

Grade 5 Unit 2

Water on Earth

Mid/End November - Late January/MP 2

Unit Summary:

- The unit on matter helps students develop the idea that the Earth is a complex and dynamic set of interconnected systems (e.g. geosphere, hydrosphere, atmosphere, biosphere) that interact in multiple ways to affect the Earth's surface and processes.
- Understandings to include:
 - The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate.
 - Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.
 - Most freshwater is in glaciers or underground with the remainder in streams, lakes, wetlands, and atmosphere.
 - Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation as well as downhill flows on land.
 - The Earth's processes affect and are affected by human activities

Concepts	Vocabulary
<ul style="list-style-type: none"> ● Standard units are used to measure and describe physical quantities such as weight and volume. ● Nearly all of Earth's available water is in the ocean. ● Most freshwater is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere 	<p>Hydrosphere, organisms, glaciers, transpiration, evaporation, condensation, precipitation, groundwater, well, stomata</p>

Stage 1 – Desired Results (Also see Disciplinary Core Ideas below)

Performance Expectations: (PE) (Established Goals / Content Standards)

- **5-ESS2-1: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.**
 - **Clarification Statement:** Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.
 - **Assessment Boundary:** Assessment is limited to the interactions of two systems at a time.
- **5-ESS2-2. Describe and graph the amounts of saltwater and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.**
 - **Assessment Boundary:** Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.] The performance expectations above
- **5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment**

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Developing and Using Models</p> <ul style="list-style-type: none"> Develop a model using an example to describe a scientific principle. (5-ESS2-1) <p>Obtaining, Evaluating, and Communicating ESS2.A: Earth Materials and Systems</p> <ul style="list-style-type: none"> Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things). <p>Systems and System Models</p> <ul style="list-style-type: none"> A system can be described in terms of its components and their interactions. (5-ESS2-1),(5-ESS3-1) 	<p>ESS2.C: The Roles of Water in Earth's Surface Processes</p> <ul style="list-style-type: none"> Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5-ESS2-2) <p>ESS3.C: Human Impacts on Earth Systems</p> <ul style="list-style-type: none"> Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1) 	<p>Scale, Proportion, and Quantity</p> <ul style="list-style-type: none"> Standard units are used to measure and describe physical quantities such as weight and volume. (5-ESS2-2) <p>Systems and System Models</p> <ul style="list-style-type: none"> A system can be described in terms of its components and their interactions. (5-ESS3-1) <p>Science Addresses Questions About the Natural and Material World</p> <ul style="list-style-type: none"> Science findings are limited to questions that can be answered with empirical evidence. (5-ESS3-1)

<p>Enduring Understandings</p> <ul style="list-style-type: none"> Understandings to include: <ul style="list-style-type: none"> Earth's major systems are the geosphere, hydrosphere, and biosphere, which interact in multiple ways to affect the Earth's surface materials and processes. Human activities in agriculture, industry, and everyday life have had major effects on land, vegetation, streams, ocean, and air. Natural bodies of water support a variety of ecosystems and organisms, shapes landforms, and influences 	<p>Essential Questions</p> <ul style="list-style-type: none"> How and why is Earth constantly changing? How do Earth's processes and human activities affect each other? How and why is Earth constantly changing from the effect of water energy?
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Stage 2 – Model Assessments

<p>Summative Performance Task(s):</p> <ul style="list-style-type: none"> Develop a model to describe the ways the geosphere, hydrosphere, and biosphere interact. (5-ESS2-1) Develop a model to describe the ways the 	<p>Formative Evidence:</p> <ul style="list-style-type: none"> (Suggested) 2-4 question comprehension checks Teacher observation Class Discussion/ Anecdotal notes
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geosphere, hydrosphere, and biosphere interact. This could include the influence of atmosphere on landforms and ecosystems though weather and climate, mountain ranges on winds and clouds, etc. (5-ESS2-1)

● **Audience:**

- Peers/ teacher

Criteria:

- Rubric, observation, self reflection

- (possible) Mystery Science end-of-mystery assessment
- Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
- Using real time data, graph amounts of water in various reservoirs to provide evidence about the distribution of water on earth.

Stage 3 – Learning Plan Resources and Activities

Suggested Resources for Planning:

- **Mystery Science**
- **NewsELA**
- **Super Science**
- **Brainpop**
- <https://www.getepic.com/> (free)
- **Scholastic**
- **NJCTL.org**
- thewonderofscience.com
- **other free online resources**
- **Scholastic Study Jams Water Cycle:**
<http://studyjams.scholastic.com/studyjams/jams/science/ecosystems/water-cycle.htm>
- **Scholastic Study Jams Weather and Climate:**
<http://studyjams.scholastic.com/studyjams/jams/science/weather-and-climate/water-cycle.htm>
- **United States Environmental Protection Agency (various activities):**
https://www3.epa.gov/safewater/kids/kids_4-8.html
- **The Water Project activities:** https://thewaterproject.org/resources/the_water_cycle

Learning Activities:

- Map areas where frozen, fresh, and salter are found and evaluate findings to arrive at conclusions
- Investigate where inland areas get fresh water from
- Create evaporation cycle to simulate rain
- Brainstorm ways to protect areas against water-related disasters
- Mystery Science mysteries
 - **Watery Planet (Water Cycle and Earth's Systems)**
 - **Mystery: Water on Earth's Surface** [How much water is in the world?](#)
 - **Mystery: Water as a Natural Resource** [When you turn on the faucet, where does the water come from?](#)
 - **Mystery: Water Cycle** [Can we make it rain?](#)
 - **Mystery: Natural Disasters and Engineering** [How can you save a town from a hurricane?](#)

Suggested Methods: (The following methods anchor learning with a purpose, mitigating the “why do I need to know this” questions.)

- Phenomena based learning
- Problem Based Learning (PBL)
- Inquiry Based Learning
- Case studies
- Engaging in Argument w/ evidence