Unit 1: Earth's Water and Atmosphere (Module E) - Earth and Space Science

Content Area: **Science**
Course(s): **Science 7 Honors**
Time Period:
Length: **75 to 90 school days Grade 7**
Status: **Published**

Title Section

Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

Earth Science Honors, Grade 7

HMH Earth's Water & Atmosphere (Module E)

Belleville Board of Education

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Board Approved:

Unit Overview

Engineering Design

- 7 steps of scientific methods
- Distinguish among independent variables, dependent variables, constants, and controls

ETS1.A: Defining and Delimiting Engineering Problems

- The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. (MS-ETS1-1)

ETS1.B: Developing Possible Solutions

- A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. (MS-ETS1-4)
- There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-ETS1-2), (MS-ETS1-3)
- Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. (MS-ETS1-3)
- Models of all kinds are important for testing solutions. (MS-ETS1-4)

ETS1.C: Optimizing the Design Solution

- Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design. (MS-ETS1-3)
- The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. (MSETS1-4)

Water Cycle

- Circulation in Earth's Atmosphere
- Circulation in Earth's Oceans
- Water Cycle

ESS2.C: The Roles of Water in Earth's Surface Processes

- Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land. (MS-ESS2-4)
- The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns. (MSESS2-5)
- Global movements of water and its changes in form are propelled by sunlight and gravity. (MS-ESS2-4)
- Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents. (MS-ESS2-6)
- Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations. (MS-ESS2-2)

ESS2.D: Weather and Climate

- Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns. (MS-ESS2-6)
- Because these patterns are so complex, weather can only be predicted probabilistically. (MS-ESS2-5)

Weather

- Influences on Weather
- Weather Prediction
- Severe weather and storms

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ESS3.B: Natural Hazards

- Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events. (MSESS3-2)

Climate

- Influences On Climate
- Climate Change
- Humans and Climate Change

ESS2.C: The Roles of Water in Earth's Surface Processes

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ESS3.B: Natural Hazards

- Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events. (MSESS3-2)

ESS3.C: Human Impacts on Earth Systems

- Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3)

- Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS-ESS3-3),(MS-ESS3- 4)

ESS3.D: Global Climate Change

- Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's

Enduring Understanding

- The world of science presents itself in many different capacities.
- Scientists follow a specific process of investigation to reach conclusions and theories.
- Internationally all scientists use specific units of measure to organize data and report results.
- Connections between humans and the ocean are important.
- Ocean currents are formed and they have an impact on the surrounding areas.
- The properties of water, the chemistry of seawater, temperature and salinity.
- Weather (in the short term) and climate (in the long term) involve the transfer of energy and water in and out of the atmosphere.
- Earth's components form systems. These systems continually interact at different rates of time, affecting the Earth regionally and globally.
- The composition and structure of the atmosphere allow life to be present on Earth.
- The unequal heating of the Earth's surface and the Coriolis effect cause major wind patterns, responsible for weather and climate.
- The results of the complex interactions of land, ocean and atmosphere affect the Earth's weather and climate systems.
- Climate is influenced locally and globally by atmospheric interactions with landmasses and bodies of water

Essential Questions

- How are oceans a reservoir of valuable food, energy, and mineral resources?
- How ocean affect life and property in coastal areas?
- What is the composition of seawater?
- What causes weather to be short term vs. climate that is long term?
- How does the sun provide energy to Earth's atmosphere, allowing life to exist?
- How does the ozone layer protect humans?
- How do air masses, pressure systems, and fronts cause weather to change?
- How do weather changes affect your daily activities?
- How do wind systems determine major weather patterns on Earth?
- How many climate zones does the Earth have?

Exit Skills

By the end of Module E, students should be able to:

- Identify the 7 steps of the scientific method
- Distinguish among independent variables, dependent variables, constants, and controls
- Explain how dissolved salts and other substances get in the ocean
- Describe the composition of seawater
- Explain how winds and the Coriolis effect influence surface currents
- Discuss the temperature of coastal waters
- Describe density currents
- Describe wave formation
- Analyze the formation of ocean tides
- Identify the gases in the Earth's atmosphere
- Describe the structure of the Earth's atmosphere
- Explain what causes air pressure
- Describe what happens to the energy Earth receives from the sun
- Compare and contrast heat transfer
- Explain the water cycle and its effect on the weather and climate
- Explain why different latitudes on Earth receive different amounts of solar energy
- Describe the Coriolis effect as it relates to air movement
- Locate doldrums, trade winds, prevailing westerlies, polar easterlies, and jet streams
- Explain how solar heating and water vapor in the atmosphere affect weather
- Discuss how clouds form and how they are classified

- Describe how rain, hail, sleet, snow develop
- Describe how weather is associated with front and high/low pressure areas
- Explain how different types of severe weather develop and their effects
- Explain how data are collected for weather maps and forecasts
- Identify the symbols used in a weather station model

New Jersey Student Learning Standards (NJSLS-S)

NextGen Science Standards

6-8.MS-ESS2-6	Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
6-8.MS-ESS3-1	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
6-8.MS-ESS2-5	Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.
6-8.MS-ESS3-2.1.1	Graphs, charts, and images can be used to identify patterns in data.
6-8.MS-ESS1-1.1.1	Patterns can be used to identify cause-and- effect relationships.
6-8.MS-ESS2-1.2	Developing and Using Models
6-8.MS-ESS2-6.2	Developing and Using Models
6-8.MS-ESS2-5.2.1	Cause and effect relationships may be used to predict phenomena in natural or designed systems.
6-8.MS-ESS2-5.3.1	Collect data to produce data to serve as the basis for evidence to answer scientific questions or test design solutions under a range of conditions.
6-8.MS-ESS1-3.4.1	Analyze and interpret data to determine similarities and differences in findings.
6-8.MS-ESS2-4.5.1	Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter.
6-8.MS-ESS2-2.6	Constructing Explanations and Designing Solutions
6-8.MS-ESS3-5.7.1	Stability might be disturbed either by sudden events or gradual changes that accumulate over time.
6-8.MS-ESS2-2.ESS2.C	The Roles of Water in Earth's Surface Processes

6-8.MS-ESS2-5.ESS2.C.1	The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns.
6-8.MS-ESS2-4.ESS2.C.1	Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land.
6-8.MS-ESS2-6.ESS2.C.1	Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents.
6-8.MS-ESS2-4.ESS2.C.2	Global movements of water and its changes in form are propelled by sunlight and gravity.
6-8.MS-ESS2-5.ESS2.D.1	Because these patterns are so complex, weather can only be predicted probabilistically.
6-8.MS-ESS2-6.ESS2.D.2	The ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents.
6-8.MS-ESS3-1.ESS3.A.1	Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes.
6-8.MS-ESS3-2.ESS3.B.1	Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events.
6-8.MS-ESS3-3.ESS3.C.1	Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things.
6-8.MS-ESS3-5.ESS3.D	Global Climate Change
6-8.MS-ESS3-5.ESS3.D.1	Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities.

Interdisciplinary Connections

LA.RH.6-8.1	Cite specific textual evidence to support analysis of primary and secondary sources.
LA.RH.6-8.3	Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).
LA.RH.6-8.7	Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.
MA.7.7.2	Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of

	everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems.
MA.7.7.3	Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.
MA.7.7.4	Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences.
SOC.6.1.8.B	Geography, People, and the Environment
SOC.6.3.8	Active Citizenship in the 21st Century: All students will acquire the skills needed to be active, informed citizens who value diversity and promote cultural understanding by working collaboratively to address the challenges that are inherent in living in an interconnected world.

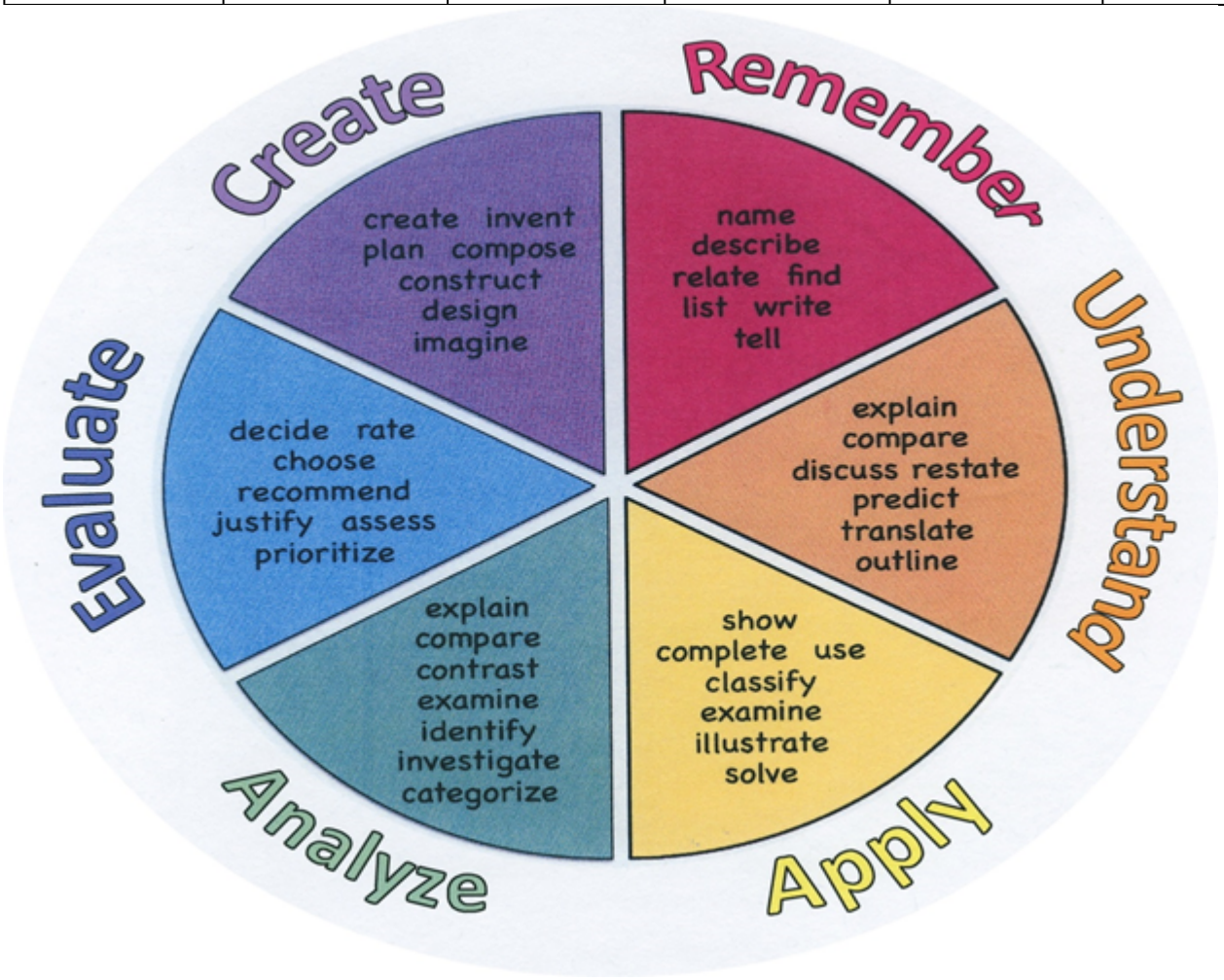
Learning Objectives

- Students will be able to use their learning of the scientific method to form conclusions on various experiments connected to the earth sciences.
- Students will be able to use their learning of ocean composition determine the differences of fresh, brackish and seawater.
- Students will be able to use their learning of ocean currents to identify that surface currents are the results of the Earth's rotation and deep ocean currents result from differences of salinity and temperate.
- Students will be able to use their learning of tides to infer that the differences in tidal heights is not just caused by the rotation of the earth but also the interactions of sun and moon
- Students will be able to use their learning to explore atmospheric conditions, as well as how humans affect weather and climate throughout their lives so that in the long run they will make smart decisions about their environment.
- Students will be able to use their learning of the atmosphere to create an analogous diagram depicting the structure of the atmosphere and the particular characteristics to explain how they impact weather and climate.
- Students will be able to use their learning of weather patterns to accurately predict the future weather for several day

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 Name Omit Recite Select State Count Draw Outline Point Quote Recall Recognize Repeat Reproduce	Give Examples Illustrate Indicate Interrelate Interpret Infer Match Paraphrase Represent Restate Rewrite Select Show Summarize Tell Translate Associate Compute Convert Discuss Estimate Extrapolate Generalize Predict	Prepare Produce Select Show Sketch Solve Use Add Calculate Change Classify Complete Compute Discover Divide Examine Graph Interpolate Manipulate Modify Operate Subtract	Point out Select Subdivide Survey Arrange Breakdown Combine Detect Diagram Discriminate Illustrate Outline Point out Separate	Contrast Critique Determine Grade Justify Measure Rank Rate Support Test	Invent Make Originate Organize Plan Produce Role Play Drive Devise Generate Integrate Prescribe Propose Reconstruct Revise Rewrite Transform



Suggested Activities & Best Practices

Utilization of various **DefinedStem.com** projects which recognizes the different learning styles of the students. DefinedStem is both problem and project-based learning.Content specific project:

- Rain Gardener
- Civil Engineering: Urban Heat Islands
- Climatologist

Utilization of **NEWSELA.com** that can be used for different leveled readers:

- Assign weekly informational text articles directly related to the lesson
- Complete reading comprehension activities on the assigned articles: quiz, power words, write

Utilization of **Google Applications**:

- Create line, bar, and/or circle graphs representing weather and climate data

Assessment Evidence - Checking for Understanding (CFU)

Summative Module E Chapter Tests given in Google Classroom (Summative)

Periodic Vocabulary Quizzes (Summative)

Lab activities and Accompanying worksheets (Summative)

Defined Stem project (Alternate)

Why It Matters charts (KWL) (Formative)

Graphic Organizer (Formative)

BrainPop quizzes on videos covering Module E (Summative)

Newsela Article/Quiz covering Module E (Summative)

HMH Workbook Highlights & Questions (Formative)

Notebook Entries & Diagrams (Alternate)

Oncourse Assessment Tools (Formative)

"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

- HMH workbook series: E and G and supplementary materials (lab kits)
- Internet resources
- 1:1 Google classroom platform: Docs, Sheet, Forms, Slides, Sites
- Video streaming: YouTube, BrainPOP, etc.

Ancillary Resources

- Outdoor area of school
- Chromebook/ 1:1 Google classroom platform

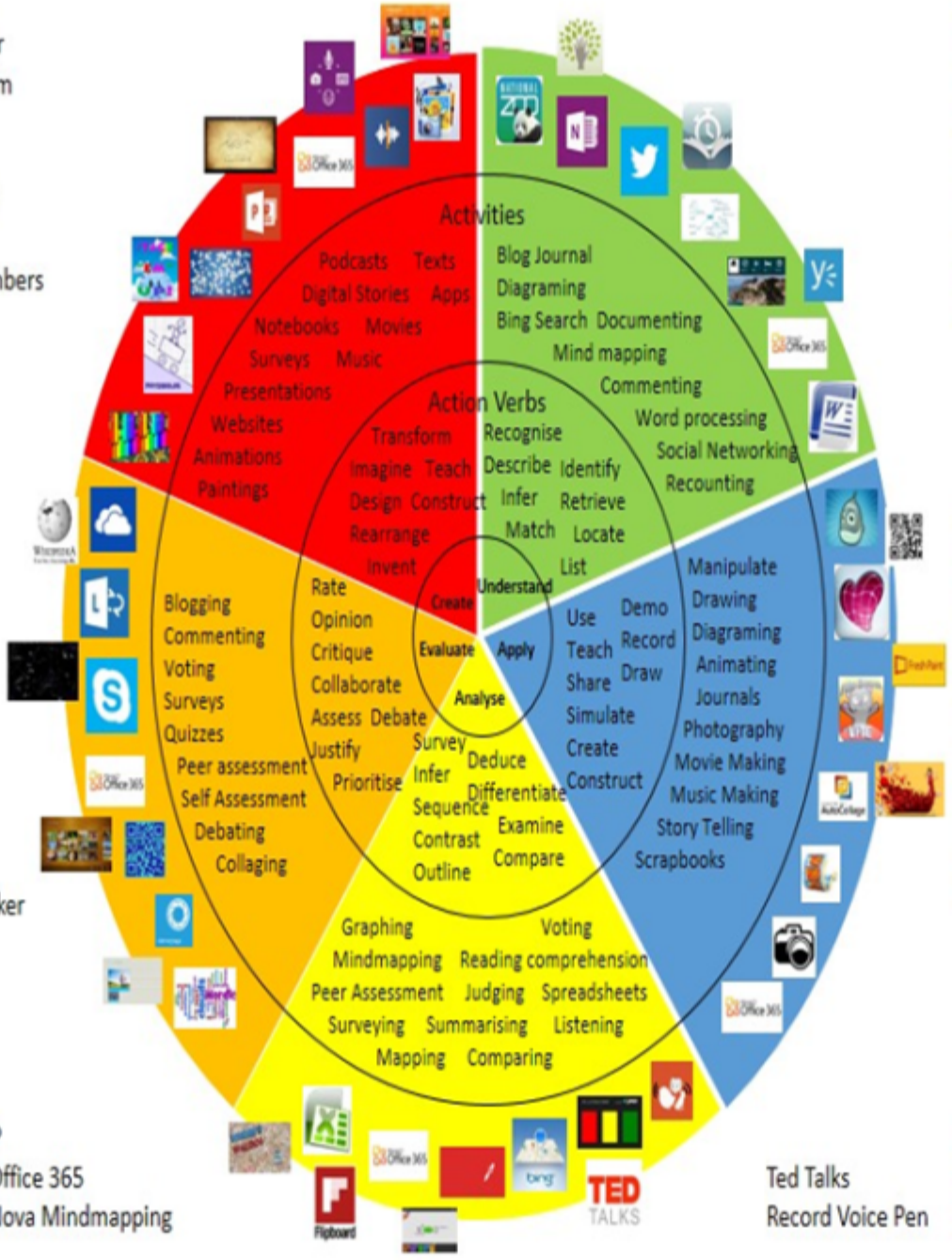
Technology Infusion

- Smart TV
- DefinedStem.com
- Pod-casts video streams
- Discovery Education video streams
- YouTube video streams
- BrainPOP video streams
- Chromebooks
- Khan Academy
- Power Point presentation
- Flipgrid
- MS Word
- Google Applications: Classroom, Docs, Sheets, Slides, Forms, Sites

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

Alignment to 21st Century Skills & Technology

Mastery of key subjects and 21st century themes is essential for all students in the 21st century. Key subjects include:

- English Language Arts
- Reading
- World Languages
- Arts
- Mathematics
- Economics
- Science
- Geography
- History
- Government and Civics
- Technology

9.4.8.CI	Creativity and Innovation
9.4.8.CI.1	Assess data gathered on varying perspectives on causes of climate change (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
9.4.8.CI.2	Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).
9.4.8.CT	Critical Thinking and Problem-solving
9.4.8.CT.1	Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
9.4.8.CT.2	Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).
9.4.8.CT.3	Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.
9.4.8.DC	Digital Citizenship
9.4.8.GCA	Global and Cultural Awareness
9.4.8.IML	Information and Media Literacy
9.4.8.TL	Technology Literacy

21st Century Skills/Interdisciplinary Themes

Please list only the **21st Century/Interdisciplinary Themes** that will be incorporated into this unit.

- 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

HMH Module E - "Take It Further" informational text readings:

1. Hydrologist
2. Snowflake Sizes and Patterns
3. People in Science
4. Exploring the Greenhouse Effect

Hands-on Activities:

- Have students jigsaw the following information: ocean currents, tides, and waves
- Have students hypothesis which sunscreen provides the best UV protection from the sun
- Have students construct an interactive notebook activity on the water cycle
- Have students construct an interactive notebook activity on global winds
- Have students graph the temperature, humidity, wind, precipitation, and air pressure of their local community for a month
- Have students construct a choropleth map to determine the frequency of tornadoes over a period of time

Differentiations:

- Small group instruction
- Extra time to complete assignments
- Pairing oral instruction with visuals
- Repeat directions
- Use manipulatives
- Center-based instruction
- Study guides
- Teacher reads assessments allowed
- Rephrase written directions

- Multi-sensory approaches
- Additional time
- Highlight text

Lo-Prep Differentiations

- Exploration by interest
- Flexible grouping
- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills
- Open-ended activities
- Think-Pair-Share

Hi-Prep Differentiations:

- Alternative formative and summative assessments
- Games and tournaments
- Group investigations
- Guided Reading
- Independent research and projects
- Interest groups
- Multiple texts
- Project-based learning
- Problem-based learning
- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products

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

Please identify the **Special Education Learning** adaptations that will be employed in the unit, using the ones identified below.

- 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)

Please identify the **English Language Learning** adaptations that will be employed in the unit, using the ones identified below.

- 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

Please identify Intervention Strategies that will be employed in the unit, using the ones identified below.

- 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)

Please identify the **Talented and Gifted** adaptations that will be employed in the unit, using the ones identified below.

- 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

Sample Lesson

Unit Name: HMH Earth's Water and Atmosphere (Module E)

NJSLS: See Link

Interdisciplinary Connection: See Link

Statement of Objective: Students will create a desalination apparatus after reading an accompanying article from **NEWSELA** entitled **"California tries one solution to water problems — treating seawater"**

Anticipatory Set/Do Now: Students will read a NEWSELA article directly related to the lesson topic and complete the activities associated with it

Learning Activity:

1 - Class discussion on article and questions
2 - Class to be divided into groups (optional grouping by grade, reading level, heterogenous etc)
3 - Student pairs will be given a tin container, saran wrap, cup (dixie), pebble, coffee filter, and a beaker.

4- Students will demonstrate the process of desalination by creating 2 classroom models.

1st pair will demonstrate the distillation based method

2nd pair will demonstrate the reverse osmosis method. Each will assemble their models using items on the materials list

5- Students will create an illustration depicting how water and salt travels in both desalination processes (distillation & reverse osmosis).

Student Assessment/CFU's: See Link - As an exit ticket- all students will explain the following questions:

- What is the purpose of a desalination apparatus?
- What purpose does the saran wrap serve in the desalination apparatus?
- What purpose does the pebble serve?

Materials:

1. Chromebooks
2. NEWSELA article
3. Aluminum tray
4. Saran wrap
5. Cup (dixie)
6. Pebble
7. Coffee filter
8. Beaker

21st Century Themes and Skills: See Link

Differentiation: See Link (Groups determined according to interest with at least one proactive student within each group to take initiative and try to construct the desalination apparatus.)

Integration of Technology: Teacher laptop, Smart TV, Chromebook, NEWSELA, Google Classroom