli's theorem where he postulates that since the total energy in any isolated system remains constant if one element in any fluid system is decreased, another must increase to counterbalance it. We will learn how Mach numbers are derived. Speeds of missiles and high-performance aircraft are often expressed in terms of Mach numbers, rather than in miles per hour or knots. The Mach number is a ratio of the body's speed, to the speed of sound, in that particular region of the atmosphere.</p>	14-17
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	18
Key terms - Definitions	Reinforce the correct definition for each key term.	19-34
Opening Question(Random Pick a Student – "RPS")	This Opening Question is, "What key distinction does Einstein's Theory of Relativity make regarding the laws of motion?" Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on motion, force, and aerodynamics.	35
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	36
Introduction	Explain that the riddle of how and why things move has fascinated humankind since ancient times. About 2,300 years ago, Greek philosophers studied motion. As they observed the world around them, it seemed that all matter should be at rest or motionless in its normal state. Things that the Greeks observed to be in motion always seemed to tend to slow down and eventually stop. To their way of thinking, in order to keep moving an object had to have some unbalanced force acting on it. In the absence of such a force, a moving object would slow down and eventually stop.	37-38

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Introduction	Explain that the famous Greek philosopher Aristotle (384–322 B.C.) concluded from this that the speed of an object depends entirely on the force being applied to it and the resistance it meets. Aristotle’s law, however, was later proven to be inaccurate.	39
Introduction	Explain that in the sixteenth century, the Italian scientist Galileo Galilei observed that an object in horizontal motion would continue to move at the same speed with no additional force.	40
Video on an Introduction to Motion, Force, and Aerodynamics	Show video on introduction to motion, force, and aerodynamics.	41
Introduction	Explain that later in the same century this statement was accepted by Sir Isaac Newton, and with some elaboration, it became the basis of the first of his now-famous three laws of motion.	42
Newton’s Law of Motion	Explain that Newton’s first law of motion states that a body at rest tends to remain at rest, and a body in motion tends to remain in motion in a straight line, unless an outside force acts on the body. This law is sometimes called the law of inertia.	43
Video 1 on Newton’s Law of Motion	Show video 1 on Newton’s Law of Motion.	44
Newton’s Law of Motion	Explain that Newton’s second law of motion states that the acceleration of a body is directly proportional to the force acting on it, and inversely proportional to the mass of the body, and is in the same direction as the applied force. Mathematically this is often expressed by the formula $F = ma$.	45
Video 2 on Newton’s Law of Motion	Show video 2 on Newton’s Law of Motion	46
Newton’s Law of Motion	Explain that Newton’s third law of motion states that whenever one body exerts a force upon a second body, the second exerts an equal but opposite force back upon the first. Stated another way, for every action there is an equal but opposite reaction.	47
Video 3 on Newton’s Law of Motion	Show video 3 on Newton’s Law of Motion	48
Newton’s Law of Motion	Explain that taken together, Newton’s three laws describe the relationships among force, mass, acceleration, and velocity for all bodies in motion at relatively low speeds as compared to the speed of light, 3×10^8 meters per second or 186,000 miles per second. Such motion is often called Newtonian motion. Fortunately, most motion on Earth falls into this category. We can, therefore, easily use Newton’s laws to make all manner of predictions about things undergoing Newtonian motion. Sometimes, however, bodies in space can travel much faster. For them, time, mass, and length become distorted, and different rules devised by Albert Einstein (1879-1955) apply. These rules are collectively called Einstein’s theory of relativity, which he formulated early in the last century.	49-50
Check on Learning Questions A (Lesson questions 3-4)	Check in on student’s understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	51

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Forces	Let us take another look at Newton's second law of motion. How do we define acceleration? Acceleration is the change in velocity per unit of time, normally one second. Velocity is the rate of motion in a given direction. Other widely used units are feet per second, and in the metric system, meters per second or kilometers per hour. Force can be defined as power or energy exerted against a body in a given direction. Its units are pounds in the English system and Newton's (N) in the metric system. Mass is the quantity of material contained in a body. It is commonly confused with weight because the units of measurement are the same, but weight is a measure of force, while mass is a measure of the amount of matter in an object. In the metric system the unit of mass is the kilogram. In the English system mass is measured in pounds.	52-56
Forces	Explain that one kind of force that must be dealt with for all moving earthbound objects is friction. Friction is caused by contact between the moving object and other substances around it. The amount of the friction is dependent on the nature of the materials in contact, the force between them, and sometimes their velocity relative to each other. Solids moving against each other generate contact friction. Bodies moving through fluids such as water or air (considered a fluid in these cases) generate fluid friction, which increases with the speed of travel through the fluid. This type of friction is often called drag. Friction always acts in a direction opposite to the direction of motion. The energy generated by friction is usually dissipated in the form of heat.	57-60
Gravitational Attraction and g-Forces	Explain that in the science of motion, acceleration is often measured in terms of the standard acceleration of gravity, abbreviated by the letter g . A freely falling, frictionless body is attracted to the Earth by a force equal to its weight, with the result that it accelerates at a constant rate of approximately thirty-two feet (9.8 meters) per second each second (written as 32 ft./sec ² [9.8 m/sec ²]). Its acceleration while in this condition, called free fall, is thus said to be 1 g . The values given for it above are standard values at the Earth's surface.	61
Gravitational Attraction and g-Forces	Explain that the value of g may change, of course, if you ascend some distance above the Earth's surface or go into space or to some other celestial body, like the moon, where the acceleration due to gravity is different. You may have noticed in the astronomy unit of this text that the gravitational attraction of the moon, planets, and other bodies can be expressed in terms of multiples of g , such as 0.165 g in the case of the moon or 0.4 g in the case of Mars. The force of gravity on the moon is 1/6 that of Earth. A 120-pound person on Earth would weigh 20 pounds on the moon.	62-63
Gravitational Attraction and g-Forces	Explain that the weight of a body is an expression of the force of gravity on it at a given location, and may be calculated as a special case of Newton's second law, $F = ma$, by substituting g for a : $W=mg$. Note that weight varies, but mass is always constant.	64
Gravitational Attraction and g-Forces	Explain that bodies making rapid turns will experience other accelerations, and therefore forces, due to centripetal force (which can be many times that of gravity), often expressed as multiples of g . As an example, if a jet fighter making a tight turn experiences a sideways force of 5 g 's, there is a centripetal force on it equal to five times its weight. A missile or aircraft is designed to withstand only a certain number of g 's, and if that is exceeded damage to its structure, its payload, or its instruments may occur. In the case of manned aircraft, the pilot may black out (become unconscious).	65-66
Video on Gravitational Attraction and g-Forces	Show video on gravitational attraction and g -force.	67

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Energy, Work and Power	<p>Explain that there are many forms of energy. Some of these include:</p> <ul style="list-style-type: none"> • Kinetic – Faster motion = more kinetic energy • Gravitational - Higher, or more distant from center of gravitational attraction = more gravitational potential energy • Mechanical - Kinetic + gravitational energy = mechanical energy • Chemical - Energy within a substance that can be released as heat by a chemical reaction such as burning, or sometimes absorbed when combining with other compounds or elements • Electrical - Energy made available by the flow of electrical charge through a conductor; it can be converted into other forms of energy by passage through devices like heating elements or motors. • Nuclear - Energy that binds particles within the nucleus of an atom; it can be released as heat by radioactive decay, nuclear fission, or nuclear fusion. 	68-69
Energy, Work and Power	<p>Explain that in the metric system (International System, known by its French abbreviation, <i>SI</i>), the unit used for all types of energy is called a <i>joule</i>. In the English system, the units vary according to the type of energy: mechanical energy is measured in foot-pounds, heat in calories, electrical energy in kilowatt hours, and nuclear energy in electron-volts.</p>	70
Energy, Work and Power	<p>Explain that when a force acts through a distance, work is said to have been done. The formula is $W = Fd$. In the English system, foot-pounds are units of force of work and in the metric system, newton-meters. One newton-meter is called a joule. Doing work on a body increases its level of energy. It may gain height, velocity, or temperature, or sometimes all three. Under the proper conditions a body may be able to transform some of its energy back into work, thus losing energy. Therefore, there is equivalence between work and energy, indicated by the fact that they have the same units: foot-pounds in the English system and joules in the metric system.</p>	71-72
Energy, Work and Power	<p>Explain that the rate at which work is done or energy is gained / expended is power. The formula is $P = W/t$ or E/t. In the English system the unit of power is the horsepower, and in the metric system it is the watt. There are 746 watts in one horsepower. For example, if 10 newtons of force acted over a distance of 10 meters for 5 seconds, the power generated would be $(10 \times 10)/5$, or 20 watts (equivalent to about .013 horsepower). A larger unit of power called the kilowatt (KW), equivalent to 1,000 watts, is commonly used, especially in connection with electrical power consumption. If the United States ever fully adopts the metric system, all products such as automobile engines will be rated in kilowatts instead of horsepower. Most American-built marine engines used on boats already use kilowatts as their standard power units.</p>	73-75
Check on Learning Questions B (Lesson questions 5-6)	<p>Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.</p>	76
The Physics of Flight	<p>Explain that the path of a body in flight is determined by Newton's laws of motion, according to the forces acting upon it. Some of these forces are natural, and others are manmade. Various combinations of these forces produce different effects on the flight path. Aerodynamics is the science that deals with the motion of bodies moving through air and other gases. Missiles and aircraft use aerodynamic forces to maintain their flight path. The surface of a body in flight is called its airfoil. The aerodynamic forces acting on a moving airfoil are thrust, drag, gravity (weight), and lift. Other factors that can affect a body in flight are the angle of attack between the airfoil and the airstream, and in the case of a body flying in a curved path, centripetal force.</p>	77-79

Chapter 18 / Section 1: NS2-M3C18S1 – Motion, Force, and Aerodynamics

The Physics of Flight	Explain that the forces described in the previous slides is a vector quantity, meaning something that has both magnitude (length or size) and direction. All forces acting on a body can be mathematically combined by adding their vectors to form the resultant or net force. The net force determines the motion of the body, in accordance with Newton's laws.	80
The Physics of Flight	Explain that in the 1700s Daniel Bernoulli (1700-1782) postulated that since the total energy in any isolated system remains constant, if one element in any system of streamlined fluid flow is decreased, another must increase to counterbalance it. This is called Bernoulli's principle. Air flowing past the fuselage or over the wing of a guided missile or aircraft forms a system to which this theorem can be applied.	81
The Physics of Flight	Explain that when air passes over the streamlined convex wing of an aircraft, it must travel a greater distance than air passing under it. Since the two parts of the airstream reach the trailing edge of the wing at the same time, the air that flows over the wing must move faster than the air that flows under it. According to Bernoulli's theorem, this results in a lower pressure on the top than on the bottom surface of the wing. This pressure difference tends to force the wing upward, thereby giving it lift. Since most missiles use flat wings rather than the curved wings of conventional aircraft, they must get the necessary lift entirely from the angle of attack.	82-83
Video on the Physics of Flight	Show video on the physics of flight.	84
Mach Numbers and Sonic Booms	Explain that speeds of missiles and high-performance aircraft are often expressed in terms of Mach numbers, rather than in miles per hour or knots. The Mach number is the ratio of the body's speed to the speed of sound in that particular part of the atmosphere. For example, if an aircraft is flying at a speed equal to one-half the local speed of sound, it is said to be flying at Mach 0.5. If it moves at twice the local speed of sound, its speed is Mach 2.	85
Mach Numbers and Sonic Booms	Explain if the object reaches the speed of sound or greater (called supersonic speed), the pressure waves in front of and behind the object merge to form a conical shock wave, with an explosion-like noise called a sonic boom	86
Mach Numbers and Sonic Booms	Explain that supersonic aircraft are streamlined to reduce the effects of shock waves and sonic booms. Such measures include: <ul style="list-style-type: none"> • Decreasing thickness of fuselage and wings • Sweeping wings back • Decreasing wingspan • Extending length of nose 	87
Review Question	The Review Question is, "How does the shape of an aircraft wing affect forces exerted on it?" Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	88
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	89
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	90

Chapter 18 / Section 1: NS2-M3C18S1 – Motion, Force, and Aerodynamics

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handout for Take Home Activity

When: This activity should be done at the end of the lesson

- Have the cadets answer the following questions:
 1. How are Mach numbers derived?
 2. Is it a fixed quantity?
 3. What atmospheric phenomenon impacts the Mach number?
- Discuss each answer and have the Cadets be prepared to defend their response.

B. Take Home Activity: Using the Handout “Newton’s Laws of Motion”, have the cadets write a paper describing how Newton’s Laws of Motion operate using a guided missile fired from the ground at an airborne target. Tell them to be specific and make sure they apply correct grammar, spelling and punctuation.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 18 / Section 1: NS2-M3C18S1 – Motion, Force, and Aerodynamics

Activity 1: Take Home Activity – Newton’s Laws of Motion

Name: _____ Date: _____ Class: _____

Directions: Write a paper describing how Newton’s Laws of Motion operate using a guided missile fired from the ground at an airborne target. Be specific and make sure you apply correct grammar, spelling and punctuation.

Module 3 Chapter 19: NS2-M3C19 – Buoyancy

What Students Will Learn to Do:

Demonstrate understanding of Physical Science

Skills and Knowledge to be Gained:

1. Describe Archimedes Law
2. Explain how objects float
3. Explain how a submarine floats and submerges
4. Explain stability in a ship and its importance

Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Writing

- W.9-10.1. Write arguments to support claims in an analysis of substantive topics or texts...
- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Speaking & Listening

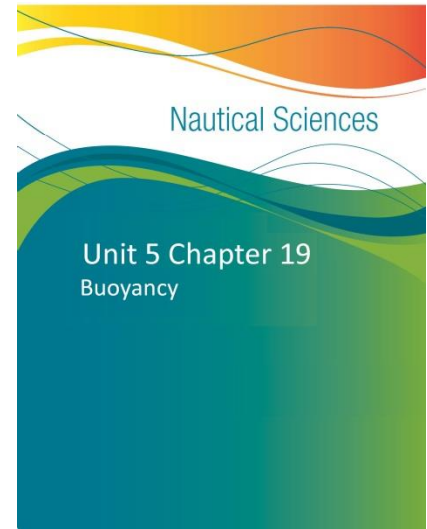
- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.



Chapter 19 / Section 1: NS2-M3C19S1 – Buoyancy

(Section 1 of 1)

What Students Will Learn to Do:

Demonstrate understanding of Physical Science

Skills and Knowledge to be Gained:

1. Describe Archimedes Law
2. Explain how objects float
3. Explain how a submarine floats and submerges
4. Explain stability in a ship and its importance

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	Why Objects Float (A)	Check On Learning A
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Why Objects Float (B)	The Submarine	Check on Learning B	Ship Stability	Review Questions	Closing Questions	Call for Other Questions
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Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 19. Place a checkmark beside the NS2-M3C19S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C19S1 - Key Terms and NS2-M3C19S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 19 / Section 1: NS2-M3C19S1 – Buoyancy

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will learn about buoyancy. This lesson will help us understand the reasons a metal ship floats or a submarine submerges and hovers at a desired depth. We will discuss Archimedes' law, which describes buoyant force. His principle is that an object immersed in a fluid is pushed up with a force that equals the weight of the fluid it displaces. This is true whether the fluid is a liquid or a gas. We will learn about ship stability and how the ship floats. We will also discuss how a submarine floats and submerges by using ballast tanks.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-9
Opening Question(Random Pick a Student – "RPS")	<p>This Opening Question is, "Name three types of vessels that are designed to take advantage of the buoyancy force." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on Buoyancy.</p>	10
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	
Introduction	<p>Explain that over 2,000 years ago the Greek scientist Archimedes (287–212 B.C.) found that an object immersed in a fluid is pushed up with a force that equals the weight of the fluid it displaces. This force has come to be called the buoyant force, and the principle that describes it is named Archimedes' law in honor of its discoverer. For purposes of Archimedes' law, it does not matter whether the "fluid" is a liquid or a gas. The law applies equally to both.</p>	12-13
Why Objects Float	<p>Explain that suppose that a stone with a volume of half a cubic meter weighs 9,800 newtons in air. When it was submerged in water, by Archimedes' law it would feel an upward force equal to the volume of water displaced, or 4,900 newtons in this case, since the weight of a cubic meter of water is 9,800 newtons. The apparent weight of the stone in the water—its weight in air minus the buoyant force—would now be 4,900 newtons and it would sink.</p>	14-16

Chapter 19 / Section 1: NS2-M3C19S1 – Buoyancy

Why Objects Float	Now let us suppose that instead of a stone, we had a hollow iron boat also weighing 9,800 newtons. We place the boat in the water and it begins to sink. As it does so, it begins to displace some of the water, so again by Archimedes' law it begins to feel an upward force equal to the weight of the water being displaced. After it has sunk into the water to the point at which a cubic meter of water has been displaced, it feels an upward force exactly equal to its weight, 9,800 newtons.	17
Why Objects Float	Explain that at this point the upward buoyant force exactly equals the downward weight, so there is no longer any net downward force on the boat. By Newton's first law, described in chapter 1 of this unit, objects with no net force on them tend to remain at rest. Thus, our boat would now float, assuming there were still some parts of it above water, called the freeboard. The line around the boat where the surface of the water meets it when it floats is called the waterline.	18-19
Why Objects Float	Now suppose a hole were drilled in the hull of our boat below the waterline, allowing the water to flow in. As it fills, the combined weight of the boat plus the water inside would be always be greater than the weight of the water being displaced, no matter how far down it sinks. Thus in this situation the boat would eventually fill completely and sink to the bottom, just as in the example of the stone above. So it really does not matter what material is used to construct the boat. A hollow boat will always float as long as there is still some part of it above water when it has sunk to a depth at which its weight is matched by the upward buoyant force provided by the water being displaced.	20-21
Why Objects Float	Explain that density is a scientific term used to describe how much of a material is present per unit of its volume. It is usually specified using the metric system, in kilograms per cubic meter or sometimes grams per cubic centimeter. Anything with a density less than that of water, such as wood, will always float, since when it sinks into water it will always achieve equality of the upward buoyant force with the downward weight before it is totally submerged. Solids having a greater density than water will always have a greater downward weight than upward buoyant force, so they will always submerge completely.	22-23
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	24
Why Objects Float	Explain that gases as well as liquids exert upward buoyant forces. Instead of a boat model, suppose we experiment with a small rubber balloon. If we blow up the balloon with air at the same or lower temperature than the air surrounding it, by Archimedes' law an upward force will begin to act on it equal to the weight of the outside air being displaced. But the weight of the balloon's skin plus the air inside it will be greater, thus causing the balloon to fall to the floor, just as the boat filled with water sank to the bottom.	25
Why Objects Float	But now suppose if we blew hot air, or a light gas such as helium, into the balloon. Heated air and light gases like helium are less dense than regular air, so they weigh less per unit volume. If we inflate our balloon to the same size as before, the same upward force as before would be felt by it. But the downward weight force would be less. The balloon, therefore, would rise into the air, since there is an unbalanced upward net force on it. In the case of a large balloon launched into the atmosphere, as the balloon rises the air gets thinner, so eventually at some altitude the upward buoyant force decreases to the point that it equals the downward weight, and the balloon floats at this altitude.	26-27

Chapter 19 / Section 1: NS2-M3C19S1 – Buoyancy

The Submarine	Explain that when cruising on the surface of a body of water, a submarine acts just like the boat model described above. It will sink only partially into the water, to a depth at which its weight is balanced by the upward buoyant force of the water it displaces. For most submarines this happens when the hull is about two-thirds submerged.	28-30
The Submarine	Now suppose that the submarine wants to submerge completely. To do this, it needs more weight to compensate for the upward buoyant force exerted on it by the weight of the water displaced by its totally submerged hull. To provide the weight, submarines are fitted with fillable water tanks inside their structure called ballast tanks. When water is pumped into these tanks, their weight plus the structural weight of the submarine now combine to weigh more than the upward buoyant force, so the submarine dives. To level off at some desired depth, the submarine adjusts the amount of water in the ballast tanks until the downward weight and upward buoyant force are roughly in balance. The propulsion system of the submarine plus its diving planes can now keep the submarine at the desired depth, like an airplane flying at some level in the atmosphere. If the weight and buoyant force were exactly matched, the submarine would be able to hover at the desired depth without any forward propulsion, much like the balloon hovering in air.	31-36
The Submarine	Explain that to surface from a submerged depth, the submarine forces water out of the ballast tanks with compressed air until the upward buoyant force is once again greater than the downward weight. At this point the submarine will surface, aided by its propulsion system. Thus, a submarine in water acts much like a balloon in air, even though the densities of the media in which they operate are much different.	37-39
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	40
Ship Stability	Explain that one of the considerations in ship design is that it should be stable in a wide variety of sea conditions and if damaged. The stability of a ship is dependent on the location of its center of gravity and its center of buoyancy at various angles of inclination or roll. The center of gravity is defined as the center of mass of the ship, around which the ship seems to move. The center of gravity does not change position as the ship moves. The center of buoyancy is the geometric center of the portion of the ship's hull that is underwater. It tends to move in an arc as the ship rolls. For good stability a ship should have its center of gravity as low as possible in the hull, so that there is a large amount of horizontal distance between the downward force through the center of gravity and upward force through the center of buoyancy. This will generate torque (force of rotation) that will tend to right the ship whenever it rolls. If the center of gravity rises because of either intentional or unintentional addition of weight high in the ship, this righting torque will tend to decrease, and the ship's stability may be impaired to the point that it might capsize if it rolls too far.	41-50
Ship Stability	Explain that because of the foregoing, if a lightly loaded ship is operating in heavy weather, it will sometimes take on additional water in tanks near the keel (bottom), or fill empty fuel tanks with water, in order to lower its center of gravity as low as possible. In this condition it will be less likely to experience dangerous rolls in stormy seas. The additional water is called ballast.	51
Review Question	The Review Question is "Name three precautionary measures to prevent a ship from sinking or capsizing." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	52

Chapter 19 / Section 1: NS2-M3C19S1 – Buoyancy

Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	53
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	54

III. Supplemental Activities -

A. In Class Activity:

Supplies required: a 4"x 4" solid cube of heavy wood, a 4"X 4" cube of lighter type of wood or hollowed out block of wood, a 4" x 4" block of Styrofoam, a tub full of water deep enough to float the wood in

When: either at the beginning or end of the lesson on buoyance

- In Class: Fill the tub with water and place each block in one at a time. Have the cadets make observations about how far each one floats. Ask them to write a paragraph that explains why the three objects do not float in water in quite the same ways.
- Ask students to predict the weight of water that would be displaced by an empty canoe weighing 120 pounds. Assume the canoe is afloat. Also, ask if the amount of water displaced by the same canoe would increase or decrease if the canoe tipped over, filled with water, and sank.

B. At Home Activity: Using the Handout "Buoyancy" have the cadets write a paragraph that explains why a lump of clay will sink in water, but the same volume of clay, when shaped like a bowl, will float in water. Similarly, you can ask students why a bar of steel will sink in water, but ships made of steel do not. Give the Cadets the option of including diagrams with their explanations. Also ask them to answer the question "Why is it important for anyone connected with watercraft to know something about the laws of buoyancy and stability"?

IV. Evaluation - see CPS database for chapter test questions.

Chapter 19 / Section 1: NS2-M3C19S1 – Buoyancy

Activity 1: Take Home Activity – Buoyancy

Name: _____ Date: _____ Class: _____

Directions: Write a paragraph that explains why a lump of clay will sink in water, but the same volume of clay, when shaped like a bowl, will float in water. Also explain why a bar of steel will sink in water, but ships made of steel do not. If needed, you are allowed to include diagrams with your explanation.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Why is it important for anyone connected with watercraft to know something about the laws of buoyancy and stability?

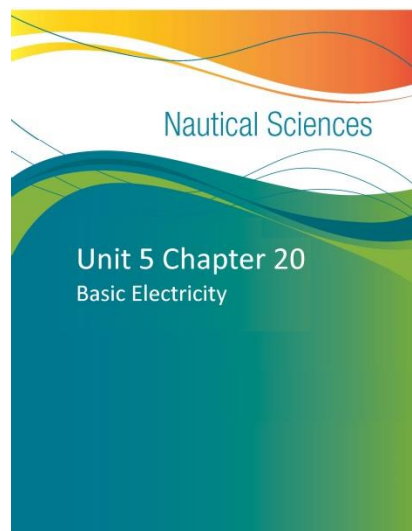
Module 3 Chapter 20: NS2-M3C20 – Basic Electricity

What Students Will Learn to Do:

Demonstrate understanding of Physical Science

Skills and Knowledge to be Gained:

1. Describe the fundamental theory of electricity
2. Describe the properties of conductors and insulators
3. Describe the six common methods of producing voltage
4. Describe battery construction and significant characteristics
5. Explain the principle of electrical circuits
6. Describe Ohm's Law as it relates to current voltage and resistance
7. Discuss electrical power theory



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Writing

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

Module 3 Chapter 20: NS2-M3C20 – Basic Electricity

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

Chapter 20 / Section 1: NS2-M3C20S1 – What is Electricity

(Section 1 of 2)

What Students Will Learn to Do:

Demonstrate an understanding of Physical Science

Skills and Knowledge to be Gained:

1. Describe the fundamental theory of electricity
2. Describe the properties of conductors and insulators
3. Describe the six common methods of producing voltage

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Warm Up Questions	Introduction	Check On Learning A	Conductors and Insulators
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Check on Learning B	Voltage (A)	Video Voltage	Voltage (B)	Review Questions	Closing Questions	Call for Other Questions
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Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, chapter 20. Place a checkmark beside the NS2-M3C20S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C20S1 - Key Terms and NS2-M3C20S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 20 / Section 1: NS2-M3C20S1 – What is Electricity

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>All modern Naval warfare depends on the use of sophisticated electronic equipment. An understanding of the fundamentals of electricity is essential to the maintenance, operation, and employment of this equipment. In this lesson we will discuss voltage and the various ways it can be produced. We will discuss how electricity can be moved through conductors and the force that opposes this movement. We will learn about the six common methods of generating voltage: Friction, Pressure, Heat, Light, Chemical action, and Magnetism. We will discuss Ohm's law and how it allows us to calculate electrical circuit values. We will discuss the electrical power theory and learn how to calculate electrical power.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-8
Opening Question(Random Pick a Student – "RPS")	This Opening Question is "Name the three best conductors of electricity, and explain why two of them are used most often." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on basic electricity.	9
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	10
Introduction	Explain that the study of electricity began with the ancient Greeks. They discovered that by rubbing a mineral called amber with a cloth, they could create a mysterious force of attraction between the cloth and the amber. They also observed that after they rubbed two different ambers with two different cloths, the two cloths would repel one another—as strongly as they were attracted to amber. These forces were called electric (from the Greek word for amber), and the cloths and ambers were said to be electrically charged.	11-15
Introduction	Explain that although the Greeks discovered electric force, they could not explain it. In fact, it was not until the atomic theory of matter was developed that the true cause of	16-19

Chapter 20 / Section 1: NS2-M3C20S1 – What is Electricity

	electricity was found. When scientists discovered that atoms were composed of negatively charged particles (electrons) that orbit around positively charged particles (protons), they could explain electrical charge. Normally there is a balance between the negative charge of electrons and the positive charge of protons.	
Introduction	Explain that under most conditions, an atom will have no charge. But if the number of electrons is increased, the atom will become negatively charged. On the other hand, if electrons are taken away, the atom will have a positive charge. Charged atoms are called ions.	20-22
Introduction	Explain that one of the fundamental laws of electricity is that like charges repel each other, and unlike charges attract each other. In the atom, the electrons are held in their orbit by the attractive force between them and the protons in the nucleus. In the Greeks' experiments with amber, the cloth picked up electrons from the amber, thus becoming negatively charged. This left the amber with a positive charge—and unlike charges attract one another.	23-25
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	26
Conductors and Insulators	Explain that an electric charge can move through a material if it has a large number of free electrons—that is, electrons that can easily move from atom to atom in the material. Substances that permit the free motion of a large number of electrons because of their atomic structure are called conductors. Silver, copper, and aluminum wire, in that order, are the best conductors. However, copper and aluminum wire are the most commonly used because they are least expensive. Electrical energy is conveyed at the speed of light through conductors by the free electrons. As the electrical energy passes, each electron moves a very short distance to the neighboring atom, where it replaces one or more electrons by forcing them out of their orbits. The replaced electrons repeat the process in other nearby atoms.	27-34
Conductors and Insulators	Explain that some substances have very few free electrons and are therefore poor conductors. These substances, such as rubber, glass, or dry wood, are called insulators. Good conductors such as wire are used to carry electricity, and they are covered by insulating material to prevent the electricity from being diverted from the conductors.	35-37
Check on Learning Questions B (Lesson questions 5-6)	Check in on student's understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	38
Voltage	Explain that the force that causes electricity to move in a conductor is called voltage or electromotive force (E). There are six basic ways to generate voltage	39-41
Voltage	Explain that voltage can be produced by rubbing two materials together. Static electricity is the most common name for this type. It occurs frequently in dry climates or on days of low humidity.	42-43
Voltage	Explain that voltage can be produced by squeezing crystals such as natural quartz or, more usually, manufactured crystals. Compressed electrons tend to move through a crystal at predictable frequencies. Crystals are frequently used in communications equipment.	44-45
Voltage	Explain that voltage can be produced by heating the place where two unlike metals are joined. The hot junction where the moving electrons from the two different metals meet is called a thermocouple. The difference in the temperature of the two metals determines the amount of voltage. As a result, thermocouples are often used to	46-48

Chapter 20 / Section 1: NS2-M3C20S1 – What is Electricity

	measure and regulate temperature, as in a thermostat.	
Voltage	Explain that voltage can be produced when light strikes a photosensitive (light-sensitive) substance. The light dislodges electrons from their orbits around the surface atoms. Voltage produced in this manner is called photoelectric. The photoelectric cell is the device that operates on this principle. A plate coated with compounds of silver or copper oxide, which are extremely sensitive to light, can also produce a flow of electrons. Light is used to generate voltage in devices requiring extreme precision—such as television cameras, automatic processing controls, door openers, and burglar alarms.	49-52
Voltage	Explain that voltage can be produced by chemical reactions, as in a battery cell. The simple voltaic battery consists of a carbon strip (positive) and a zinc strip (negative) suspended in a container with a solution of water and sulfuric acid. This solution is called the electrolyte. The chemical action that results from this combination causes electrons to flow between the zinc and carbon electrodes.	53-55
Video on Voltage	Show Video on Voltage	56
Voltage	Batteries are used as sources of electrical energy in automobiles, boats, aircraft, ships, and portable equipment.	57
Voltage	Explain that voltage can be produced when a conductor moves through a magnetic field, or vice versa, in such a manner as to cut the field's lines of force. This is the most common source of electric power; it is the method used in electric generators. Usually, a copper-wire conductor is moved back and forth through the magnetic field created by a U- or C-shaped electromagnet.	58-60
Voltage	Explain that an instrument designed to measure voltage in an electrical circuit is called a voltmeter.	61
Review Question	The Review Question is “Name one mechanism using each of the following voltage sources: pressure, light, chemical action, and magnetism.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	62
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	63
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	64

Chapter 20 / Section 1: NS2-M3C20S1 – What is Electricity

III. Supplemental Activities -

A. In Class Activity: Conductor or Insulator

Supplies: 1-D Cell battery, 1-Battery holder, 1 - 1.5 volt bulbs, 1 socket for the light bulb (or E-10 light bulb bases), 3 pieces of 6-inch insulated solid strand copper wire (18–22 gauge), with one inch of insulation removed at each end wire, Handout for each student, rubber band, penny, nickel, toothpick, key, paper clip, brass paper fastener, glass microscope slide, pencil, Styrofoam, aluminum soda can, screw, plastic cup, yarn or string; handout for take home activity

When: at the end of the lesson

- Before class, construct a simple circuit conductivity tester.
 - a. Your simple circuit should have two pieces of wire – one end of each piece of wire should be attached to the battery, the other end of each piece of wire should be attached to the light bulb.
 - b. Remove the wire from the bottom of the battery; leave it connected to the light bulb. Wrap a paper fastener around the loose end of this wire.
 - c. Attach a third piece of wire to the bottom of the battery. Wrap a paper fastener around the loose end of this wire.
- During class show the cadets the objects you will be testing. Have them predict whether it is a conductor or insulator. Once they have completed their predictions, test your objects one at a time. Place each object between the paper fasteners, making sure they touch and have a good connection.

B. Take Home Activity: Using the handout “Voltage” have the cadets name the 6 common methods of producing voltage and give examples of each method.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 20 / Section 1: NS2-M3C20S1 – What is Electricity

Activity1: In Class Activity – Conductors and Insulators

Name: _____ Date: _____ Class: _____

Directions: Write the description of what a conductor and an insulator are.

Make your predictions in the second column of what each object in the chart below is.

After you have made your predictions, as a class test the objects, and write down the result in the third column.

What is a conductor:

_____?

What is an insulator: _____?

Complete the table. Predict whether each item is made from a material that is a conductor or insulator. Then test each item to determine if it is made from a conductor or insulator.

Object	Prediction: Conductor or Insulator?	Result: Conductor or Insulator?
Rubber Band		
Penny		
Nickel		
Toothpick		
Key		
Paper Clip		
Brass Paper Fastener		
Glass Microscope Slide		
Pencil		
Styrofoam		
Aluminum Soda Can		
Screw		
Plastic Cup		
Yarn or String		

Chapter 20 / Section 1: NS2-M3C20S1 – What is Electricity

Activity1: Take Home Activity – Voltage

Name: _____ Date: _____ Class: _____

Directions: Name the 6 common methods of producing voltage and give examples of each method.

1.

2.

3.

4.

5.

6.

Chapter 20 / Section 2: NS2-M3C20S2 – Current

(Section 2 of 2)

What Students Will Learn to Do:

Demonstrate an understanding of Physical Science

Skills and Knowledge to be Gained:

1. Describe battery construction and significant characteristics
2. Explain the principle of electrical circuits
3. Describe Ohm's Law as it relates to current voltage and resistance
4. Discuss electrical power theory

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Key terms	Key Term Definitions	Opening Question	Warm Up Questions	Current	Batteries (A)	Video Batteries
Check On Learning A	Batteries (B)	Check on Learning B	Ohm's Law	Power	Review Questions	Closing Questions	Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 20. Place a checkmark beside the NS2-M3C20S2 PowerPoint presentation, and these two CPS question deck files: NS2-M3C20S2 - Key Terms and NS2-M3C20S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 20 / Section 2: NS2-M3C20S2 – Current

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will discuss how electricity can be moved through conductors and the force that opposes this movement. We will learn about the six common methods of generating voltage: Friction, Pressure, Heat, Light, Chemical Action, and Magnetism. We will discuss Ohm's law and how it allows us to calculate electrical circuit values. We will discuss the electrical power theory and learn how to calculate electrical power.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-8
Opening Question(Random Pick a Student – "RPS")	<p>This Opening Question is, "Name three substances that can be used as the electrolyte component in batteries." Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student's name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students' responses to the question on the slide, focusing on Current.</p>	9
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students' level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	10
Current	<p>Explain that the flow of electricity through a conductor is called electric current. Electric current is classified into two general types: direct current and alternating current. Direct current flows continuously in the same direction, while an alternating current periodically reverses direction. An ampere (or amp) is the unit used to measure the rate at which current flows. The symbol for current flow is "I."</p> <p>Explain that an instrument designed to measure current in an electrical circuit is called an ammeter.</p>	11-13
Current	Explain that every material offers some resistance or opposition to the flow of electric current. Good conductors offer very little resistance, while insulators or poor conductors offer high resistance. The size and composition of wires in an electric circuit are designed to keep electrical resistance as low as possible. A wire's resistance depends on its length, diameter, composition, and temperature.	14-16

Chapter 20 / Section 2: NS2-M3C20S2 – Current

Current	Explain that manufactured circuit elements that provide a definite specified amount of resistance are called resistors. Resistance is measured in ohms (symbol: Ω , the Greek letter Omega). One ohm is the resistance of a circuit element (or circuit) that permits a steady current of one ampere to flow when a potential difference of one volt is applied to that circuit.	17-19
Current	Explain that an instrument designed to measure resistance in an electrical circuit is called an ohmmeter.	20
Batteries	Explain that a battery consists of a number of cells assembled in a common container and connected to function as a source of electrical power. A cell is the fundamental unit of a battery. A simple cell consists of two electrodes placed in a container holding the electrolyte.	21-24
Batteries	Explain that the electrodes are the conductors by which the current leaves or returns to the electrolyte. In a simple cell, they are carbon and zinc strips, placed in the electrolyte. In the dry cell there is a carbon rod in the center and a zinc container in which the cell is assembled. The electrolyte may be a salt, an acid, or an alkaline solution. In the automobile storage battery the electrolyte is in liquid form. In the dry cell battery, the electrolyte is a paste.	25--29
Batteries	Explain that a primary cell is one in which the chemical action eats away one of the electrodes, usually the negative. Eventually the electrode must be replaced or the cell discarded. In the case of the common dry cell, as in a flashlight battery, it is usually less expensive to buy a new cell.	30
Batteries	Explain that a secondary cell is one in which the electrodes and the electrolyte are altered by the chemical action that generates current. These cells may be restored to their original condition (recharged) by forcing an electric current through them in the opposite direction to that of discharge. The automobile storage battery is a common example of a battery composed of secondary cells.	31
Video on Batteries	Show video on batteries.	32
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	33
Batteries	Explain that whenever two unequal charges are connected by a conductor, a pathway for electrons and thus current flow is created. An electric circuit is a pathway consisting of the conductor and the path through the voltage source. For example, a lamp connected by wires to a dry cell's terminals forms a simple electric circuit.	34
Batteries	The electron current flows from the negative (–) terminal of the battery through the lamp to the positive (+) battery terminal, and continues by going through the battery from the (+) terminal to the (–) terminal. As long as this pathway is unbroken, it is a closed circuit and current will flow.	35-37
Batteries	Explain that when electrical experiments were first conducted in the 1800s, the electron was as yet undiscovered and it was assumed that current was a flow of positive charges from the positive to the negative terminals of a source in a circuit. This idea became so widespread that still today for many applications, electrical current is said to proceed from positive to negative terminals. In the scientific community however, the idea of an electron current flowing from negative to positive is more prevalent and probably easier to understand, so that is the concept used in our discussion of electricity.	38

Chapter 20 / Section 2: NS2-M3C20S2 – Current

Batteries	Explain that a schematic is a diagram in which symbols rather than pictures are used for a circuit's components. These symbols are used in an effort to make the diagrams easier to draw and easier to understand. Schematic symbols aid the technician who designs or repairs electrical or electronic equipment.	39-40
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	41
Ohm's Law	<p>Explain that in the early 1800s, George Simon Ohm proved that a definite relationship exists among current, voltage, and resistance. This relationship, called Ohm's law, is stated as follows: The current in a circuit is directly proportional to the applied voltage and inversely proportional to the circuit resistance. Ohm's law may be expressed as an equation: $I = E/R$ (Equation A).</p> <p> I = current in amperes E = voltage in volts R = resistance in ohms </p> <p>If any two of the quantities in the equation are known, the third may be easily found.</p>	42-45
Ohm's Law	<p>Example: Circuit 1 contains a resistance of 1.5 ohms and a source voltage of 1.5 volts. How much current flows in the circuit?</p> <p>Solution: $I = E/R = 1.5 \text{ V}/1.5 \Omega = 1 \text{ ampere}$</p>	46-48
Ohm's Law	Explain that in many circuit applications, the current is known, and either the voltage or the resistance will be the unknown quantity. To solve a problem in which current and resistance are known, the basic formula for Ohm's law must be transformed to solve for E. Multiplying both sides of the equation by R, the formula for finding voltage is: $E = IR$ (Equation B).	49-52
Ohm's Law	Explain that similarly, to transform the basic formula when resistance is unknown, multiply both sides of the basic equation by R and then divide both sides of the equation by I. The resulting formula for resistance is: $R = E/I$ (Equation C).	53-55
Power	Explain that electrical power refers to the rate at which work is being done. Work is done whenever a force causes motion. Therefore, since voltage makes current flow in a closed circuit, work is being done. The rate at which this work is done is called the electric power rate, and its measure is the watt—the basic unit of power. Power is equal to the voltage across a circuit, multiplied by the current through the circuit. Using P as the symbol for electrical power, the basic power formula is: $P = IE$ (Equation D). As an example, when E is 2 volts and I is 2 amperes, P becomes 4 watts.	56-61
Power	Explain that when voltage is doubled and resistance remains unchanged, power is doubled twice. This occurs because the doubling of voltage causes a doubling of current (see Equation A), which therefore doubles both of the factors that determine power. In other words, the rate of change of power, in a circuit of fixed resistance, is the square of the change in voltage. Thus the basic power formula $P = IE$ may also be expressed as $P = E^2/R$ (Equation E), or $P = I^2R$ (Equation F). (These equations can easily be derived by simple substitution from Equations A and B.)	62-63
Review Question	The Review Question is, "What does Ohm's Law help determine?" Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	64

Chapter 20 / Section 2: NS2-M3C20S2 – Current

Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	65
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	66

III. Supplemental Activities -

A. In Class Activity:

Supplies required: handout - Currents

When: At the end of the lesson

- Have the cadets write a paragraph answering the following questions: What is the most common source of chemically created electricity? What is the difference between a primary cell and a secondary cell?

B. Take Home Activity: Have the cadets complete the take home activity “Electrical Circuits” which is adapted from <http://www.allaboutcircuits.com>

Answers:

1. Answer should be explained in the Cadet’s own words.

2.



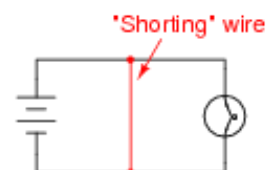
3.



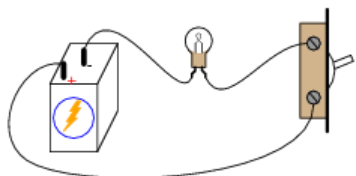
5. A short circuit is a circuit having very little resistance, permitting large amounts of current. If a circuit becomes shorted, it means that a path for current formerly possessing substantial resistance has been bypassed by a path having negligible (almost zero) resistance.

4. These are ground symbols, and they can either refer to connections made to a common conductor (such as the metal chassis of an automobile or circuit enclosure), or the actual earth (usually via metal rods driven into the dirt).

6. In real life, of course, short circuits are usually things to be avoided.



7.



8.

IV. Evaluation - see CPS database for chapter test questions.

Chapter 20 / Section 2: NS2-M3C20S2 – Current

Activity 1: In-Class Activity – Current

Name: _____ Date: _____ Class: _____

What is the most common source of chemically created electricity? What is the difference between a primary cell and a secondary cell?

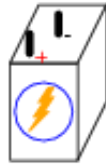
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Chapter 20 / Section 2: NS2-M3C20S2 – Current

Activity 1: Take Home Activity – Electrical Circuits

Name: _____ Date: _____ Class: _____

1. In the simplest terms you can think of, define what an electrical circuit is.
2. Given a battery and a light bulb, show how you would connect these two devices together with wire so as to energize the light bulb:



3. Draw an electrical schematic diagram of a circuit where a battery provides electrical energy to a light bulb.

4. What do the symbols with the question marks next to them refer to? In the circuit shown, would the light bulb be energized?



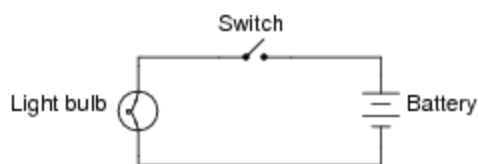
5. What, exactly, is a short circuit? What does it mean if a circuit becomes shorted? How does this differ from an open circuit?

Chapter 20 / Section 2: NS2-M3C20S2 – Current

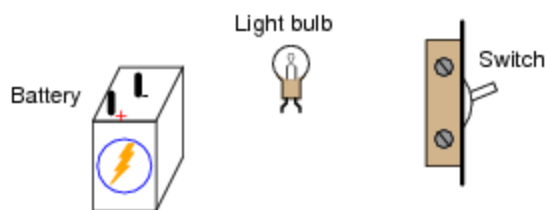
6. What would have to happen in this circuit for it to become shorted? In other words, determine how to make a short circuit using the components shown here:



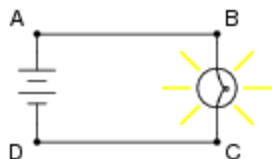
7. Examine this schematic diagram:



Now, without moving the following components, show how they may be connected together with wires to form the same circuit depicted in the schematic diagram above:



8. This circuit has four "test points" labeled with the letters A, B, C, and D. Assuming the circuit is functioning (light bulb is energized), determine whether or not there will be substantial voltage between the following sets of points and circle the correct answer below:



- Between A and B: voltage or no voltage?
- Between B and C: voltage or no voltage?
- Between C and D: voltage or no voltage?
- Between D and A: voltage or no voltage?
- Between A and C: voltage or no voltage?
- Between D and B: voltage or no voltage?

Based on these voltage determinations, what general statement(s) can you make about the presence or absence of voltage in a functioning circuit?

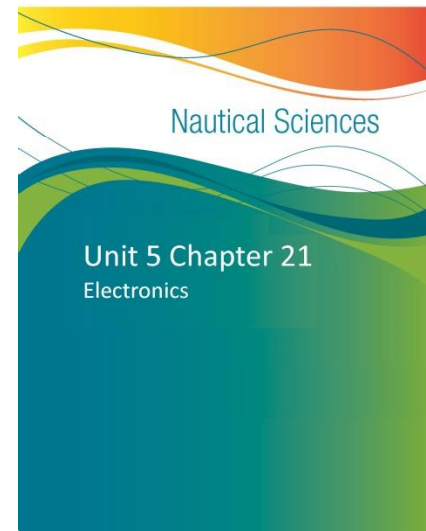
Module 3 Chapter 21: NS2-M3C21 – Electronics

What Students Will Learn to Do:

Demonstrate understanding of Physical Science

Skills and Knowledge to be Gained:

1. Discuss the two kinds of waves by types: Mechanical and Electromagnetic
2. Discuss the four Propagation effects: Refraction, Reflection, Diffraction and Trapping
3. Discuss the principles of radio-frequency wave transmission
4. Describe the principles of radar
5. Describe the use of radar as a navigational aid
6. Describe the use of radar in combat



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Writing

- W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately...
- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks...

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards

Module 3 Chapter 21: NS2-M3C21 – Electronics

Dimension 2. Geography

- D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them.

Next Generation Science Standards (NGSS)

HS.Waves and Electromagnetic Radiation

- HS-PS4-1. Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.
- HS-PS4-5. Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

Chapter 21 / Section 1: NS2-M3C21S1 – Electromagnetic Waves

(Section 1 of 2)

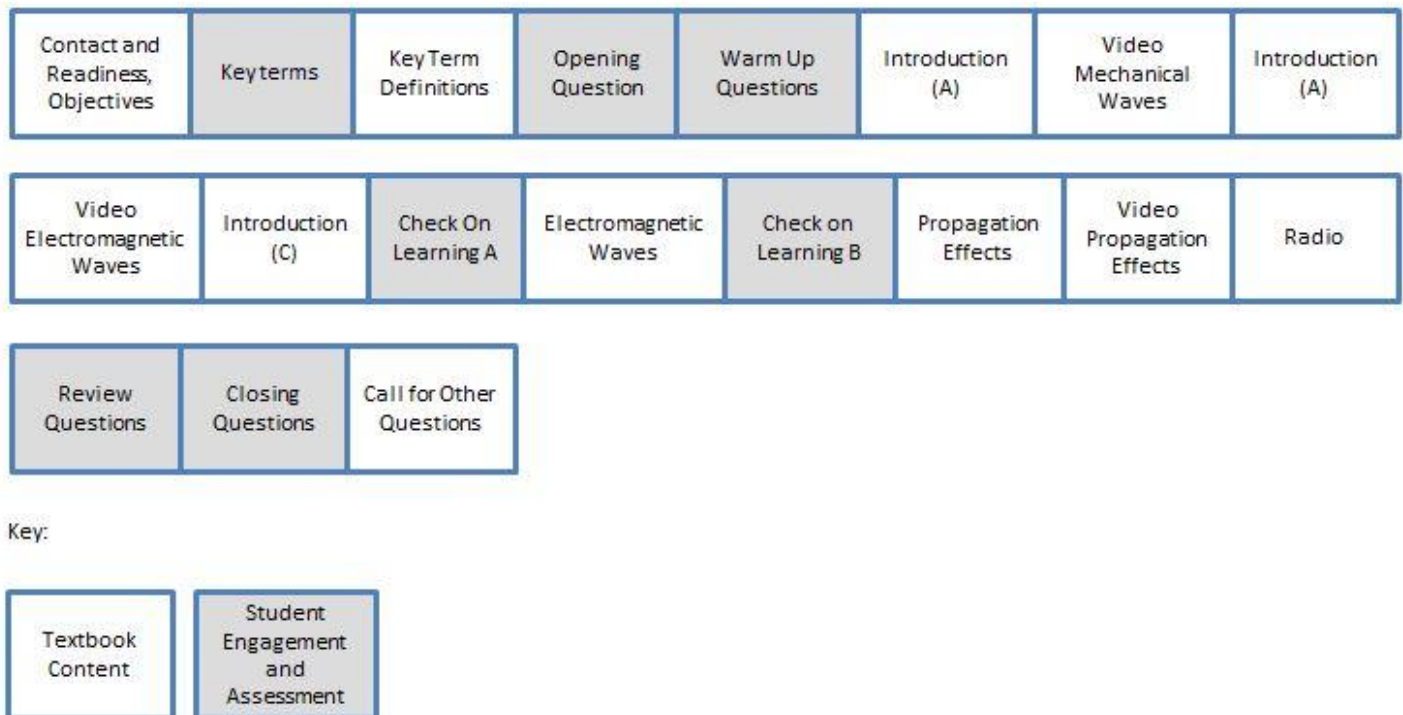
What Students Will Learn to Do:

Demonstrate an understanding of Physical Science

Skills and Knowledge to be Gained:

1. Discuss the two kinds of waves by types: Mechanical and Electromagnetic
2. Discuss the four Propagation effects: Refraction, Reflection, Diffraction and Trapping
3. Discuss the principles of radio-frequency wave transmission

LESSON FLOW OUTLINE



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 21. Place a checkmark beside the NS2-M3C21S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C21S1 - Key Terms and NS2-M3C21S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 21 / Section 1: NS2-M3C21S1 – Electromagnetic Waves

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson will discuss how the Navy uses radar as an everyday tool to accomplish the task. We will discuss the functions of special radar for collecting, processing, displaying, evaluating, and disseminating combat information. We will look into the operations of the Combat Information Center (CIC) and the Combat Direction Center (CDC) and its role on a modern warship.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-12
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Name and describe the two types of waves.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on Electronics.	13
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	14
Introduction	Explain that there are a great many devices used in modern life in general and in the Navy that are based on electricity and the electromagnetic wave. Some of these include the computer, audio equipment of all kinds, radio, television, radar, and sonar. Chapter 3 of this unit covered the subject of basic electricity. In this chapter we will discuss the nature of the electromagnetic wave upon which all of the devices mentioned above are based.	15
Introduction	Explain that in general there are two kinds of waves by type: mechanical and electromagnetic. Mechanical waves require some sort of material in which to travel or propagate (spread). Many of these can be felt and seen. Examples of this type of wave would be water waves through water, sound waves through air, or vibrations along a taut string.	16-17
Video on Mechanical Waves	Show Video on mechanical waves.	18
Introduction	The other type of wave is called electromagnetic, so called because these have both an electrical and a magnetic component. This type of wave is non-material and cannot be	19-21

Chapter 21 / Section 1: NS2-M3C21S1 – Electromagnetic Waves

	directly felt or seen. This type of wave often travels best in a complete vacuum, in which there is no material present. Examples of this kind of wave would be radio, TV, radar, light, and infrared (heat) waves. The material or space through which waves travel is called the medium.	
Video on Electromagnetic Waves	Show Video on electromagnetic waves.	22
Introduction	Explain that regardless of the type of wave, all need to originate from some sort of energy source. Waves can be thought of as nature's means of dissipating energy from this source. They will continue to propagate until the energy level in the surrounding medium is the same as the energy at the source location. There are also two kinds of waves classified by their form. Longitudinal waves cause the medium through which they travel to be displaced back and forth along the path of the wave, like a spring bouncing back and forth. Sound is a wave of this kind. Transverse waves cause the medium to be displaced perpendicular to the direction of travel of the wave in a pattern often called a sine wave. An example of this kind of wave is that produced in a stringed instrument when the string is plucked.	23-28
Introduction	Explain that an electromagnetic wave, because of the methods by which it is propagated, always resembles a sine wave in appearance. The wave can be described by its wavelength, frequency, and amplitude.	29
Introduction	Explain that a cycle is one complete sequence of values of the strength of the wave as it passes through a point in space. The wavelength, abbreviated in electronics by the Greek letter λ (lambda), is the length of a cycle expressed in distance units, usually either meters or centimeters.	30-31
Introduction	Explain that the amplitude is the wave strength at particular points along the wave. It is a measure of the energy contained in the wave. Large amplitude waves convey more energy than do those having small amplitude.	32-33
Introduction	Explain that the frequency, abbreviated as f , is the number of cycles repeated during 1 second of time. If the time frame shown in the figure were 1 second long, for example, it could be said that the frequency of the wave shown is 3 cycles per second. The period, abbreviated by the Greek letter τ (tau) is the time required to complete one cycle of the wave. In the example above, the period would be $1/3$ second. Period and frequency are related by the formula $\tau = 1/f$.	34-35
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	36
Electromagnetic Waves	Explain that all electronic devices use electromagnetic waves as the basis of their operation. Very briefly, an electromagnetic wave is produced by a rapidly expanding and collapsing magnetic field, which is in turn produced by alternately energizing and de-energizing an electronic circuit especially designed to generate such waves. In electronics, such a generating circuit is often referred to as an oscillator. For many applications an amplifier of some type is used to boost the power of the oscillator output, and an antenna is used to form the outgoing wave.	37-39
Electromagnetic Waves	Explain that in the vacuum of space, an electromagnetic wave is theorized to travel at a velocity approaching the speed of light or 3×10^8 meters per second (186,000 miles per second). Frequency and wavelength of an electromagnetic wave are related by the formula $\lambda = 3 \times 10^8 / f$, where λ is the wavelength in meters and f the frequency in cycles per second.	40-42

Chapter 21 / Section 1: NS2-M3C21S1 – Electromagnetic Waves

Electromagnetic Waves	Explain that every specific electromagnetic frequency is radiated at a specific wavelength. In recent years, the term hertz, abbreviated Hz, has come to be used in place of cycles per second, in honor of the German pioneer in electromagnetic radiation, Heinrich Hertz. One hertz is defined as one cycle per second. Frequency is expressed in terms of numbers of thousands (kilo), millions (mega), or billions (giga) of hertz. For example, 10,000 cycles per second is expressed as 10 kilohertz, abbreviated 10 kHz; 2.5 million cycles per second would be 2.5 megahertz, or 2.5 MHz.	43-45
Electromagnetic Waves	Explain that the behavior of an electromagnetic wave is dependent upon its frequency and corresponding wavelength. For descriptive purposes, electromagnetic frequencies can be arranged in ascending order to form a “frequency spectrum” diagram. Electromagnetic waves are classified as audible-frequency waves (20–20,000 Hz) at the lower end of the spectrum, radio waves from about 5 kHz to 30 GHz, and visible light and various kinds of rays at the upper end of the spectrum.	46-48
Electromagnetic Waves	Explain that other types of electromagnetic rays consist of gamma rays, x-rays, ultraviolet rays, infrared rays, short radio waves, and long radio waves.	49
Electromagnetic Waves	Explain that though electromagnetic wave frequencies within the range of 20 to 20,000 Hz are called the audible frequencies, it must be remembered that to be heard such waves must be transformed into mechanical sound waves through devices called speakers.	50
Check on Learning Questions B (Lesson questions 5-6)	Check in on students’ understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	51
Propagation Effects	Explain that the medium through which radio waves travel will affect their path. Weather or atmospheric conditions can cause variation from the straight path that the waves might otherwise take in a vacuum. These variations are called refraction, reflection, diffraction, and trapping.	52-53
Propagation Effects	Explain that refraction (bending) occurs when there is a change in the density or the atmosphere in which the wave is traveling. Take for example a radio wave transiting the atmosphere. Because the atmosphere gradually decreases in density with altitude, the wave is refracted, or bent downward. This increases the horizontal distance the wave will have to travel to get out of the atmosphere.	54-55
Propagation Effects	Explain that refraction also causes bending of radio waves over the horizon. Low frequency waves are bent more readily than high-frequency waves, so low frequency waves are used for long-range radars and long-distance radio communication.	56
Propagation Effects	Explain that radio waves are reflected from the ionosphere, which is generally from 30 to 250 miles above Earth. The distance between the transmitter and the point where the reflected sky wave returns to a ground receiver is called the skip distance.	57-58
Propagation Effects	Explain that diffraction causes spreading of radio waves behind obstructions. It results from the generation of secondary waves by the primary wave.	59
Propagation Effects	Explain that trapping occurs when a temperature inversion in the atmosphere traps cold air close to Earth’s surface. Under those circumstances radio signals may be reflected from the warmer air above back to Earth a number of times. This will increase the range of the transmitted signal. This trapped cold air is called a duct.	60-61

Chapter 21 / Section 1: NS2-M3C21S1 – Electromagnetic Waves

Video on Propagation Effects	Show video on Propagation Effects.	62
Radio	Explain that as mentioned above, radio waves are electromagnetic waves transmitted in the range from about 5 kHz to 30 GHz. On Earth, most of these waves are intentionally generated by electronic devices such as radio and TV transmitters, though some are by-products of other electronic gear. There are also a number of natural radio transmitters, such as interstellar gas and star systems in space. Artificial radio transmissions use a series of electromagnetic waves transmitted at constant frequency and amplitude called continuous waves. Because an unmodified continuous wave cannot convey much information, the wave is normally modified or modulated in some way. When this is done, the basic continuous wave is referred to as a carrier wave.	63-66
Radio	Explain that in practice there are three methods by which a carrier wave may be modulated to convey information. These are amplitude, frequency, and pulse modulation. In amplitude modulation, abbreviated AM, the amplitude of the carrier wave is modified in accordance with the amplitude of a modulating wave, such as voice or music. In the radio receiver the signal is demodulated by removing the modulating wave, which is then amplified and related to the listener by means of a speaker. This type of modulation is widely used in the commercial radio broadcast band, with carrier wave frequencies in the kHz range.	67-70
Radio	Explain that in frequency modulation, abbreviated FM, the frequency of the carrier wave instead of the amplitude is altered in accordance with the frequency of the modulating wave. This type of modulation is used for FM commercial radio broadcasts and the sound portion of television broadcasts, with carrier wave frequencies in the MHz range.	71-73
Radio	Explain that pulse modulation is different from either amplitude or frequency modulation in that there is usually no impressed modulating wave. In this type of modification, the continuous wave is broken up into very short bursts, or “pulses,” separated by relatively long periods of silence during which no wave is transmitted. This is the type of transmission used by most types of radars.	74-75
Radio	Explain that the rapid expansion of electronic digital technology over the last decade gave rise to the need to integrate digital signals into carrier-wave modulation, particularly in applications like cell phones and WiFi. Also, the technique of multiplexing was developed, wherein multiple analog signals and digital data streams are incorporated into a single carrier wave.	76
Radio	Explain that Multiplexing is accomplished via these methods: <ul style="list-style-type: none"> • For analog signals: Transmit the signals on frequencies slightly above and below the carrier-wave frequency. • For digital signals: Embed the signals into the modulation of the carrier wave. The multiplexed signal can then be de-multiplexed by receivers. 	77
Radio	Explain that in the AM and FM radio, digital multiplexing gave rise to HD radio, where digital audio and signals are embedded into the radio signal along with the traditional analog modulation. An HD radio receiver will play or display the digital parts of the transmission, reverting to the basic analog carrier-wave modulation whenever the digital signals cannot be. Music transmitted digitally in this manner is said to rival CD quality.	78

Chapter 21 / Section 1: NS2-M3C21S1 – Electromagnetic Waves

Review Question	The Review Question is, "Describe the following wave attributes: 1) Cycle 2) Wavelength 3) Amplitude 4) Period." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	79
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	80
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	81

III. Supplemental Activities –

A. In Class Activity:

Supplies required: handouts for In Class and Take Home activities

When: Before you discuss waves and after you finish the discussion.

- Have the students form a circle with their right shoulders pointing towards the center. Ask students to design a way for this ring of students to create a transverse wave. (An idea should come up where a student raises her arms and then lowers them, and then the student behind her raises her arms and lowers them, and so on around the circle. It should be like the "wave" in a football stadium).

After the students demonstrate an understanding of the process, ask them what the disturbance in the wave was. (*Answer: Their raised, then lowered, arms were the disturbance.*)

Ask them if the disturbance travels up and down or horizontally around the circle.

(*Answer: up and down*)

Ask them if the wave traveled horizontally around the circle or up and down.

(*Answer: around the circle*) The disturbance oscillating perpendicular to the direction the wave travels is the definition of a transverse wave.

Still standing as in Demo #1, ask the students to describe which direction the disturbance would travel in the ring if the students wanted to make a longitudinal wave. The students should say that the disturbance needs to travel in the same direction as the wave, and around the ring. To make a longitudinal wave, have one student gently tap the back of the student in front of her, and then the pushed student should gently push the student in front of her and so on, this will make a longitudinal wave traveling around the ring.

Ask students: What is the disturbance? (*Answer: the tap*) Is the disturbance traveling up and down or around the ring? (*Answer: around the ring*) Which way does the wave travel? (*Answer: around the ring*) Because this disturbance travels in the same direction as the wave, it is a longitudinal wave.

Have the cadets fill out the handout "Mechanical Waves" and answer the questions.

Answers to the handout:

1. *A traveling disturbance in a medium.*
2. *In a longitudinal wave, the disturbance travels in the same direction as the wave, while in a transverse wave, the disturbance moves perpendicular to the direction of the traveling wave.*

Chapter 21 / Section 1: NS2-M3C21S1 – Electromagnetic Waves

3. *Transverse – Slinky moving up and down, ripple in a pond, “wave” in a stadium.*

Longitudinal – Slinky pushed back and forth, dominoes, ripples in a pond.

B: Take Home Activity – Have the students use the handout electromagnetic waves and fill in the table in order from low to high frequency. Have them put the usages under the correct heading.

Answer:

WAVE:	Radio waves	Microwaves	Infra-Red	Visible Light	Ultra-Violet	X-rays	Gamma Rays
USAGE:	communication	cooking	remote control	laser printer	sun tan bed	airport security	radiotherapy
USAGE:	transmitter	mobile phone	heat lamp	DVD player	hardens dental fillings	brain scans	sterilize medical equipment
USAGE:	radio	radar	security light	weapon aiming system	black lights	radio telescope	sterilize food
USAGE:	television	speed cameras	alarm system	light bulb	security marking pens		

IV. Evaluation - see CPS database for chapter test questions.

Chapter 21 / Section 1: NS2-M3C21S1 – Electromagnetic Waves

Activity1: In Class Activity – Mechanical Waves

Name: _____ Date: _____ Class: _____

Instructions: Complete the following questions.

1) What is a wave?

2) Describe a difference between longitudinal and transverse waves.

3) Give one example of a longitudinal wave and one example of a transverse wave.

Chapter 21 / Section 1: NS2-M3C21S1 – Electromagnetic Waves

Activity1: Take Home Activity – Electromagnetic Waves

Name: _____ Date: _____ Class: _____

Instructions:

1- Put these in Electromagnetic Waves in the correct order in the first row in the table below:

Gamma Rays • Infra-Red • Microwaves • Radio Waves • Ultra-Violet • Visible Light • X-Rays

long wavelength,
low frequency

short wavelength,
high frequency



WAVE:							
USAGE:							
USAGE:							
USAGE:							
USAGE:							

2- Put these usages under the correct wave after you have filled in the top row:

airport security	alarm system	black lights	brain scans
communication	cooking	DVD player	hardens dental fillings
heat lamp	laser printer	light bulb	mobile phone
radar	radio	radio telescope	radiotherapy
remote control	security light	security marking pen	speed camera
sterilize food	sterilize medical equipment	sun tan bed	television
transmitter	weapon aiming system		

Chapter 21 / Section 2: NS2-M3C21S2 – Radio Applications

(Section 2 of 2)

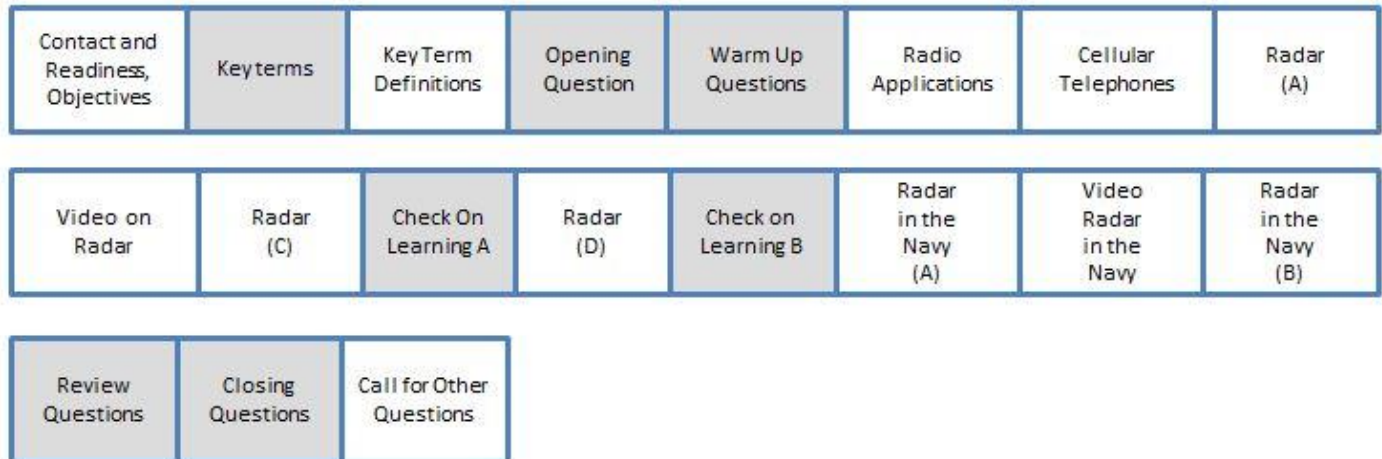
What Students Will Learn to Do:

Demonstrate an understanding of Physical Science

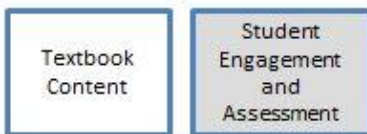
Skills and Knowledge to be Gained:

1. Describe the principles of radar
2. Describe the use of radar as a navigational aid
3. Describe the use of radar in combat

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 21. Place a checkmark beside the NS2-M3C21S2 PowerPoint presentation, and these two CPS question deck files: NS2-M3C21S2 - Key Terms and NS2-M3C21S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 21 / Section 2: NS2-M3C21S2 – Radio Applications

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will discuss how the Navy uses radar as an everyday tool to get the job done. We will discuss the functions of special radar for collecting, processing, displaying, evaluating, and disseminating combat information. We will look into the operations of the Combat Information Center (CIC) and the Combat Direction Center (CDC) and its role on a modern warship.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-12
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Discuss military and consumer uses and applications of radio wave technology.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on radio applications.	13
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	14
Radio Applications	Explain that there are countless applications of radio wave technology in today’s world. Radio-frequency waves are used for commercial ground-based and satellite radio and TV broadcasts, radar, wireless Internet connectivity, and voice and data transmission by all manner of consumer electronic devices, including two-way radios, cellular telephones, and computers.	15
Radio Applications	Explain that other examples of common consumer products that use radio waves include microwave ovens, GPS devices, garage-door openers, and a host of portable electronic devices, like tablets and media players. Household microwave ovens use a standardized radio frequency of 2.4 GHz, well within the lower microwave frequencies, to heat food. Water and fat molecules are particularly sensitive to electromagnetic radiation of this wavelength, readily absorbing energy from it in the form of heat. This is why foods relatively high in water and fat content heat more quickly in these devices, whereas other nonmetallic substances do not. Metals and other electrically conductive materials—especially wire, pointed objects, and crumpled foil—act as antenna within the oven. They quickly absorb the microwave energy and will spark, arc, and burn anything in contact, thus presenting safety hazards.	16

Chapter 21 / Section 2: NS2-M3C21S2 – Radio Applications

Radio Applications	Explain that Military applications of radio include radar; ground and satellite-based communication systems; weapons control systems; drone (U.A.V.) and manned aircraft communications; control, navigation, and landing systems; guided-missile and cruise-missile guidance and control systems; and many constantly emerging new technologies.	17
Cellular Telephones	Explain that one of the most widely used applications of radio technology in the modern world is the cellular telephone, or cell phone. There are an estimated six billion cell-phone users throughout the world today, and cell-phone networks are in operation in virtually every country. Various cell phone models allow for both voice and data transmission, including GPS displays, Internet links, text messages, photographic images and videos, and a wide variety of applications tailored to individual user needs.	18
Cellular Telephones	Explain that in order to communicate with the cellular networks, each cell phone contains a miniaturized low-power transceiver (transmitter and receiver), an antenna, and control circuitry. Two radio frequencies are required for communications between cell phones and the base stations (transmitting towers) within the cellular network. One such station, called the uplink channel, transmits the electromagnetic radio signal from the cell phone to the nearest cell tower. The other, called the downlink channel, transmits signals from the towers to the cell phone.	19
Cellular Telephones	Explain that cell phones are so named because they operate within “cells” of communication established around each base station, which normally consists of a transmission tower and related equipment. In urban areas each base-station tower may have a range of up to a half-mile, while stations in rural and open areas may have ranges of from five to twenty-five miles, depending on the surface topography. Ranges are limited to these relatively short distances so that cell phone transmissions can be done at very low power levels, in order to avoid interference with adjacent cells and to extend the time that cell phones may be used before recharging their batteries. New developments in cell phone system technology, called 4G L.T.E. (described below), are extending these ranges further. Clusters of base stations are connected to base station control centers (B.S.C.’s), which manage the transfer of cell-phone signals from one tower to another as the user moves around within the system.	20
Cellular Telephones	Explain that the B.S.C.’s are in turn connected via either microwave radio or land-line links with mobile switching centers (M.S.C.’s). These interface with the public telephone network infrastructure, which in turn connects with other M.S.C.’s, the land-line telephone system, and the Internet. The M.S.C.’s maintain encrypted data bases containing the last known locations of all active cell phones within their systems, as well as user-authentication and billing information.	21-22
Radar	Explain that radar (short for radio detection and ranging) was developed originally as a means for detecting and ranging on targets in warfare.	23
Video on Radars	Show video on radars.	24
Radar	Explain that radar has also been adapted to an increasing number of other applications ranging from speed detection devices to storm tracking. Radar is based on the principle that electromagnetic waves can be formed into a beam, and that part of waves so transmitted will be reflected back if the wave encounters an object in its path	25-26
Check on Learning Questions A (Lesson questions 3-4)	Check in on students’ understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	27

Chapter 21 / Section 2: NS2-M3C21S2 – Radio Applications

Radar	Explain that Navy radars are grouped in three general categories: search, fire control, and special. Search radars are of two categories: air search and surface search. These are used for early warning and general navigation. Search radars detect targets at maximum range, while sacrificing some detail. Fire control radars are important parts of gun and missile fire control systems. They are used after a target has been located by search radar. Special radars are used for specific purposes, which include ground-controlled approach (G.C.A.) radar at airfields, carrier-controlled approach (C.C.A.) radar, and height-finding radar.	28-31
Radar	Explain that radar operates very much like a sound wave or echo reflection. If you shout in the direction of a cliff, you will hear your shout return from the direction of the cliff. What actually takes place is that the sound waves generated by the shout travel through air until they strike the cliff. There they are reflected, and some return to the originating spot, where you hear them as an echo. There is a time interval between the instant you shout and when you hear the echo. The farther you are away from the cliff, the longer the interval before the echo returns.	32-34
Radar	Explain that the distance to the cliff is proportional to the length of the time interval. If a directional device is built to transmit and receive this echo, it can be used to determine the direction and distance to the cliff, since we know the speed of sound.	35
Radar	Explain that radar equipment works on the same principle. Pulse-modulated radio waves of extremely high frequency are beamed out, and the radar set is programmed to receive its own echo. This out-and-back cycle is repeated up to 4,000 times per second. If the outgoing wave is sent into clear space, no energy is reflected back to the receiver. But if the wave strikes an object—such as an airplane, a ship, a building, or a hill—some of the energy comes back, at the speed of light, as a reflected wave.	36-38
Radar	Explain that in the case of a search radar, the echoes received by the radar receiver appear as marks of light on a cathode ray tube (CRT), a device similar to a TV screen. It is commonly called a “scope” or PPI (plan position indicator). The scope is marked with a scale of yards or meters, miles or kilometers (1,000 meters), and degrees. It provides a bird’s eye view of the area covered by the radar, normally showing the transmitter in the center of the screen. Each time a target is detected it appears as an intensified spot on the scope. Thus an observer watching the PPI can tell the range and bearing to the target. Other radars can tell the altitude of incoming aircraft and missiles.	39-42
Check on Learning Questions B (Lesson questions 5-6)	Check in on students’ understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	43
Radar in the Navy	Explain that radar has many uses in today’s Navy. Surface search and navigational radars are used extensively to assist Navy ships in navigating through constricted waters and during times of poor visibility and stormy weather, as well as tracking other shipping in the area. Air search and height-finding radar is used to track both friendly and potentially threatening aircraft, and fire control radars of various kinds are used to guide shipboard weapons to their targets.	44-47
Video on Radar in the Navy	Show video on radar in the Navy.	48
Radar in the Navy	Explain that the information gathered by most shipboard search radars is presented and analyzed in a shipboard space called the Combat Information Center (C.I.C.); in some more advanced surface warships this space is called the Combat Direction Center, or C.D.C. Quite often on today’s ships during general quarters the commanding officer (C.O.) assumes a battle station in the C.I.C. or C.D.C. and leaves the executive	49-52

Chapter 21 / Section 2: NS2-M3C21S2 – Radio Applications

	officer as the senior officer on the bridge. As the head evaluator of the information coming into the center, the C.O. must decide which targets to engage and with what means—aircraft, guided missiles, or radar-directed gunfire. The C.O. must also decide how to maneuver in order to escape or engage enemy ships, submarines, and aircraft.	
Radar in the Navy	Explain that electronic warfare (E.W.) refers to any action involving the use of the electromagnetic spectrum or directed electromagnetic energy to control the spectrum, attack an enemy, or impede enemy attempts to impede or prevent our own use of the spectrum. It can be conducted from air, sea, land, or space by manned and unmanned systems, and it can target humans, communications, computer networks, radar, or other electronic assets.	53-54
Radar in the Navy	Explain that electronic warfare includes three major subdivisions 1.) Electronic Attack (E.A.) 2.) Electronic Protection (E.P.) 3.) Electronic Warfare Support (E.S.).	55
Radar in the Navy	Explain that electronic warfare (E.W.) uses highly sophisticated electronics to counter the enemy's radiated electromagnetic waves and to ensure the proper and effective use of our own electronic assets. Electronic warfare systems include collection information regarding the enemy without its being aware (passive) and without divulging our presence. Electronic Warfare systems hinder or render the enemy's electronic spectrum useless by jamming circuits with electronic countermeasures (E.C.M.), now referred to as electronic attack (E.A.) measures. Electronic counter countermeasures (E.C.C.M.), is now called electronic protection (E.P.). Electronic Protection ensures the continued use of our electronic spectrum, in spite of enemy attempts to direct E.A. at our forces.	56-58
Review Question	The Review Question is, "Name and discuss the three subdivisions of Electronic Warfare." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	59
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	60
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	61

III. Supplemental Activities -

A. In Class Activity:

Supplies required: handouts for In Class and Take Home activities

When: at the end of the lesson

- Have the cadets complete the handout "U.S. Navy Radar".

B. Take Home Activity: Have the cadets complete the take home handout "Radio Applications".

IV. Evaluation - see CPS database for chapter test questions.

Chapter 21 / Section 2: NS2-M3C21S2 – Radio Applications

Activity 1: In-Class Activity – U.S. Navy Radar

Name: _____ Date: _____ Class: _____

Directions: Answer the following. What are the three general categories of U.S. Navy radars? What are the two categories of search radars and what are they used for? Give examples of how they are used and be prepared to share your answers with the class.

[illegible]

Chapter 21 / Section 2: NS2-M3C21S2 – Radio Applications

Activity1: Take Home Activity – Radio Applications

Name: _____ Date: _____ Class: _____

What are the functions of Electronic Attack (E.A.) and Electronic Protection (E.P.)? List some examples of each.

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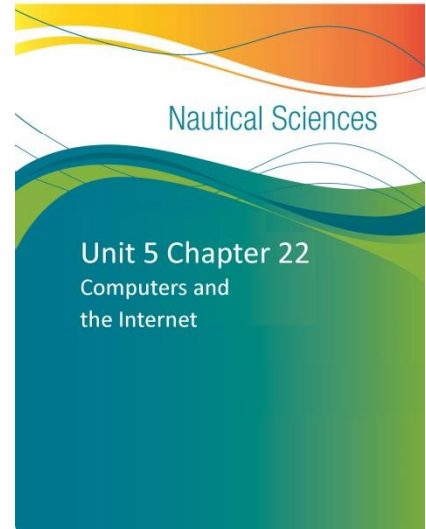
Module 3 Chapter 22: NS2-M3C22 – Computers and the Internet

What Students Will Learn to Do:

Demonstrate understanding of Physical Science

Skills and Knowledge to be Gained:

1. Define the concept of a computer
2. Discuss how modern computers evolved
3. Explain the basics of computer architecture
4. Describe the evolution of the modern internet
5. Describe the attributes of a computer server
6. Explain how the internet is organized, controlled and accessed
7. Explain the concepts of cyberspace and the importance of internet security



Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Writing

- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.9-10.7. Conduct short as well as more sustained research projects to answer a question or solve a problem...
- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking & Listening

- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards**

Dimension 4. Communicating Conclusions and Taking Informed Action

Module 3 Chapter 22: NS2-M3C22 – Computers and the Internet

- D4.2.9-12. Construct explanations using sound reasoning, correct sequence, examples, and details with significant and pertinent information and data...
- D4.6.9-12. Use disciplinary and interdisciplinary lenses to understand the characteristics and causes of local, regional, and global problems....
- D4.7.9-12. Assess options for individual and collective action to address local, regional, and global problems by engaging in self-reflection, strategy identification, and complex causal reasoning.

Next Generation Science Standards (NGSS)

HS.Waves and Electromagnetic Radiation

- HS-PS4-2. Evaluate questions about the advantages of using a digital transmission and storage of information.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 22 / Section 1: NS2-M3C22S1 –Computers and the Internet

(Section 1 of 1)

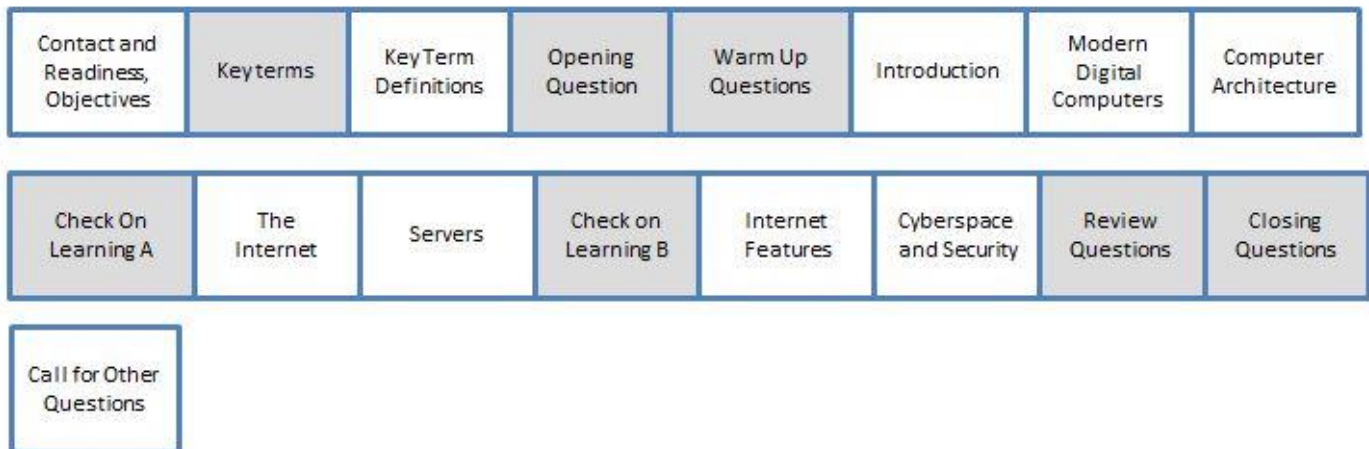
What Students Will Learn to Do:

Demonstrate an understanding of Physical Science

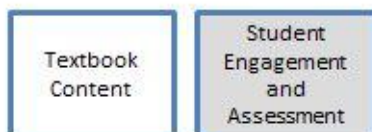
Skills and Knowledge to be Gained:

1. Define the concept of a computer
2. Discuss how modern computers evolved
3. Explain the basics of computer architecture
4. Describe the evolution of the modern internet
5. Describe the attributes of a computer server
6. Explain how the internet is organized, controlled and accessed
7. Explain the concepts of cyberspace and the importance of internet security

LESSON FLOW OUTLINE



Key:



Chapter 22 / Section 1: NS2-M3C22S1 –Computers and the Internet

Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 22. Place a checkmark beside the NS2-M3C22S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C22S1 - Key Terms and NS2-M3C22S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

II. Instructional Flow:

<u>Flow Item</u>	<u>Textbook Content / Student Engagement and Assessment</u>	<u>Slides</u>
Establish contact and readiness; provide lesson overview and objectives review	Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons. In this lesson we will begin a study of computers and the internet. First, we will discuss the architecture and inner workings of the computer. Next we will talk about the creation and of the internet and world wide web along with its features and milestones. Last we will discuss Cyberspace and security.	1-4
Key terms - CPS	Ask students to respond to the C.P.S. questions covering each key term.	5
Key terms - Definitions	Reinforce the correct definition for each key term.	6-20
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “How do you think computers all over the world connect via the internet?” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on computers and the Internet.	21
Warm-Up Questions(Lesson questions 1-2)	Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions. Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.	22
Introduction	Explain that a computer is a device that can carry out a finite set of arithmetical or logical operations. The electronic digital computer, the most common type of modern computer, consists of at least one processing element, called a central processing unit (C.P.U.), and some form of memory. It may have additional internal components, such as modems for communication or secondary memory for data storage. Peripheral devices (external components attached to the computer	23

Chapter 22 / Section 1: NS2-M3C22S1 –Computers and the Internet

	wirelessly or with cables) enable information to be input or output, stored, retrieved, transmitted, displayed, or printed.	
Introduction	Explain that the first electronic digital computers were developed in the United Kingdom and the United States in the early 1940s. They were made of vacuum tubes, were about the size of a small room, and consumed vastly more power than modern computers. Since the advent of the digital computer, constant advances in solid state electronics technology have made possible corresponding advances in architecture, size, and operation, to the point where modern computers bear little resemblance to the early prototypes.	24
Modern Digital Computers	Explain that modern digital computers are based on integrated circuits (a set of electronic components connected by ultrathin conductors printed on small silicon wafers called chips). Several chips may be combined with other electronic components on a printed circuit board, groups of which make up the various components of the computer. These chips are millions of times faster and more capable than the first vacuum-tube computers built in the 1940s.	25
Modern Digital Computers	Explain that common uses range from information processing, computation, social networking, and communication using small desktop personal computers (PCs) and portable laptop computers to large applications, such as corporate and government accounting, transaction processing, and high-capacity data processing, using large, immobile computers called main frames. In industry, computers are widely used to control all manner of manufacturing processes, and electrical grids rely on them to control and regulate the production and transmission of electrical power. They are integral parts of almost all motor vehicles, airplanes, and ships. Computers are also used as components in consumer electronic devices, such as smartphones, tablets, digital music players, and GPS units. Computers can communicate with one another and be linked together via specially designed computer data networks and the Internet.	26
Modern Digital Computers	Explain that individuals operate computers by means of user-friendly operating system programs, such as Microsoft Windows and Apple Mac OS that control applications and continuously monitor all critical computer systems and functions. Programming that controls computers and their processes and enables them to perform tasks is collectively called software, and all physical components of computers and devices attached to them that carry out the programming are collectively referred to as hardware.	27
Computer Architecture	Explain that electronic digital computers are designed to perform computations and store data on the basis of the binary number system, wherein all numbers are represented as powers of two, using only the digits 0 and 1. In computers this corresponds to processing and storage elements that have either no charge (0) or some charge (1), or in some cases, two different standard charges. Computers perform these discrete binary computations millions, even billions of times per second using groups of eight such binary numbers, called bytes (B). Each byte is therefore able to represent 28 or 256 different numbers. To represent larger numbers, several consecutive bytes may be used. Fractions are represented by fractional powers of two (represented digitally) and negative numbers by an auxiliary data bit.	28
Computer Architecture	Explain that all keyboard functions, such as spacing, and data, or letters, special characters and multimedia objects (images, video and sound recordings), and color hues are linked, or coded, to unique combinations of these numbers. A single function or character might take a single byte to encode, while other data may take multiple bytes. Standards for this coding include ASCII (American Standard Code for	29

Chapter 22 / Section 1: NS2-M3C22S1 –Computers and the Internet

	Information Interchange) for keyboard functions and characters, JPEG (Joint Photographic Experts Group) for images, and MPEG (Moving Picture Experts Group) for video.	
Computer Architecture	Explain that digital computers are rated according to their computational speed and memory capacity. Computer speed is expressed as the number of computational cycles that the computer's CPU can perform per second, expressed in Hertz (Hz). Early computers operated in the kilohertz (KHz) range (thousands of cycles per second), but over time computational speeds increased into the millions (MHz) and later billions (GHz) of cycles per second. Computer memory capacity is expressed in multiples of the number of bytes that can be stored. Early computer memories were limited to a few thousand bytes (kilobytes, KB), but over time memory capacities increased exponentially into the millions (megabytes, MB), billions (gigabytes, GB), and trillions (terabytes, TB) of bytes.	30
Computer Architecture	Explain that the internal, or main, memory of a digital computer is accessed directly by the CPU and is located close to it so as to minimize data-transmission time. Memories are made up of a large number of microscopic semiconductor cells called random access memory (RAM). Computers also have secondary memories, in which much larger quantities of data may be stored, usually in the form of devices called hard drives. For many years hard drives contained rapidly rotating discs coated with magnetic material so their data would not be lost when the computer was powered down. More recent hard-drive technology is based on solid-state memory that does not use rotating discs. Solid-state memory allows for faster access, creates less heat, and is more durable than traditional spinning hard drives. Main-memory access times are measured in nanoseconds (billionths of a second), whereas secondary memory speeds were traditionally measured in milliseconds (thousandths of a second).	31
Computer Architecture	Explain that computers interface with the external world by means of input/output devices called peripherals. These include such hardware as the keyboard and computer mouse, monitors, printers, microphones and speakers, cameras, and auxiliary storage media, such as CD and DVD drives. Almost all peripherals can now be connected to the computer either by cables or wirelessly. They interface with the computer through software called device drivers that act as translators between the peripheral devices and the applications or operating-systems programming that use them.	32
Computer Architecture	Explain that in addition to electronic digital computers, there is another type of computer, called an analog computer. Analog computers are called that because they can simulate mathematical calculations or the physical behavior of mechanical systems by analogous current or fluid flow through a properly designed array of components, or gear rotations, or scale manipulations. Analog computers were once widely used as thermostats, for process control, military aircraft bombsights, and large-caliber Naval gunfire control and torpedo solutions on surface warships and submarines. Math calculations done by students, engineers, and scientists were done using linear or circular slide rules. The superior capabilities of modern digital computers, controllers, and electronic calculators in all these applications have reduced present-day analog computer use to a few specialized needs.	33
Computer Architecture	Explain that as in the civilian world, computers are extensively used in the Navy and Marine Corps for a wide variety of applications both ashore and afloat. They are integral parts of almost every major shipboard system and enable instant communications between sailors at sea, Marines on deployment, and their families at home. They are also used for many applications in Naval aircraft, cruise missiles, and guided munitions of all kinds.	34

Chapter 22 / Section 1: NS2-M3C22S1 –Computers and the Internet

Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	35
The Internet	Explain that although some attempts were made in the 1950s to link computers together after their prototypes were developed a decade earlier, the birth of the modern Internet occurred in the 1960s with work funded by the Defense Advanced Research Projects Agency (D.A.R.P.A.). D.A.R.P.A.'s efforts led to the development of the first computer network, intended to facilitate communication and research among various federal government agencies and contractors. It was called the A.R.P.A.N.E.T. By the end of 1969, there were four host computers linked together in the fledgling network. It grew to hundreds of linked computers a few years later.	36
The Internet	Explain that though originally restricted to Department of Defense users, soon the A.R.P.A.N.E.T.'s usefulness convinced many other potential user communities to build additional networks, wherever funding could be obtained for the purpose. Soon the need for a standardized system of network operating procedures to link various networks together became obvious. By the late 1970's, the first such network standards had been developed and implemented, under the leadership of D.A.R.P.A. Electronic mail (e-mail) was standardized and led to establishment of Domain Names system (D.N.S.) in 1983.	37
The Internet	Explain that the D.N.S. is a standardized system of addresses wherein various types of information, or domains, are associated with multi-level domain names assigned to the various entities, such as individual computers, servers (described below), or websites (network locations where information is stored) that support them.	38
The Internet	Explain that domain names provide easy human-friendly linkage to corresponding thirty-two-bit numerical Internet Protocol (IP) addresses needed by computers to identify and access interconnected computers and other entities and devices on the network worldwide. Examples of top-level domain names most commonly used in the United States are <i>gov</i> , <i>edu</i> , <i>com</i> , <i>mil</i> , <i>org</i> , and <i>net</i> ; there are currently about fifteen others as well. In late 2013 it was announced that over the next few years some 1,400 new "strings" (names) of various lengths would be added, some them in Arabic, Cyrillic, and Chinese. For communications between users in different countries, there are also some 250 top-level two-letter country codes, such as <i>uk</i> for the United Kingdom and <i>fr</i> for France. Lower-level domain names fall to the left of the "dot".	39
The Internet	Explain that as the number of interlinked computer systems continued to grow in the mid-1980's, facilitated by such standardization as the domain-name system, the term Internet came into common usage as an abbreviation of the term "internetworking," which had been used up to that point for such networks. In the late 1980s the term World Wide Web (www) was coined by a contractor at the C.E.R.N. atomic research facility in Switzerland. It subsequently became the prefix for all Internet addresses and has often come to be used as a synonym for the Internet itself, though the web is actually a service that operates over the Internet, like e-mail. The underlying set of standard procedures by which the World Wide Web operates is called the Hyper Text Transfer Protocol (http). This protocol defines how transmissions on the Internet are formatted and transmitted and what actions web servers and search programs (described below) should take in response to various user commands. The letters " <i>http</i> " or " <i>https</i> " precede all Internet website addresses accessed by Internet users, with the latter designation used for secure sites.	40-41
Servers	Explain that a server is a system of software run on one or more linked computers to provide a resource to a user on a computer network and/or the Internet. They may	42

Chapter 22 / Section 1: NS2-M3C22S1 –Computers and the Internet

	serve limited users within a large organization, such as a government department, or general-public users via the Internet. There are database servers, e-mail servers, web servers, and gaming servers, among many others.	
Servers	Explain that any computer may function as a server, but those supporting large networks and the Internet are typically main-frame computers with features such as faster CPUs, huge memory capacities, multiple hard drives, and redundant power supplies. Like other network components, each server is given a numerical IP address that allows it to be accessed by any qualified user.	43
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	44
Internet Features	Explain that a major milestone for the Internet was the development of the browser, a software tool used to locate information on the web. Rudimentary browsers were developed in the 1980's, but the first of the more capable browsers that popularized the World Wide Web was developed in 1993 by a computer- applications group at the University of Illinois. It formed the basis for more sophisticated browsers and modern search engines (computer-based software designed to facilitate keyword Internet searches) developed commercially by Netscape, Microsoft Corporation, and others in the years since.	45
Internet Features	Explain that a second major milestone for the Internet in the mid-1990's was the formation of commercial companies, called Internet Service Providers (ISPs) that facilitated consumer access to the Internet. They provided access at first via standard telephone lines, and later by high-speed service via telephone lines or TV cable or broadband wireless transmission, described below. A key service of ISPs is to assign email addresses to their clients and to provide e-mail mailbox hosting services for them, via servers that send, receive, accept, and store their e-mails. ISPs also enable clients to use various commercially available browsers and search engines to research and access whatever information they might desire and to enable such services as webcasting (broadcasts delivered via the Internet), Internet-based voice and video telephone service, and instant messaging (IM).	46
Internet Features	Explain that a more recent milestone for Internet technology with great promise for the future is the increasing use of so-called cloud computing, wherein application programming and data is stored on a number of remote sites accessible via the Internet and referred to as "the cloud," as opposed to on a user's own device. This greatly increases the capabilities of these devices while decreasing their cost and making better more efficient use of available Internet resources.	47
Internet Features	Explain that connectivity to the Internet may be done in a variety of ways and using a number of different types of devices, ranging from personal and lap-top computers to cell phones and tablets. Methods of connection include traditional telephone lines (dial-up and DSL), dedicated hard-wired lines (e.g., Ethernet), television coaxial cable service, and wireless radio (WiFi) transmission. Dial-up telephone allows only narrowband transmission, versus broadband in the case of DSL (Digital Subscriber Line) and the other three.	48
Internet Features	Explain that the term broadband refers to the simultaneous use of a broad range of carrier-wave frequencies with bandwidths of 6 MHz. This allows at least 1.5 megabits (1.5 million bits) of information or higher to be transmitted each second, as opposed to a maximum of 56 kilobits (56 thousand bits) per second for narrowband dial-up telephone, which uses a single carrier-wave frequency with a bandwidth of only 3 kHz. Modern- day fourth-generation (4G) WiFi (Wireless Fidelity) peak download rates are as high as 1 gigabits (1 billion bits) per second. Thus, a modern 4G WiFi	49-50

Chapter 22 / Section 1: NS2-M3C22S1 –Computers and the Internet

	system can transmit about 18,000 times more bits per second than traditional voice telephone service, although for data the download rates are typically much slower. A recent technology upgrade to 4G networks called LTE (Long Term Evolution) achieves increased data upload and download speeds through use of new digital signal processing (DSP) technology.	
Internet Features	Explain that the Internet itself has no formal international governing or regulating body. Each of the various computer networks that make it up sets its own policies, with guidance and regulation by the various countries in which they are located. The only restriction is that each network must conform to the established Internet Protocol address and domain-name systems. It is estimated that over a third of the world's current population of seven billion now makes use of the Internet, an amazing increase from the few thousands of mostly scientific and military users at its beginnings in the early 1990's. Satellite-based communication systems facilitate its use worldwide and by American military personnel wherever they may be on land, at sea, and in the air. Its use has even been extended into near- Earth space, with the installation of Internet links aboard the International Space Station in 2010.	51-52
Internet Features	Explain that information technology (IT) refers to anything related to computing or networking technology, such as hardware, software, the Internet, or the people who work in these fields. Most government agencies and many private companies have IT departments for managing and supporting the computer and networking facilities within their organizations.	53
Cyberspace and Security	Explain that the sum total of all the world's computers, servers, and networks Inter-connecting these is called cyberspace. Despite all the advances in communication and dissemination of knowledge and scientific advances made possible for legitimate users of cyberspace, there are unfortunately, those who would try to do damage to it or use it for illegal gain. Individuals who engage in this kind of illegitimate activity are called hackers. Sometimes they attempt to break into various kinds of financial networks to steal personal information (called identity theft) or divert funds for illicit personal gain, or into corporate, industrial, or government systems to conduct espionage (spying). Others try to infect various systems with "glitch" programs called viruses that partially or completely impair the systems or the computers in them. Such attempts by extremists or terrorists in furtherance of their objectives are called cyber terrorism. If done by foreign governments or other foreign entities on a large scale, these attacks are called cyber warfare.	54-56
Cyberspace and Security	Explain that countermeasures against this activity, including, but not limited to such measures as data encryption, antivirus programming, and firewalling (isolating sensitive data and programming from outside interactions) is called cyber security. There are a number of both government and private organizations that are engaged in this endeavor. They include the U.S. Cyber Command for military applications, and for other user communities the Department of Homeland Security, federal, state, and local law enforcement agencies, and a number of corporate and industrial groups and commercial firms. The U.S. Cyber Command has components within each of the military services.	57
Review Question	The Review Question is, "Identify and describe the major advances in computer technology that you think will be in place by the year 2100." Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students' best responses for visual reinforcement, and to foster discussion.	58

Chapter 22 / Section 1: NS2-M3C22S1 –Computers and the Internet

Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	59
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	60

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handouts for In Class and Take Home Activities.

When: at the end of the lesson after discussing security.

- As a class, discuss when creating a password, what makes it strong? Together make a list of password do's and don'ts. Using the handout "Passwords", have the cadets make a list of 25 of the worst passwords of all time.

B. Take Home Activity: Have the cadets use the handout "Social Networking" and answer the questions:

- What is social networking?
- What is it used for?
- How secure (private or subject to unintended viewing) is it?
- List some guidelines (do's and don'ts) for using social media?

IV. Evaluation - see CPS database for chapter test questions.

Chapter 22 / Section 1: NS2-M3C22S1 –Computers and the Internet

Activity1: In Class Activity – Passwords

Name: _____ Date: _____ Class: _____

Make a list of the 25 worst passwords of all time

- | | |
|-----------|-----------|
| 1. _____ | 2. _____ |
| 3. _____ | 4. _____ |
| 5. _____ | 6. _____ |
| 7. _____ | 8. _____ |
| 9. _____ | 10. _____ |
| 11. _____ | 12. _____ |
| 13. _____ | 14. _____ |
| 15. _____ | 16. _____ |
| 17. _____ | 18. _____ |
| 19. _____ | 20. _____ |
| 21. _____ | 22. _____ |
| 23. _____ | 24. _____ |
| 25. _____ | |

Chapter 22 / Section 1: NS2-M3C22S1 –Computers and the Internet

Activity1: Take Home Activity – Social Networking

Name: _____ Date: _____ Class: _____

Directions: Answer the questions and complete the table.

1. What is social networking?
2. What is it used for?
3. How secure (private or subject to unintended viewing) is social networking?
4. List guidelines for social media.

DO'S for SOCIAL MEDIA	DON'TS for SOCIAL MEDIA

Module 3 Chapter 23: NS2-M3C23 – Sound and Sonar

What Students Will Learn to Do:

Demonstrate understanding of Physical Science

Skills and Knowledge to be Gained:

1. Explain the effects that density and temperature have on sound
2. Explain how the ear detects sound
3. Describe the Doppler shift
4. Explain the characteristics of sound in seawater
5. Describe sonar and its characteristics

Linked Standards in this Chapter:

Common Core English Language Arts 9-10*

Reading: Informational Text

- RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly...

Writing

- W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.9-10.7. Conduct short as well as more sustained research projects to answer a question or solve a problem...
- W.9-10.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking & Listening

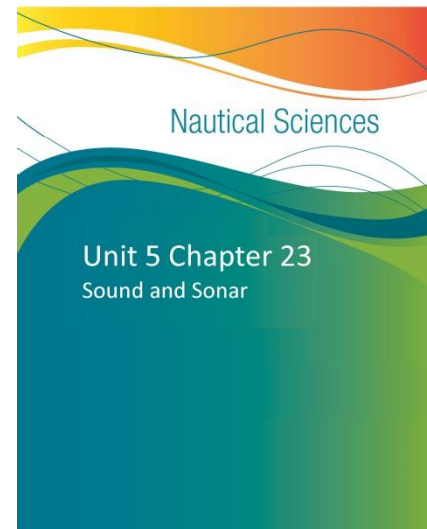
- SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions...
- SL.9-10.6. Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

Language

- L.9-10.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and...
- L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases...

National Health Education Standards (NHES)**

- NHES Standard 1: Students will comprehend concepts related to health promotion and disease prevention to enhance health.



Module 3 Chapter 23: NS2-M3C23 – Sound and Sonar

- NHES Standard 3: Students will demonstrate the ability to access valid information, products, and services to enhance health.
- NHES Standard 5: Students will demonstrate the ability to use decision-making skills to enhance health.

College, Career, and Civic Life (C3) – Frameworks for Social Studies State Standards***

Dimension 2. Geography

- D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them.

Dimension 4. Communicating Conclusions and Taking Informed Action

- D4.2.9-12. Construct explanations using sound reasoning, correct sequence, examples, and details with significant and pertinent information and data...
- D4.7.9-12. Assess options for individual and collective action to address local, regional, and global problems by engaging in self-reflection, strategy identification, and complex causal reasoning.

Next Generation Science Standards (NGSS)

HS.Waves and Electromagnetic Radiation

- HS-PS4-1. Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.
- HS-PS4-5. Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.

*A complete listing of all linked grades 9-10 Common Core English Language Arts Standards and their indicators associated with this Chapter are displayed on the Standards Chapter Matrix – ELA at the end of the Naval Science 2 Instructor's Guide.

**A complete listing of all linked National Health Education Standards (NHES) associated with this Chapter are displayed on the Standards Chapter Matrix – NHES located at the end of the Naval Science 2 Instructor's Guide.

***A complete listing of all linked College, Career, and Civic Life (3) – Framework for Social Studies Standards associated with this Chapter are displayed on the Standards Chapter Matrix – C3 Framework for SS Standards located at the end of the Naval Science 2 Instructor's Guide.

Chapter 23 / Section 1: NS2-M3C23S1 – The Essence of Sound

(Section 1 of 2)

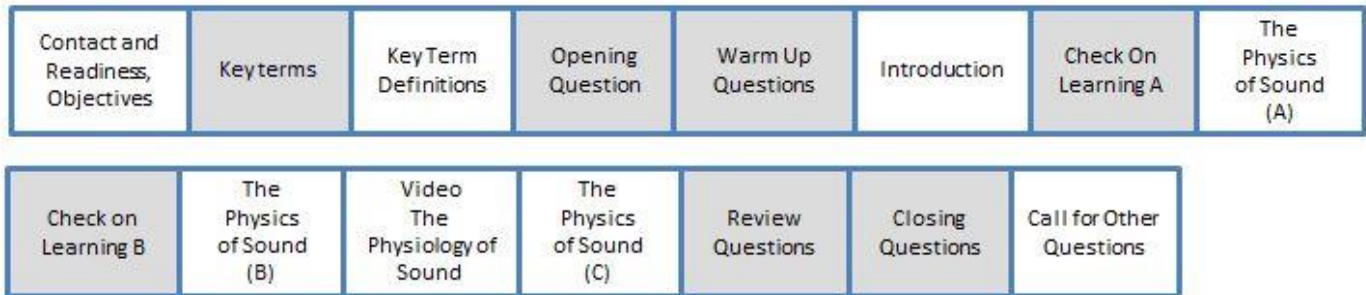
What Students Will Learn to Do:

Demonstrate an understanding of Physical Science

Skills and Knowledge to be Gained:

1. Explain the effects that density and temperature have on sound
2. Explain how the ear detects sound

LESSON FLOW OUTLINE



Key:



Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, Chapter 23. Place a checkmark beside the NS2-M3C23S1 PowerPoint presentation, and these two CPS question deck files: NS2-M3C23S1 - Key Terms and NS2-M3C23S1 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 23 / Section 1: NS2-M3C23S1 – The Essence of Sound

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson we will learn about the physics and physiology of sound. Sound is classified as a material wave. It is the sensation produced by stimulation of the organs of hearing by vibrations transmitted through the air or other medium. We will discuss how the ear detects sound because without a human ear to hear a sound wave, there would be only noise and no sound.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-6
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Discuss how frequency of a sound wave determines what the human ear can hear.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing on sounds and sonar.	7
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	8
Introduction	Explain that energy can take different forms. Classified by type, these are material and electromagnetic waves. Sound is a material wave. Like all waves, it originates at a source of energy, which, in the case of sound, causes matter to vibrate. These vibrations are passed along into the material surrounding the source—the medium—in the form of a series of longitudinal (in the direction of travel) pressure waves. Each wave carries with it a certain amount of energy imparted to it by the source as it vibrates.	9-12
Introduction	Explain that once started, if the medium through which it travels is of uniform temperature and density, the individual waves spread through the medium in the form of expanding three-dimensional spheres, much like ripples expanding over a two-dimensional water surface from the point of impact of a stone. Because the available energy in the wave is spread over an ever-increasing area as each sphere expands, with the area of a sphere being $4\pi r^2$, the energy per unit area falls off rapidly as the distance (the radius r) from the sound source increases. Sound intensity is expressed in terms of watts per square centimeter or per square meter.	13-14

Chapter 23 / Section 1: NS2-M3C23S1 – The Essence of Sound

Introduction	Explain that in order for a human to hear a sound, it must hit the eardrum with an intensity of at least 10–12 watts per square meter. Anything less will not deflect the eardrum sufficiently for the sound to be heard.	15-16
Introduction	Explain that a human's ability to hear a sound also depends on the frequency of the sound, or the number of times per second that a sound wave passes by. As was stated in chapter 4 of this unit, the audible frequency range for the human ear is 20 to 20,000 Hz. Sounds in the extreme high and low ends of this frequency range require more power per unit area to be heard than do sounds in the mid-range.	17-19
Check on Learning Questions A (Lesson questions 3-4)	Check in on students' understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	20
The Physics of Sound	Explain that because sound is a material wave, it stands to reason that the more material there is per unit volume in the medium, the better sound will travel through it. Because of the increase in molecular motion within a material as temperature increases, temperature of the medium also affects sound transmission. Sound travels better within a given material if its temperature is higher as opposed to when its temperature is lower.	21-23
The Physics of Sound	<p>Material Speed of sound (m/sec)</p> <ul style="list-style-type: none"> • Air at 0 degrees C 332 • Air at 20 degrees C 344 • Air at 100 degrees C 392 • Kerosene at 25 degrees C 1,324 • Water at 25 degrees C 1,498 • Wood (oak) 3,850 • Steel 5,200 	24
The Physics of Sound	Explain that sound waves have the same general behavior as other types of waves. They can be reflected by media having a greater density than the medium in which they originate. For example, when a sound wave traveling through air hits the wall of a room, the reflected sound is called an echo. Sound waves can also be bent or refracted as they pass from one medium to another, if the densities are not too dissimilar. Sound waves can also be diffracted, spreading after they pass through a narrow opening.	25-29
The Physics of Sound	Explain that sound waves obey the formula $v = f\lambda$ where v is the velocity of the wave, f its frequency, and λ is the wavelength. Thus, if we know the speed of sound for a given medium, and either the frequency or wavelength, we can easily calculate the unknown quantity.	30
The Physics of Sound	Explain that when a sound wave is reflected from an object creating an echo, one can easily compute the distance to the object if the speed of sound in the medium containing it is known, using the simple formula Distance = rate x time. For example, if the speed of sound in air were 344 m/s, and it took 4 seconds for an echo to return to a source, then the one-way distance would be $(4 \text{ sec} \div 2) \times 344 \text{ m/s} = 688$ meters.	31
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	32

Chapter 23 / Section 1: NS2-M3C23S1 – The Essence of Sound

The Physics of Sound	Explain that besides specifying the intensity of a sound in terms of its power per unit area, as described above, there is another widely used measure of sound intensity relative to the quietest sound the ear can hear. This measure, called relative intensity or noise level, is calculated in units called decibels. A sound having 0 decibels is equal in intensity to the lowest that can be heard, 10^{-12} watts per square meter. On the decibel scale a sound of 100 decibels would be 10^{10} times as intense as a sound of 0 decibels. A sound of 120 decibels is the loudest sound that the ear can withstand without pain, as the eardrum begins to tear with anything greater. Negative sound decibel levels indicate a sound that is too faint to be heard without amplification, as for example, distant fish sounds in the ocean.	33-35
The Physics of Sound	Explain that without a human ear to hear a sound wave there would be no sound, only noise. The sound waves are gathered and funneled by the outer ear into an opening through the skull called the ear canal. At the inner end of the ear canal is a very thin sensitive membrane called the eardrum. Its extreme sensitivity is indicated by the fact that it can detect sound intensities of 10^{-12} watts per square meter, equivalent to a pressure of only 2×10^{-5} newtons (the metric unit of force) per square meter! It is obvious that you should be very careful to protect your eardrums from loud or highly focused sound, such as the sound produced by highly amplified music or earphones.	36-39
The Physics of Sound	Explain that beyond the eardrum is the middle ear. Here three delicate bones called the hammer, anvil and stirrup transmit the sound from the eardrum to the inner ear.	40
Video on the Physiology of Sound	Show video on the physiology of sound.	41
The Physics of Sound	Explain that the inner ear is where a liquid-filled structure called the cochlea is located. Sound vibrations in the liquid are sensed by special cells that translate the mechanical vibrations to electromagnetic nerve impulses. These impulses travel through the auditory nerve to the brain, where the person interprets them as sound.	42
The Physics of Sound	Explain that some animals such as bats or dogs have ears that are sensitive to sounds above the 20,000-Hz upper frequency limit that humans can hear. Sounds in this region are called ultrasound. Bats use these high intensities to navigate by means of echoes returned from objects around them, and dog owners may use ultrasonic dog whistles to call their pets.	43-45
Review Question	The Review Question is, “Why should people be careful to protect their eardrums against loud sounds?” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	46
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	47
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	48

Chapter 23 / Section 1: NS2-M3C23S1 – The Essence of Sound

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handout for In Class and Take Home activities

When: Anytime during or after the lesson.

- Using the handout “Sounds”, have the cadets write a paragraph answering the questions: Why should people be careful to protect their eardrums against loud sounds? What devices can be used to protect your hearing from loud noises? What precautions should you take when using ear buds or head phones? Why?

B. Take Home Activity: Have the cadets use the handout called ‘Decibels’ and use the line diagram to show a range of decibels and identify events or characteristics of sound at key decibel levels. For example: 0 decibels should be labeled as equal to the lowest intensity that can be heard. In the same way, 120 decibels is loudest sound that the ear can hear without pain. List the decibel levels of several common noises such as jet engines, music concert, car engines, fire crackers, a Seattle Seahawks home football game, etc.

IV. Evaluation - see CPS database for Chapter test questions.

Chapter 23 / Section 1: NS2-M3C23S1 – The Essence of Sound

Activity 1: In-Class Activity: Sounds

Name: _____ Date: _____ Class: _____

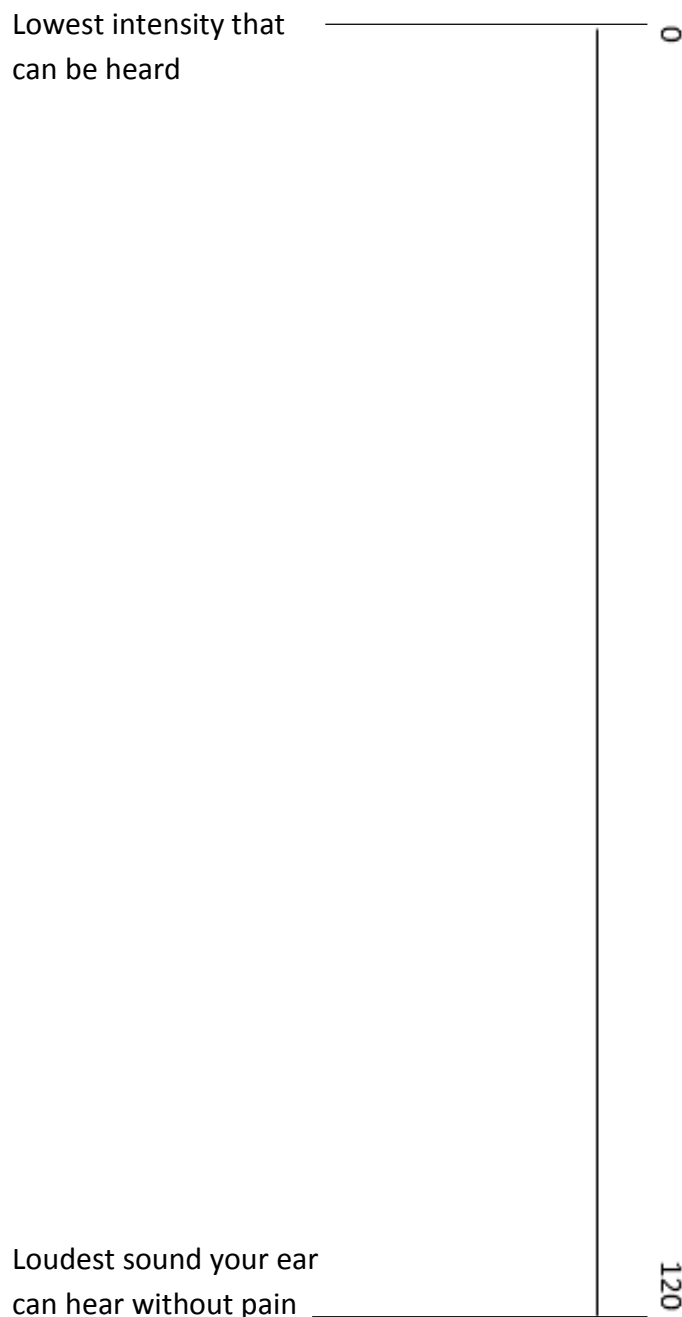
Directions: Write a paragraph answering the questions: Why should people be careful to protect their eardrums against loud sounds? What devices can be used to protect your hearing from loud noises? What precautions should you take when using ear buds or head phones? Why?

Chapter 23 / Section 1: NS2-M3C23S1 – The Essence of Sound

Activity 1: Take Home Activity: Decibels

Name: _____ Date: _____ Class: _____

Directions: Draw a line diagram showing a range of decibels and identify events or characteristics of sound at key decibel levels. 0 decibels should be labeled as equal to the lowest intensity that can be heard. 120 decibels is loudest sound that the ear can hear without pain. List the decibel levels of several common noises such as jet engines, music concert, car engines, fire crackers, a Seattle Seahawks home football game, etc.



Chapter 23 / Section: NS2-M3C23S2 – The Doppler Shift

(Section 2 of 2)

What Students Will Learn to Do:

Demonstrate an understanding of Physical Science

Skills and Knowledge to be Gained:

1. Describe the Doppler shift
2. Explain the characteristics of sound in seawater
3. Describe sonar and its characteristics

LESSON FLOW OUTLINE

Contact and Readiness, Objectives	Keyterms	Key Term Definitions	Opening Question	Warm Up Questions	The Doppler Shift (A)	Video The Doppler Shift	The Doppler Shift (B)
Sound in the Sea (A)	Check On Learning A	Sonar (A)	Check on Learning B	Sonar (B)	Review Questions	Closing Questions	Call for Other Questions

Key:

Textbook Content	Student Engagement and Assessment
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Outline of Instruction:

I. Preparation:

- Open CPS database, and expand folders until you see Module 3, chapter 23. Place a checkmark beside the NS2-M3C23S2 PowerPoint presentation, and these two CPS question deck files: NS2-M3C23S2 - Key Terms and NS2-M3C23S2 - Lesson Questions.
- Ensure that every student has a functional CPS response pad and a textbook.

Chapter 23 / Section: NS2-M3C23S2 – The Doppler Shift

II. Instructional Flow:

Flow Item	Textbook Content / Student Engagement and Assessment	Slides
Establish contact and readiness; provide lesson overview and objectives review	<p>Motivate students by relating real or imaginary events to help them see what the lesson will involve. Explain how this lesson ties in with other lessons.</p> <p>In this lesson, we will discuss how we all have noticed the apparent change in frequency of pitch of a train whistle as it approaches, passes, and then departs. The phenomenon is known as the Doppler effect. We will discuss the Doppler shift. We will spend time discussing the physics of sound at sea. We will discuss the characteristics of sound in seawater and see how sonar technicians interpret these sounds of the depth. We will describe sonar and its characteristics and learn that sonar is the principal instrument used to detect submarines.</p>	1-3
Key terms - CPS	Ask students to respond to the CPS questions covering each key term.	4
Key terms - Definitions	Reinforce the correct definition for each key term.	5-8
Opening Question(Random Pick a Student – “RPS”)	This Opening Question is, “Discuss and explain the Doppler Shift.” Since this is a discussion question, it can be engaged using the RPS function, where CPS will display one student’s name or clicker number, chosen randomly. That student will orally answer the question (not with his/her clicker). Look for the arrow showing the button to engage it on the CPS toolbar below the slide. You might allow the students to discuss the question for 30-60 seconds with a partner before engaging the RPS question. The MobiView tablet can be used to write the students’ responses to the question on the slide, focusing the Doppler shift.	9
Warm-Up Questions(Lesson questions 1-2)	<p>Warm-up questions are typically used to gauge students’ level of interest, to generate interest in learning about upcoming topics, or to gauge prior opinions, knowledge or confidence in their knowledge, and/or uncover misconceptions that might be present. There may or may not be correct answers to these questions.</p> <p>Ask students to respond to each Warm-up question, with follow-up discussion based on responses as appropriate.</p>	10
The Doppler Shift	Explain that you may have noticed the apparent change in frequency or pitch of a train whistle or automobile horn as the train or auto approaches, passes, and departs. Actually, there is no change in the frequency emitted by the source. There is, however, a change in the frequency reaching the ear because of the relative motion between the source and you. As the train or auto approaches, the effect is an increase in frequency caused by compression of the distance between waves. When the source is opposite you, you hear the same frequency as the whistle or horn puts out. When the train or auto moves away, the effect is to increase the distance between waves, thus causing a decrease in the frequency reaching your ear.	11-14
Video on the Doppler Shift	Show video on the Doppler shift.	15

Chapter 23 / Section: NS2-M3C23S2 – The Doppler Shift

The Doppler Shift	Explain that this phenomenon is known as the Doppler effect, named for the Austrian physicist Christian Doppler (1803–1853). The change between the highest and lowest frequencies heard and the source frequency is called the Doppler shift.	16-17
The Doppler Shift	Explain that the Doppler shift can be used to determine the speed and direction of motion of a sound's source, such as a submarine in the ocean. It also occurs with electromagnetic waves such as radio and light. By analyzing the Doppler shift in light from a distant star, for instance, astronomers can determine the speed at which it is moving away from us. Radar detectors use the Doppler shift to determine the speed of baseballs and automobiles.	18-19
Sound in the Sea	Explain that since Navy ships and submarines operate in the sea, the characteristics of sound in seawater are of special interest to Navy people. The speed of sound waves traveling through seawater is affected by three factors: (1) its temperature; (2) its pressure, a function of depth; and (3) its salinity, or salt content.	20-21
Sound in the Sea	Explain that temperature is by far the most important of these factors. The speed of sound changes from 4 to 8 feet per second for every degree of temperature change. The temperature of the sea varies from freezing in the polar seas to more than 85 degrees F in the tropics.	22-24
Check on Learning Questions A (Lesson questions 3-4)	Check in on student's understanding of information covered so far by engaging lesson questions 3 and 4, with follow-up discussion as appropriate.	25
Sound in the Sea	Explain that temperature may decrease by more than 30 degrees from the surface to a depth of 450 feet. It is apparent then, that temperature changes in the sea have a great effect on the speed of sound in sea water.	26-27
Sound in the Sea	Explain that sound also travels faster in water under pressure, since the density increases somewhat as pressure increases. Pressure increases as depth increases, so the deeper a sound wave is, the faster it travels. The pressure effect is smaller than temperature effect, but it cannot be neglected since it increases about 2 feet per second for each 100 feet of depth.	28
Sound in the Sea	Explain that seawater has high mineral content or salinity. The density of seawater is about 64 pounds per cubic foot; that of fresh water is only about 62.4 pounds per cubic foot. This variation is the result of the salt content in sea water. The saltier the water, the greater its density, and hence the faster the speed of sound in it. The speed of sound increases about 4 feet per second for each part-per-thousand increase in salinity—a lesser effect than that of temperature, but greater than that of pressure.	29-33
Sonar	Explain that the principal means of detecting and tracking submarines at sea is called sonar (short for sound navigation and ranging). The earliest sonar device, used in World War I, was a simple hydrophone. The hydrophone could be lowered into the water to listen for noises generated by submerged submarines. Three ships equipped with this apparatus could pinpoint the location of U-boats by triangulation or the plotting the bearings of the hydrophone noise from the three ships and seeing where the bearings crossed.	34-36
Sonar	Explain that sonar information is normally presented visually on a CRT screen rather than by sound as the early devices did.	37-39
Check on Learning Questions B (Lesson questions 5-6)	Check in on students' understanding of information covered so far by engaging lesson questions 5 and 6, with follow-up discussion as appropriate.	40

Chapter 23 / Section: NS2-M3C23S2 – The Doppler Shift

Sonar	<p>Explain that very sophisticated sonars for use by helicopters and fixed-wing aircraft have been developed.</p> <p>Explain that there are two basic modes of operation of sonar systems employed for the detection of targets. They are referred to as active and passive modes.</p>	41
Sonar	<p>Explain that active sonars transmit underwater sound pulses that strike targets and return in the form of echoes. The returned echoes indicate the range and bearing of the target. Surface undersea warfare ships (U.S.W.) usually employ the active or pinging mode when seeking out submarines. Active sonar is also used by submarines and ships to analyze shorelines, bottom characteristics, and ocean depths.</p> <p>Submarines can switch to active modes to locate ships or other submarines, but this is rarely done because it would give away the transmitting sub's location. Passive sonars do not transmit sound.</p>	42-44
Sonar	<p>Explain that passive sonars only listen for sounds produced by the target to obtain accurate bearing and estimated range information. Target detection is achieved at great ranges through the use of highly sensitive hydrophones. Passive sonar is primarily used by submarines, but surface ships can employ passive modes in addition to their active sonar. Submarines use passive sonar to analyze the noise of passing ships. U.S.W. aircraft, helicopters, and shore stations also use passive sonar.</p>	45-48
Sonar	<p>Explain that until recently most shipboard sonar systems were mounted in domes underneath the ship's bow, and were therefore hull-mounted systems. To separate the hydrophone from the noise generated by the ship itself, passive sonar systems called 'towed arrays' have been installed in increasing numbers of U.S.W. surface ships and submarines. This consists of a semi-buoyant tube of a length of several thousand feet or more that is fitted with numerous hydrophones. The tube is unreeled and towed behind the ship. Such an array is extremely sensitive and can pick up noise generated by submarines operating many miles away.</p>	49-52
Sonar	<p>Explain that most ships also have aboard a fathometer (echo sounder) for determining water depth under the hull. A sound pulse is transmitted toward the bottom, and its echo is received back. The fathometer is normally used as a navigational aid, particularly when entering shallow water. It also is used regularly in oceanographic research to determine the contour of the sea bottom. Most Navy ships keep their fathometer turned on continuously to have an accurate recording of the water depths on their course. The information can be displayed numerically or can be automatically recorded by a stylus on a roll of graph paper.</p>	53-56
Sonar	<p>Explain that sonar equipment called 'dipping sonar' can be used by helicopters to detect submerged submarines. The helicopter can hover and lower a hydrophone (passive) or pinging transducer (active) into the sea to a depth of about 400 feet. The sonar searches a 360-degree area. After searching, the helicopter hauls in the cable and quickly goes to another spot. When a submarine is detected, the helicopter can attack the submarine with homing torpedoes or bring in other U.S.W. units to assist.</p>	57-59
Sonar	<p>Explain that radio sonobuoys are small, expendable floating hydrophone units that are dropped by aircraft in the area of a suspected submarine. They are usually dropped one at a time in a circular pattern around the contact area. By analyzing the radio signals received from each sonobuoy, the location and direction of movement of the submarine can be determined. It can then be attacked by the aircraft itself or by other available U.S.W. forces.</p>	60-61

Chapter 23 / Section: NS2-M3C23S2 – The Doppler Shift

Review Question	The Review Question is, “Name and discuss three factors can affect the speed of sound in water.” Question is designed to provide an opportunity for some reflection and assimilation of the content covered, and is to be engaged in RPS mode as the Opening Question above. MobiView can be used here to write the students’ best responses for visual reinforcement, and to foster discussion.	62
Closing Questions(Lesson Questions 7 - 8)	Have students respond to questions 7 and 8 covering the final segment of the lesson, with follow-up reinforcement and discussion as appropriate.	63
Call for Other Questions	Provide the opportunity for students to ask final questions regarding the content covered.	64

III. Supplemental Activities -

A. In Class Activity:

Supplies required: Handouts for In Class and Take Home activities

When: At the end of the lesson

- Using the handout “Speed of Sound”, have the cadets write a paragraph answering the question: What three factors affect the speed of sound? Have the cadet explain how each one impacts the speed of sound and give examples?

B. Take Home Activity: Have the cadets use the handout “Doppler Shift” and name the advantages and disadvantages in using passive or active sonar to detect a target?

IV. Evaluation - see CPS database for chapter test questions.

Chapter 23 / Section: NS2-M3C23S2 – The Doppler Shift

Activity 1: In Class Activity – Speed of Sound

Name: _____ Date: _____ Class: _____

Write a paragraph answering the question: What three factors affect the speed of sound? Have the cadet explain how each one impacts the speed of sound and give examples?

[illegible]

Chapter 23 / Section: NS2-M3C23S2 – The Doppler Shift

Activity 1: Take Home Activity – The Doppler Shift

Name: _____ Date: _____ Class: _____

What are the advantages and disadvantages in using passive or active sonar to detect a target?

PASSIVE SONAR	ACTIVE SONAR

Naval Science 2

Linked Standards/Chapter Matrix

Common Core - ELA Grades 9-10

		NS2M1C1: Sea Power and Western Civilization	NS2M1C2: The American Revolution 1775-17	NS2M1C3: The Growth of American Sea Power	NS2M1C4: The Civil War 1861 - 1865	NS2M1C5: America's Rise to World Power S	NS2M1C6: World War I, 1914 - 1918	NS2M1C7: The Interwar Years	NS2M1C8: World War II: The Atlantic War	NS2M1C9: World War II: The Pacific War	NS2M1C10: The Cold War Era	NS2M1C11: The 1990s	NS2M1C12: The New Millennium	NS2M2C1: NJROTC Leadership	NS2M2C3: Leadership Skills	NS2M2C2: Approaches to Leadership	NS2M3C1: Maritime Geography on the Western Seas	NS2M3C2: Maritime Geography on the Eastern Seas	NS2M3C3: Earth's Oceanographic History	NS2M3C4: Undersea Landscapes	NS2M3C5: Seawater - Makeup & Movements	NS2M3C6: Life in the Seas	NS2M3C7: Meteorology	NS2M3C8: Life in the Seas	NS2M3C9: Wind and Weather	NS2M3C10: Fronts and Storms	NS2M3C11: Weather Forecasting	NS2M3C12: Introduction to Astronomical Observations	NS2M3C13: The Moon	NS2M3C14: The Sun	NS2M3C15: The Planets	NS2M3C16: Asteroids, Comets, and Meteor	NS2M3C17: The Stars	NS2M3C18: Motion, Force, and Aerodynamic	NS2M3C19: Buoyancy	NS2M3C20: Basic Electricity	NS2M3C21: Electronics	NS2M3C22: Computers and the Internet	N2M3C23: Sound and Sonar	
RI.9-10. READING:INFORMATIONAL TEXT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RI.9-10.2. Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.														X																										
RI.9-10.3. Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them.		X				X							X																											
RI.9-10.4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).	X		X	X					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X													

[illegible]

	NS2M1C1: Sea Power and Western Civilization NS2M1C2: The American Revolution 1775-17 NS2M1C3: The Growth of American Sea Power NS2M1C4: The Civil War 1861 - 1865 NS2M1C5: America's Rise to World Power S NS2M1C6: World War I, 1914 - 1918 NS2M1C7: The Interwar Years NS2M1C8: World War II: The Atlantic War NS2M1C9: World War II: The Pacific War NS2M1C10: The Cold War Era NS2M1C11: The 1990s NS2M1C12: The New Millennium NS2M2C1: NJROTC Leadership NS2M2C3: Leadership Skills NS2M2C2: Approaches to Leadership NS2M3C1: Maritime Geography on the Western Seas NS2M3C2: Maritime Geography on the Eastern Seas NS2M3C3: Earth's Oceanographic History NS2M3C4: Undersea Landscapes NS2M3C5: Seawater - Makeup & Movements NS2M3C6: Life in the Seas NS2M3C7: Meteorology NS2M3C8: Life in the Seas NS2M3C9: Wind and Weather NS2M3C10: Fronts and Storms NS2M3C11: Weather Forecasting NS2M3C12: Introduction to Astronomical Observations NS2M3C13: The Moon NS2M3C14: The Sun NS2M3C15: The Planets NS2M3C16: Asteroids, Comets, and Meteor NS2M3C17: The Stars NS2M3C18: Motion, Force, and Aerodynamic NS2M3C19: Buoyancy NS2M3C20: Basic Electricity NS2M3C21: Electronics NS2M3C22: Computers and the Internet N2M3C23: Sound and Sonar																																										
W.9-10.1.b. Develop claim(s) and counterclaims fairly, supplying evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience s knowledge level and concerns.		X	X	X						X				X	X	X	X				X	X									X												
W.9-10.1.c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.			X	X							X				X	X	X	X				X																					
W.9-10.1.d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.	X	X	X	X	X				X	X	X																X				X												
W.9-10.1.e. Provide a concluding statement or section that follows from and supports the argument presented.	X	X	X	X	X				X	X	X																X				X												
W.9-10.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.	X	X		X		X	X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X						X	X		X				X	
W.9-10.2.a. Introduce a topic; organize complex ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.			X			X					X					X		X		X															X	X	X						
W.9-10.2.b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience s knowledge of the topic.	X	X					X	X	X		X							X			X			X	X	X								X		X						X	
W.9-10.2.c. Use appropriate and varied transitions to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.	X	X						X			X						X	X			X																						

[illegible]

	NS2M1C1: Sea Power and Western Civilization		NS2M1C2: The American Revolution 1775-17		NS2M1C3: The Growth of American Sea Power		NS2M1C4: The Civil War 1861 - 1865		NS2M1C5: America's Rise to World Power S		NS2M1C6: World War I, 1914 - 1918		NS2M1C7: The Interwar Years		NS2M1C8: World War II: The Atlantic War		NS2M1C9: World War II: The Pacific War		NS2M1C10: The Cold War Era		NS2M1C11: The 1990s		NS2M1C12: The New Millennium		NS2M2C1: NJROTC Leadership		NS2M2C3: Leadership Skills		NS2M2C2: Approaches to Leadership		NS2M3C1: Maritime Geography on the Western Seas		NS2M3C2: Maritime Geography on the Eastern Seas		NS2M3C3: Earth's Oceanographic History		NS2M3C4: Undersea Landscapes		NS2M3C5: Seawater - Makeup & Movements		NS2M3C6: Life in the Seas		NS2M3C7: Meteorology		NS2M3C8: Life in the Seas		NS2M3C9: Wind and Weather		NS2M3C10: Fronts and Storms		NS2M3C11: Weather Forecasting		NS2M3C12: Introduction to Astronomical Observations		NS2M3C13: The Moon		NS2M3C14: The Sun		NS2M3C15: The Planets		NS2M3C16: Asteroids, Comets, and Meteor		NS2M3C17: The Stars		NS2M3C18: Motion, Force, and Aerodynamic		NS2M3C19: Buoyancy		NS2M3C20: Basic Electricity		NS2M3C21: Electronics		NS2M3C22: Computers and the Internet		N2M3C23: Sound and Sonar																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
W.9-10.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1 3 above.)	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X											X	X		X																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

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SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9 10 topics, texts, and issues, building on others ideas and expressing their own clearly and persuasively.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
SL.9-10.1.a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.		X						X	X	X	X	X																	X													
SL.9-10.1.b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.										X	X				X	X	X	X	X	X	X	X	X	X	X																	
SL.9-10.1.c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X												
SL.9-10.1.d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented.	X	X	X	X						X	X	X			X						X								X	X	X	X										
SL.9-10.2. Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.				X						X										X	X		X	X	X		X			X			X									
SL.9-10.3. Evaluate a speaker s point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence.				X						X					X					X	X																					

	NS2M1C1: Sea Power and Western Civilization	NS2M1C2: The American Revolution 1775-17	NS2M1C3: The Growth of American Sea Power	NS2M1C4: The Civil War 1861 - 1865	NS2M1C5: America's Rise to World Power S	NS2M1C6: World War I, 1914 - 1918	NS2M1C7: The Interwar Years	NS2M1C8: World War II: The Atlantic War	NS2M1C9: World War II: The Pacific War	NS2M1C10: The Cold War Era	NS2M1C11: The 1990s	NS2M1C12: The New Millennium	NS2M2C1: NJROTC Leadership	NS2M2C3: Leadership Skills	NS2M2C2: Approaches to Leadership	NS2M3C1: Maritime Geography on the Western Seas	NS2M3C2: Maritime Geography on the Eastern Seas	NS2M3C3: Earth's Oceanographic History	NS2M3C4: Undersea Landscapes	NS2M3C5: Seawater - Makeup & Movements	NS2M3C6: Life in the Seas	NS2M3C7: Meteorology	NS2M3C8: Life in the Seas	NS2M3C9: Wind and Weather	NS2M3C10: Fronts and Storms	NS2M3C11: Weather Forecasting	NS2M3C12: Introduction to Astronomical Observations	NS2M3C13: The Moon	NS2M3C14: The Sun	NS2M3C15: The Planets	NS2M3C16: Asteroids, Comets, and Meteor	NS2M3C17: The Stars	NS2M3C18: Motion, Force, and Aerodynamic	NS2M3C19: Buoyancy	NS2M3C20: Basic Electricity	NS2M3C21: Electronics	NS2M3C22: Computers and the Internet	N2M3C23: Sound and Sonar		
L.9-10.4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9-10 reading and content, choosing flexibly from a range of strategies.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
L.9-10.4.a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word s position or function in a sentence) as a clue to the meaning of a word or phrase.	X	X	X	X	X	X	X	X	X	X	X	X															X		X	X					X	X	X	X	X	
L.9-10.4.b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., analyze, analysis, analytical; advocate, advocacy).								X		X																														
L.9-10.5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.				X				X		X		X			X													X												
L.9-10.5.a. Interpret figures of speech (e.g., euphemism, oxymoron) in context and analyze their role in the text.								X		X					X																									
L.9-10.5.b. Analyze nuances in the meaning of words with similar denotations.								X		X																														
L.9-10.6. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Naval Science 2

Standards Chapter Matrix
C3-Framework for Social Studies State Standards

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	NS2M1C1: Sea Power and Western Civilization NS2M1C2: The American Revolution 1775-17 NS2M1C3: The Growth of American Sea Power NS2M1C4: The Civil War 1861 - 1865 NS2M1C5: America's Rise to World Power Status NS2M1C6: World War I, 1914 - 1918 NS2M1C7: The Interwar Years NS2M1C8: World War II: The Atlantic War NS2M1C9: World War II: The Pacific War NS2M1C10: The Cold War Era NS2M1C11: The 1990s NS2M1C12: The New Millennium NS2M2C1: NJROTC Leadership NS2M2C3: Leadership Skills NS2M2C2: Approaches to Leadership NS2M3C1: Maritime Geography on the Western Seas NS2M3C2: Maritime Geography on the Eastern Seas NS2M3C3: Earth's Oceanographic History NS2M3C4: Undersea Landscapes NS2M3C5: Seawater - Makeup & Movements NS2M3C6: Life in the Seas NS2M3C7: Meteorology NS2M3C8: Life in the Seas NS2M3C9: Wind and Weather NS2M3C10: Fronts and Storms NS2M3C11: Weather Forecasting NS2M3C12: Introduction to Astronomical Observations NS2M3C13: The Moon NS2M3C14: The Sun NS2M3C15: The Planets NS2M3C16: Asteroids, Comets, and Meteor NS2M3C17: The Stars NS2M3C18: Motion, Force, and Aerodynamic NS2M3C19: Buoyancy NS2M3C20: Basic Electricity NS2M3C21: Electronics NS2M3C22: Computers and the Internet N2M3C23: Sound and Sonar																			
D2.Civ.10.9-12. Analyze the impact and the appropriate roles of personal interests and perspectives on the application of civic virtues, democratic principles, constitutional rights, and human rights.			X																	
D2.Civ.11.9-12. Evaluate multiple procedures for making governmental decisions at the local, state, national, and international levels in terms of the civic purposes achieved.							X													
D2.Civ.12.9-12. Analyze how people use and challenge local, state, national, and international laws to address a variety of public issues.										X	X									
D2.Civ.13.9-12. Evaluate public policies in terms of intended and unintended outcomes, and related consequences.				X																
D2.Civ.14.9-12. Analyze historical, contemporary, and emerging means of changing societies, promoting the common good, and protecting rights.		X	X	X																
D2. Economic Decision Making			X				X													
D2.Eco.4.9-12. Evaluate the extent to which competition among sellers and among buyers exists in specific markets.			X																	
D2.Eco.5.9-12. Describe the consequences of competition in specific markets.			X																	
D2.Eco.14.9-12. Analyze the role of comparative advantage in international trade of goods and services.							X													
D2. Geography	X	X	X	X	X		X	X	X	X	X		X				X			

	NS2M1C1: Sea Power and Western Civilization NS2M1C2: The American Revolution 1775-17 NS2M1C3: The Growth of American Sea Power NS2M1C4: The Civil War 1861 - 1865 NS2M1C5: America's Rise to World Power Status NS2M1C6: World War I, 1914 - 1918 NS2M1C7: The Interwar Years NS2M1C8: World War II: The Atlantic War NS2M1C9: World War II: The Pacific War NS2M1C10: The Cold War Era NS2M1C11: The 1990s NS2M1C12: The New Millennium NS2M2C1: NJROTC Leadership NS2M2C3: Leadership Skills NS2M2C2: Approaches to Leadership NS2M3C1: Maritime Geography on the Western Seas NS2M3C2: Maritime Geography on the Eastern Seas NS2M3C3: Earth's Oceanographic History NS2M3C4: Undersea Landscapes NS2M3C5: Seawater - Makeup & Movements NS2M3C6: Life in the Seas NS2M3C7: Meteorology NS2M3C8: Life in the Seas NS2M3C9: Wind and Weather NS2M3C10: Fronts and Storms NS2M3C11: Weather Forecasting NS2M3C12: Introduction to Astronomical Observations NS2M3C13: The Moon NS2M3C14: The Sun NS2M3C15: The Planets NS2M3C16: Asteroids, Comets, and Meteor NS2M3C17: The Stars NS2M3C18: Motion, Force, and Aerodynamic NS2M3C19: Buoyancy NS2M3C20: Basic Electricity NS2M3C21: Electronics NS2M3C22: Computers and the Internet N2M3C23: Sound and Sonar																						
D2.Geo.2.9-12. Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their political, cultural, and economic dynamics.			X	X	X					X						X	X	X	X	X			
D2.Geo.4.9-12. Analyze relationships and interactions within and between human and physical systems to explain reciprocal influences that occur among them.	X		X				X	X								X	X	X	X		X	X	
D2.Geo.5.9-12. Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.			X	X			X		X							X	X	X	X				
D2.Geo.6.9-12. Evaluate the impact of human settlement activities on the environmental and cultural characteristics of specific places and regions.	X															X		X					
D2.Geo.7.9-12. Analyze the reciprocal nature of how historical events and the spatial diffusion of ideas, technologies, and cultural practices have influenced migration patterns and the distribution of human population.	X		X																X				
D2.Geo.8.9-12. Evaluate the impact of economic activities and political decisions on spatial patterns within and among urban, suburban, and rural regions.														X	X								
D2.Geo.9.9-12. Evaluate the influence of long-term climate variability on human migration and settlement patterns, resource use, and land uses at local-to-global scales.																	X	X		X			
D2.Geo.10.9-12. Evaluate how changes in the environmental and cultural characteristics of a place or region influence spatial patterns of trade and land use.	X	X										X			X	X							
D2.Geo.11.9-12. Evaluate how economic globalization and the expanding use of scarce resources contribute to conflict and cooperation within and among countries.	X	X	X				X								X	X		X					

[illegible]

[illegible]

National Council for the Social Studies (NCSS), The College, Career, and Civic Life (C3) Framework for Social Studies State Standards: Guidance for Enhancing the Rigor of K-12 Civics, Economics, Geography, and History (Silver Spring, MD: NCSS, 2013)

External Standards/Chapter Matrix

National Health Education Standards (NHES)

1

[illegible]

Naval Science 2

External Standards/Chapter Matrix

Next Generation Science Standards (NGSS)

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	NS2M1C1: Sea Power and Western Civilization	NS2M1C2: The American Revolution 1775-1783	NS2M1C3: The Growth of American Sea Power	NS2M1C4: The Civil War 1861 - 1865	NS2M1C5: America's Rise to World Power Status	NS2M1C6: World War I, 1914 - 1918	NS2M1C7: The Interwar Years	NS2M1C8: World War II: The Atlantic War	NS2M1C9: World War II: The Pacific War	NS2M1C10: The Cold War Era	NS2M1C11: The 1990s	NS2M1C12: The New Millennium	NS2M2C1: NJROTC Leadership	NS2M2C3: Leadership Skills	NS2M2C2: Approaches to Leadership	NS2M3C1: Maritime Geography on the Weste	NS2M3C2: Maritime Geography on the Easte	NS2M3C3: Earth's Oceanographic History	NS2M3C4: Undersea Landscapes	NS2M3C5: Seawater - Makeup & Movements	NS2M3C6: Life in the Seas	NS2M3C7: Meteorology	NS2M3C8: Life in the Seas	NS2M3C9: Wind and Weather	NS2M3C10: Fronts and Storms	NS2M3C11: Weather Forecasting	NS2M3C12: Introduction to Astronomical Observations	NS2M3C13: The Moon	NS2M3C14: The Sun	NS2M3C15: The Planets	NS2M3C16: Asteroids, Comets, and Meteor	NS2M3C17: The Stars	NS2M3C18: Motion, Force, and Aerodynamic	NS2M3C19: Buoyancy	NS2M3C20: Basic Electricity	NS2M3C21: Electronics	NS2M3C22: Computers and the Internet	N2M3C23: Sound and Sonar	
HS-ESS1-2. Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.																										X													
HS.History of Earth																	X	X	X	X						X					X								
HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.																	X	X	X	X																			
HS-ESS1-6. Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history.																	X	X	X							X					X								
HS.Earth's Systems																		X		X																			
HS-ESS2-2. Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.																		X																					
HS-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.																		X		X																			
HS-ESS2-7. Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.																		X																					
HS.Weather and Climate																	X		X				X			X													

	NS2M1C1: Sea Power and Western Civilization	NS2M1C2: The American Revolution 1775-1783	NS2M1C3: The Growth of American Sea Power	NS2M1C4: The Civil War 1861 - 1865	NS2M1C5: America's Rise to World Power Status	NS2M1C6: World War I, 1914 - 1918	NS2M1C7: The Interwar Years	NS2M1C8: World War II: The Atlantic War	NS2M1C9: World War II: The Pacific War	NS2M1C10: The Cold War Era	NS2M1C11: The 1990s	NS2M1C12: The New Millennium	NS2M2C1: NJROTC Leadership	NS2M2C3: Leadership Skills	NS2M2C2: Approaches to Leadership	NS2M3C1: Maritime Geography on the Weste	NS2M3C2: Maritime Geography on the Easte	NS2M3C3: Earth's Oceanographic History	NS2M3C4: Undersea Landscapes	NS2M3C5: Seawater - Makeup & Movements	NS2M3C6: Life in the Seas	NS2M3C7: Meteorology	NS2M3C8: Life in the Seas	NS2M3C9: Wind and Weather	NS2M3C10: Fronts and Storms	NS2M3C11: Weather Forecasting	NS2M3C12: Introduction to Astronomical Observations	NS2M3C13: The Moon	NS2M3C14: The Sun	NS2M3C15: The Planets	NS2M3C16: Asteroids, Comets, and Meteor	NS2M3C17: The Stars	NS2M3C18: Motion, Force, and Aerodynamic	NS2M3C19: Buoyancy	NS2M3C20: Basic Electricity	NS2M3C21: Electronics	NS2M3C22: Computers and the Internet	N2M3C23: Sound and Sonar	
HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.																	X		X			X																	
HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.																								X	X														
HS.Human Sustainability															X	X	X			X	X			X															
HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.															X	X	X			X	X			X															
HS.Forces and Interactions																																	X						
HS-PS2-1. Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.																																	X						
HS.Waves and Electromagnetic Radiation																										X							X			X	X	X	
HS-PS4-1. Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.																																	X			X		X	
HS-PS4-2. Evaluate questions about the advantages of using a digital transmission and storage of information.																																				X			

HS-PS4-5. Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.*		NS2M1C1: Sea Power and Western Civilization
		NS2M1C2: The American Revolution 1775-1783
		NS2M1C3: The Growth of American Sea Power
		NS2M1C4: The Civil War 1861 - 1865
		NS2M1C5: America's Rise to World Power Status
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		NS2M1C7: The Interwar Years
		NS2M1C8: World War II: The Atlantic War
		NS2M1C9: World War II: The Pacific War
		NS2M1C10: The Cold War Era
		NS2M1C11: The 1990s
		NS2M1C12: The New Millennium
		NS2M2C1: NJROTC Leadership
		NS2M2C3: Leadership Skills
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		NS2M3C10: Fronts and Storms
		NS2M3C11: Weather Forecasting
	X	NS2M3C12: Introduction to Astronomical Observations
		NS2M3C13: The Moon
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		NS2M3C15: The Planets
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		NS2M3C17: The Stars
		NS2M3C18: Motion, Force, and Aerodynamic
		NS2M3C19: Buoyancy
		NS2M3C20: Basic Electricity
	X	NS2M3C21: Electronics
		NS2M3C22: Computers and the Internet
	X	N2M3C23: Sound and Sonar