Unit 2: Our Planetary System (Earth and Space Science, Engineering Design)

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Course(s): **Sample Course, Astronomy**
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Title Section

Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

Astronomy, 11-12

Unit 2 - Our Plantary System

Belleville Board of Education

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Unit Overview

This unit describes how Earth fits into the Solar System. It also explains the difference between the Jovian and Terrestrial planets and explains the history and purpose of comets, asteroids, Kuiper Belt objects and other solar system debris. The unit also describes how each of the Terrestrial planets have similarities and differences and tries to explain how and why that is the case.

Enduring Understanding

Unit Enduring Understandings

• Terrestrial planets are smaller, more dense and closer to the Sun; Jovian planets are mostly gaseous have much greater mass than terrestrial planets. Due to their masses, Jovian planets have greater gravitational pulls than the terrestrial planets and therefore all have more moons and also have rings.

• Due to the current definition of a planet (it must have a clear path and somehow interact with other planets), Pluto is considered to be a dwarf planet and Kuiper belt object.

• There are three different types of asteroids determined by their make-up (Carbonaceous, Silicaceous or Metallic).

• A comet is made up of a rocky body surrounded by ice, a coma and sometimes a tail.

• No, a comet only has a tail when it is close to the Sun. The tail caused by the solar winds always faces away from the Sun.

• Earth's atmosphere is composed of 78% N_2, 21% O_2, with the remaining percent made up of CO_2, Ar, H_2O and other gases.

• The atmosphere, the hydrosphere, the lithosphere and the asthenosphere,

• Tectonic plates are parts of the lithosphere that lie upon the asthenosphere.

• Convection currents in the asthenosphere cause the tectonic plates to move in one of three ways: converging (creating mountains), diverging (creating mid-ocean ridges) or transform (moving past each other).

• The magnetosphere of the Earth is a magnetic field caused by the interaction between the North and South poles of the core. It protects the Earth from harmful rays of the Sun. But, at the poles the field is its weakest and when some of the solar winds reach the atmosphere can cause the Aurora Borealis or the Australius Borealis.

Essential Questions

Unit Essential Questions

• How do the terrestrial and Jovian planets compare?

• Why is Pluto not considered to be a planet?

• What is a Kuiper belt object?

• What is the make-up of an asteroid?

• What is the make-up of a comet?

• Does a comet always have a tail trailing it?

• What is the basic make-up of the Earth's atmosphere?

• What are the four spheres of the Earth?

• What are tectonic plates?

• How do tectonic plates dictate the formation of the Earth's crust?

• How does the Earth's magnetic field interact with the Sun's solar winds?

Exit Skills

By the end of Unit 2 Students Should be able to:

Discuss the importance of comparative planetology to solar system studies.

Describe the overall scale and structure of the solar system.

Summarize the basic differences between the terrestrial and Jovian planets.

Identify and describe the major non-planetary components of the solar system.

Describe some of the spacecraft missions the have contributed significantly to our knowledge of the solar system.

Outline the theory of the solar system formation that accounts for the overall properties of our planetary system.

Account for the differences between the terrestrial and Jovian planets.

Specify the general characteristics of the Moon and Mercury and compare them with those of Earth.

Describe the surface features of the Moon and Mercury, and recount how those two bodies were formed by dynamic events early in their history.

Explain how the Moon's rotation is influenced by its orbit around Earth and Mercury's orbit around the Sun.

Explain how observation of cratering can be used to estimate the age of a body's surface

Compare the Moon's interior structure with that of Mercury.

Summarize the various theories of the formation of the Moon and indicate which is currently considered most likely

Discuss how astronomers have pieced together the story of the Moon's evolution, and compare the evolutionary history with that of Mercury.

Summarize Venus' general orbital and physical properties.

Explain why Venus is hard to observe from Earth and how we have obtained more detailed knowledge of the planet.

Compare the surfaced features and geology of Venus with those of the Earth and the Moon.

Describe the characteristics of Venus' atmosphere with those of the Earth and Moon.

Explain why the greenhouse effect has produced conditions on Venus very different from those on Earth.

Describe Venus's magnetic field and internal structure.

Summarize the general orbital and physical properties of Mars.

Describe the observational evidence for seasonal changes on Mars.

Compare the surface features and geology of Mars and those of the Moon and Earth, and account for these characteristics in terms of Martian history.

Discuss this evidence that Mars once had a much denser atmosphere.

Compare the atmosphere of Mars with that of Earth and Venus, and explain why the evolutionary histories of these three worlds diverged so sharply.

Describe the characteristics of Mars' moons, and explain their probable origin.

Specify the ways in which Jupiter differs from the terrestrial planets in its physical and orbital properties.

Discuss the processes responsible for the appearance of Jupiter's atmosphere.

Describe Jupiter's internal structure and composition, and explain how these are inferred from external measurements.

Summarize the characteristics of Jupiter's magnetosphere.

Discuss the orbital properties of the Galilean moons of Jupiter, and describe the appearance and physical properties of each moon.

Summarize the orbital and physical properties of Saturn and compare them with those of Jupiter.

Describe the compositions and structures of Saturn's atmosphere and interior.

Explain why Saturn's internal heat source and magnetosphere differ from those of Jupiter.

Describe the structure and composition of Saturn's rings.

Describe how both calculations and chance played major roles in the discoveries of the outer planets.

Summarize the orbital and physical properties of Pluto and explain how the Pluto-Charon system fundamentally from all the other planets.

Describe the orbital properties of the major groups of asteroids.

Summarize the composition and physical properties of a typical asteroid.

Explain the effect of orbital resonances on the structure of the asteroid belt.

Detail the composition and structure of a typical comet and explain the formation and appearance of the tail.

Discuss the characteristics of cometary orbits and what they tell us about the probable origin of comets.

Distinguish among the terms meteor, meteoroid and meteorite.

Summarize what the orbital and physical properties suggest about the probable origin of meteoroids.

Describe how comets and asteroids form and explain their role in determining planetary properties.

Outline the properties of know extra-solar planets, and explain how they differ from planets in the solar system.

Summarize the physical properties of planet Earth.

Explain how Earth's atmosphere helps to heat us, as well as protect us.

Outline our current model of Earth's interior and describe some of the experimental techniques used to establish the model.

Summarize the evidence for the phenomenon of "continental drift" and discuss the physical processes that drive it.

Discuss the nature and origin of Earth's magnetosphere.

New Jersey Student Learning Standards (NJSLS-S)

NextGen Science Standards

HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
HS-ETS1-3	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
HS-ETS1-4	Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.
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-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-ESS2-3	Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.
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.

Interdisciplinary Connections

MA.A-SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
LA.RST.11-12.1	Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions.
LA.RST.11-12.2	Determine the central ideas, themes, or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
LA.RST.11-12.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
MA.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems.
MA.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
MA.A-CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.

Learning Objectives

Discuss the importance of comparative planetology to solar system studies.

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• Summarize the physical properties of planet Earth.

• Explain how Earth's atmosphere helps to heat us, as well as protect us.

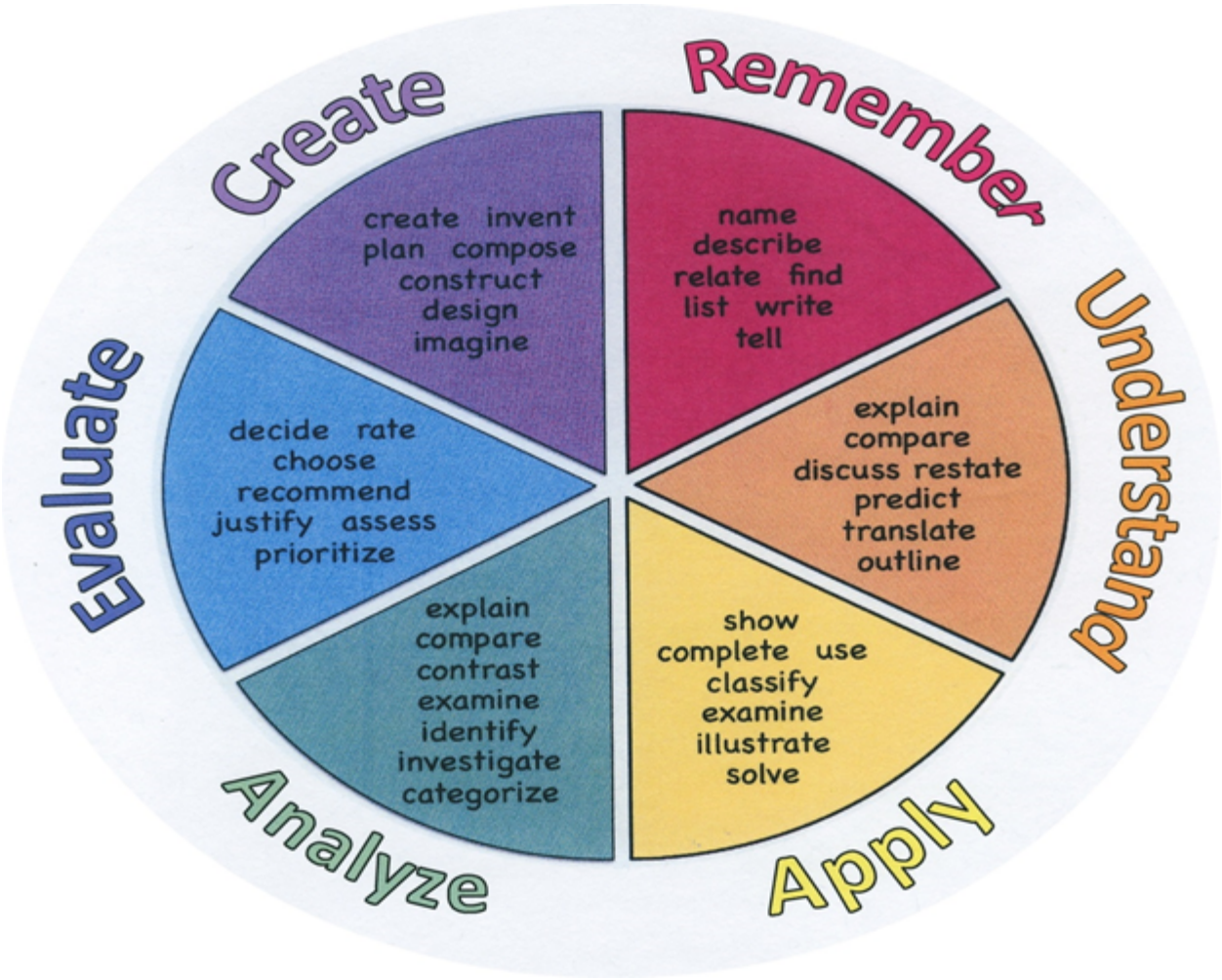
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• Summarize the evidence for the phenomenon of "continental drift" and discuss the physical processes that drive it.

• Discuss the nature and origin of Earth's magnetosphere.

Action Verbs: Below are examples of action verbs associated with each level of the Revised Bloom's Taxonomy.

Remember	Understand	Apply	Analyze	Evaluate	Create
Choose	Classify	Choose	Categorize	Appraise	Combine
Describe	Defend	Dramatize	Classify	Judge	Compose
Define	Demonstrate	Explain	Compare	Criticize	Construct
Label	Distinguish	Generalize	Differentiate	Defend	Design
List	Explain	Judge	Distinguish	Compare	Develop
Locate	Express	Organize	Identify	Assess	Formulate
Match	Extend	Paint	Infer	Conclude	Hypothesize
Memorize	Give Examples	Prepare	Point out	Contrast	Invent
Name	Illustrate	Produce	Select	Critique	Make
Omit	Indicate	Select	Subdivide	Determine	Originate
Recite	Interrelate	Show	Survey	Grade	Organize
Select	Interpret	Sketch	Arrange	Justify	Plan
State	Infer	Solve	Breakdown	Measure	Produce
Count	Match	Use	Combine	Rank	Role Play
Draw	Paraphrase	Add	Detect	Rate	Drive
Outline	Represent	Calculate	Diagram	Support	Devise
Point	Restate	Change	Discriminate	Test	Generate
Quote	Rewrite	Classify	Illustrate		Integrate
Recall	Select	Complete	Outline		Prescribe
Recognize	Show	Compute	Point out		Propose
Repeat	Summarize	Discover	Separate		Reconstruct
Reproduce	Tell	Divide			Revise
	Translate	Examine			Rewrite
	Associate	Graph			Transform
	Compute	Interpolate			
	Convert	Manipulate			
	Discuss	Modify			
	Estimate	Operate			
	Extrapolate	Subtract			
	Generalize				
	Predict				



Suggested Activities & Best Practices

Assessment Evidence - Checking for Understanding (CFU)

1. Lab Reports - Keplers Law (Summative)
2. Project - Build your own legacy (Alternate)
3. Quizzes - Chapters 1-3 (Summative)
4. Tests - Test Chapter Material 1-3 (Summative)
5. "Do Now/Exit Ticket" Activity (Formative)

- Admit Tickets
- Anticipation Guide
- Common Benchmarks
- Compare & Contrast
- Create a Multimedia Poster
- DBQ's
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- Illustration
- Journals
- KWL Chart
- Learning Center Activities
- Multimedia Reports
- Newspaper Headline
- Outline
- Question Stems
- Quickwrite
- Quizzes
- Red Light, Green Light
- Self- assessments
- Socratic Seminar
- Study Guide
- Surveys
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Top 10 List
- Unit review/Test prep

- Unit tests
- Web-Based Assessments
- Written Reports

Primary Resources & Materials

Class Text: Chaisson, E. & McMillan, S. (2014). *Astronomy today*. Boston: Pearson.

Ancillary Resources

Fields of Study

1. Solar System
2. The Earth
3. The Moon
4. Space & Sun

Resources

1. Observatories & Planetirums
2. Current Sky Events & Space Missions
3. Orders of Magnitude - Scale in the Universe
4. Astronomy Simulations
5. Astronomy Software
6. Absolute Astronomy - Almanac
7. Spreadsheets for teaching astronomy

Educational Materials

1. JPL Educational Outreach: Jet Propulsion Laboratory, Pasadena CA
2. SpaceLink: NASA's electronic resources for educators
3. Space flight Now: Updates on current missions
4. NASA/JSC: Johnson Space Center, Houston TX
5. NASA Education Program: Education programs sponsored by NASA
6. NASA Quest: Learning technologies from NASA
7. NASA CORE: Central Operation of Resources for Educators: distribution of multimedia materials
8. Dryden Teacher Outreach: Education outreach programs
9. Planisphere: Template for making a planisphere

Online Magazines

1. Astronomy Magazine: Astronomy magazine
2. Sky & Telescope: Premier magazine for amateur astronomers
3. Stardate Magazine: McDonald Observatory, University of Texas, Austin
4. Astronomy Now: Current data on astronomy

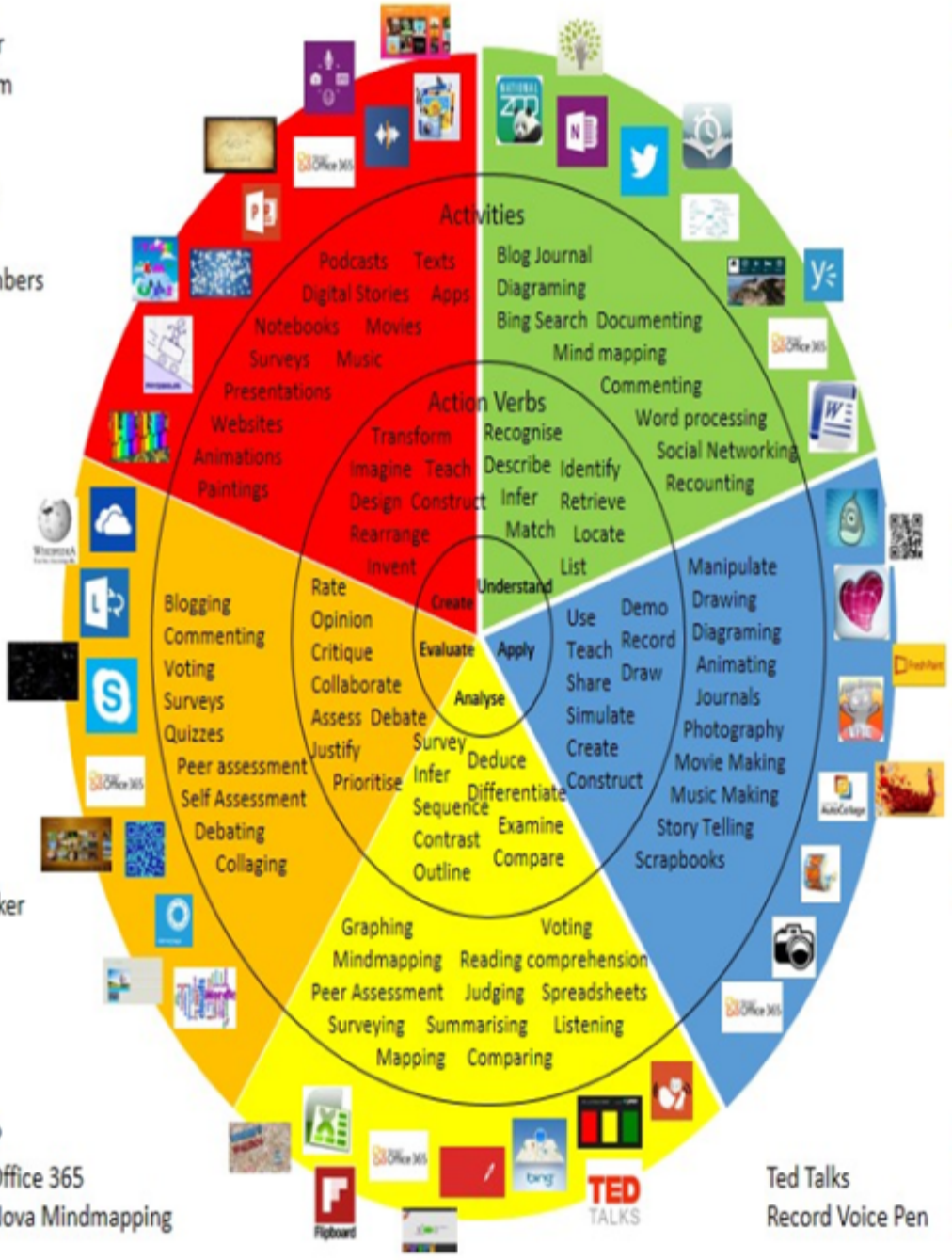
5. SpaceScience.com: Current events in space science

Technology Infusion

Win 8.1 Apps/Tools Pedagogy Wheel

Podcasts
Photostory 3
Kid Story Builder
Music Maker Jam
Paint A Story
Office 365
MS PowerPoint
Stack 'Em Up
NqSquared Numbers
Physamajig
Xylophone 8

Wikipedia
Skydrive
Lync
SkyMap
Skype
Office 365
Puzzle Touch
Easy QR
Memorylage
Life Moments
Word Cloud Maker



Where's Waldo?
MS Excel Office 365
Flipboard Nova Mindmapping

Ted Talks
Record Voice Pen

Originally taken from http://www.coetail.com/vzimmer/files/2013/02/iPadagogy-Wheel.001.jpg
And adapted for Windows 8.1 devices by Charlotte Beckhurst @CharBeckhurst

TECH.8.1.12.A.4	Construct a spreadsheet workbook with multiple worksheets, rename tabs to reflect the data on the worksheet, and use mathematical or logical functions, charts and data from all worksheets to convey the results.
TECH.8.1.12.A.5	Create a report from a relational database consisting of at least two tables and describe the process, and explain the report results.
TECH.8.1.12.A.CS2	Select and use applications effectively and productively.
TECH.8.1.12.B.CS1	Apply existing knowledge to generate new ideas, products, or processes.
TECH.8.1.12.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.
TECH.8.1.12.C.CS2	Communicate information and ideas to multiple audiences using a variety of media and formats.
TECH.8.1.12.E.CS1	Plan strategies to guide inquiry.
TECH.8.1.12.E.CS2	Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
TECH.8.1.12.E.CS4	Process data and report results.
TECH.8.1.12.F.CS3	Collect and analyze data to identify solutions and/or make informed decisions.
TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.B.CS2	The effects of technology on the environment.

Alignment to 21st Century Skills & Technology

- English Language Arts;
- Mathematics;
- Science and Scientific Inquiry (Next Generation);
- Social Studies, including American History, World History, Geography, Government and Civics, and Economics;
- World languages;
- Technology;
- Visual and Performing Arts.

CRP.K-12.CRP1.1	Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting

	with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
CRP.K-12.CRP5.1	Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.
CRP.K-12.CRP7.1	Career-ready individuals are discerning in accepting and using new information to make decisions, change practices or inform strategies. They use reliable research process to search for new information. They evaluate the validity of sources when considering the use and adoption of external information or practices in their workplace situation.
CRP.K-12.CRP8.1	Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.
CRP.K-12.CRP11.1	Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
CRP.K-12.CRP12.1	Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

21st Century Skills/Interdisciplinary Themes

- Communication and Collaboration
- Creativity and Innovation
- Critical thinking and Problem Solving
- ICT (Information, Communications and Technology) Literacy
- Information Literacy
- Life and Career Skills
- Media Literacy

21st Century Skills

- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy

- Global Awareness
- Health Literacy

Differentiation

Content

1. **1. Using reading materials at varying readability levels;**
2. **2. Using spelling or vocabulary lists**
3. **3. Presenting ideas through both auditory and visual means;**
4. **4. Using small groups and share pairs; and**
5. **5. Meeting with small groups to re-teach an idea or skill for struggling learners, or to extend the thinking or skills of advanced learners.**

Process

1. **1. Using tiered activities through which all learners work with the same important understandings and skills, but proceed with different levels of support, challenge, or complexity;**
2. **2. Developing personal agendas**
3. **3. Offering manipulatives or other hands-on supports**
4. **4. Varying the length of time a student may take to complete a task in order to provide additional support for a struggling learner or to encourage an advanced learner to pursue a topic in greater depth.**

Products

1. **1. Giving students options of how to express required learning**
2. **2. Using rubrics that match and extend students' varied skills levels;**
3. **3. Allowing students to work alone or in small groups on their products; and**
4. **4. Encouraging students to create their own product assignments as long as the assignments contain required elements.**

Learning environment

1. **1. Making sure there are places in the room to work quietly and without distraction, as well as places that invite student collaboration;**
2. **2. Providing materials that reflect a variety of cultures and home settings;**
3. **3. Setting out clear guidelines for independent work that matches individual needs;**
4. **4. Developing routines that allow students to get help when teachers are busy with other students and cannot help them immediately; and**
5. **5. Helping students understand that some learners need to move around to learn, while others do better sitting quietly (Tomlinson, 1995, 1999; Winebrenner, 1992, 1996).**

Differentiations:

- Small group instruction
- Small group assignments
- Extra time to complete assignments
- Pairing oral instruction with visuals
- Repeat directions

- Use manipulatives
- Center-based instruction
- Token economy
- Study guides
- Teacher reads assessments allowed
- Scheduled breaks
- Rephrase written directions
- Multisensory approaches
- Additional time
- Preview vocabulary
- Preview content & concepts
- Story guides
- Behavior management plan
- Highlight text
- Student(s) work with assigned partner
- Visual presentation
- Assistive technology
- Auditory presentations
- Large print edition
- Dictation to scribe
- Small group setting

Hi-Prep Differentiations:

- Alternative formative and summative assessments
- Choice boards
- Games and tournaments
- Group investigations
- Guided Reading
- Independent research and projects
- Interest groups
- Learning contracts
- Leveled rubrics
- Literature circles
- Multiple intelligence options
- Multiple texts
- Personal agendas
- Project-based learning
- Problem-based learning
- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products
- Varying organizers for instructions

Lo-Prep Differentiations

- Choice of books or activities
- Cubing activities
- Exploration by interest
- Flexible grouping
- Goal setting with students
- Jigsaw

- Mini workshops to re-teach or extend skills
- Open-ended activities
- Think-Pair-Share
- Reading buddies
- Varied journal prompts
- Varied supplemental materials

Special Education Learning (IEP's & 504's)

- Textbook for at-home use - Astronomy
- Additional time for assignments - Keplers Law and build your own galaxy
- Provision of notes or outlines - Chapters 1-3
- Choice of test format (multiple-choice, essay, true-false) - Chapters 1-3
- Alternate ways to evaluate (projects or oral presentations instead of written tests)

Use positive reinforcement

- printed copy of board work/notes provided
- additional time for skill mastery
- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes
- extended time on tests/ quizzes
- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length
- multi-sensory presentation
- multiple test sessions
- preferential seating
- preview of content, concepts, and vocabulary
- Provide modifications as dictated in the student's IEP/504 plan

- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes

English Language Learning (ELL)

Use flexible grouping; deliberately pair students heterogeneously by proficiency level.

ELP Level 2: Define vocabulary concepts from illustrations and word/ phrase banks. - Chapters 1-3

ELP Level 3: Give examples of vocabulary concepts from illustrations and word/phrase banks. - Chapters 1-3

- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarif
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning;
- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using computer word processing spell check and grammar check features
- using true/false, matching, or fill in the blank tests in lieu of essay tests

At Risk

- allowing students to correct errors (looking for understanding)

- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to select from given choices
- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify

Talented and Gifted Learning (T&G)

Special Topics Project, TED Talk, Independent Study Project - Solar Junk

- Above grade level placement option for qualified students
- Advanced problem-solving
- Allow students to work at a faster pace
- Cluster grouping
- Complete activities aligned with above grade level text using Benchmark results
- Create a blog or social media page about their unit
- Create a plan to solve an issue presented in the class or in a text
- Debate issues with research to support arguments
- Flexible skill grouping within a class or across grade level for rigor
- Higher order, critical & creative thinking skills, and discovery
- Multi-disciplinary unit and/or project
- Teacher-selected instructional strategies that are focused to provide challenge, engagement, and growth opportunities
- Utilize exploratory connections to higher-grade concepts
- Utilize project-based learning for greater depth of knowledge