MP3-Earth's Systems

Content Area: **Science**
Course(s): **Science 5**
Time Period: **Marking Period 3**
Length: **MP 3**
Status: **Published**

Essential Questions

- Where is most of the Earth's water that is usable to humans?
- What are the four major systems that make up the Earth and how do they interact?
- What are the four layers of the Earth and what are the characteristics of each?
- How do humans impact the Earth and how can we reduce it?
- What is global change?

Big Ideas

- Four major earth systems interact.
- Rainfall helps to shape the land and affects the types of living things found in a region.
- Water, ice, wind, organisms, and gravity break rocks, soils, and sediments into small pieces and move them around.
- Most of earth's water is in the ocean, in glaciers or underground.
- Societal activities have had major effects on the land, ocean, atmosphere and even outer space. Societal activities can also help protect earth's resources and environments.

CRLLKS- 21st Century

9.4.5.DC.8: Propose ways local and global communities can engage digitally to participate in and promote climate action (e.g., 6.3.5.GeoHE.1).

Connection: Students can work together to research and create pamphlets/posters stressing the importance of climate change in our community.

Cross-Curricular Integration

Integration Area: Math

5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the

coordinate plane, and interpret coordinate values of points in the context of the situation.

Activity:

Students will look at data that describes the forecasted temperature versus the actual temperature. Students will graph the points using the first quadrant on the coordinate grid. Students will compare the data and graphs.

Student Learning Standards

ELA/Literacy

RI.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. (4-ESS3-2)
RI.4.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. (4-ESS2-2)
RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. (4-ESS3-2)
W.4.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. (4-ESS1-1),(4-ESS2-2)
W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. (4-ESS1-1),(4-ESS2-1)
W.4.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (4-ESS1-1)

Mathematics
MP.2 Reason abstractly and quantitatively. (4-ESS1-1),(4-ESS2-1),(4- ESS3-2)
MP.4 Model with mathematics. (4-ESS1-1),(4-ESS2-1)(4-ESS3-2)
MP.5 Use appropriate tools strategically. (4-ESS2-1)
4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm, kg, g, lb., oz, l, ml, hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit/ Record measurement equivalents in a two-column table. (4-ESS1-1), (4-ESS2-1)
4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimanl, and promblems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. (4-ESS2-1)

4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations. (4-ESS3-2)

Social Justice

See Social Studies Appendix C

Book 1: Schomburg The Man Who Built a Library by Carole Boston Weatherford (Read Across America) **On EPIC**

Book 2: Catching the Moon: The Story of a Young Girl's Baseball Dream by Crystal Hubbard (Women's History)

CSDT Technology Integration

8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.

Activity:

Students will work in lab groups to collect and analyze data on the distribution of Earth's fresh and salt water to identify solutions and make informed decisions on the use of water. Students will use a digital graphics program to develop charts, graphs, and pictures to support their findings. Students will present their data, analysis, and possible solutions to the class.

Science and Engineering Practices

Planning and Carrying Out Investigations

- Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.
- Make predictions about what would happen if a variable changes.
- Test two different models of the same proposed object, tool, or process to determine which better meets criteria for success.

Engaging in Argument from Evidence

- Distinguish among facts, reasoned judgment based on research findings, and speculation in an explanation.

Obtaining, Evaluating, and Communicating Information

- Read and comprehend grade-appropriate complex texts and/or other reliable media to summarize and obtain scientific and technical ideas and describe how they are supported by evidence.
- Compare and/or combine across complex texts and/or other reliable media to support the engagement in other scientific and/or engineering practices.
- Communicate scientific and/or technical information orally and/or in written formats, including various forms of media and may include tables, diagrams, and charts.

Asking Questions and Defining Problems

- Ask questions about what would happen if a variable is changed.
- Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.

Analyzing and Interpreting Data

- Represent data in tables and/or various graphical displays (bar graphs, pictographs, and/or pie charts) to reveal patterns that indicate relationships.

Using Mathematics and Computational Thinking

- Organize simple data sets to reveal patterns that suggest relationships.

Enduring Understandings

Earth's Systems

5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

5-ESS2-2 Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

Earth and Human Activity

5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.

Focus Areas

Knowledge

- Earth is a nonliving object that is made up of four major systems.
- The Earth’s geosphere is composed of four distinct layers.
- Animals and plants rely on each other to create the gases needed for survival.
- The ozone layer protects us from the Earth’s harmful UV rays.
- The vast majority of water on Earth is salt water and unusable. Most of the water that is usable is trapped in glaciers.
- Areas that are near water will have milder climate changes because the ocean will slowly absorb and release heat.
- How humans negatively impact Earth systems.
- How humans positively impact Earth systems.

- The impacts of human activities and consumption of natural resources.

Skills

- Explain the four major systems of the Earth.
- Differentiate between the different layers of the Earth based on distinct characteristics.
- Explain the relationship between plants and animals when it comes to the production of oxygen and carbon dioxide.
- Describe how life on Earth would be different if the ozone layer continues to be depleted.
- Interpret and create graphs that represent the location of both salt and fresh water on Earth.
- Analyze lab results that suggest that areas near water will see milder temperature fluctuations than areas that are further inland.
- Describe humans' impact on Earth systems.
- Explain the impact that increasing human populations have on natural resources.
- Identify changes humans can make to lessen their impact on the Earth's systems.

Understanding

- Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
- Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
- Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Climate Change

4-ESS3-2: Generate and compare multiple solutions to reduce the impacts of natural Earth processes and climate change have on humans.

- Activity: Students will work in groups to research one natural Earth process or climate change impact to focus on (e.g., coastal flooding due to sea level rise, wildfires due to drought). Students will create a presentation with as many solutions as possible.

5-ESS2-1: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

- Activity: Students will demonstrate and explain interactions among Earth's spheres (geosphere, biosphere, hydrosphere, atmosphere) using a physical model.

Resources

Primary Resource

Scott Foresman Interactive Science, Pearson, 2016

- Chapter 4- Ecosystems, Lesson 4
- Chapter 5- The Water Cycle and Weather, Lessons 5,6

Leveled Readers

- *Changing World*
- *Water on Earth*
- *Earth's Water*
- *Our Changing Earth*
- *Earth's Changing Surface*
- *Protecting Earth's Resources*
- *Earth's Natural Resources*
- *Green Gardening*

Scientific Inquiry

Core

- How do the spheres interact?
- Compare fresh water and salt water distribution.
- How can you protect Earth's resources and environment?

Supplemental

- How accurate is the weather forecast? p.216
- Does a cloud form? p.224