FIFTH GRADE: WATER/CONSERVATION

Standards Bundle

Standards are listed within the bundle. Bundles are created with potential instructional use in mind, based upon the potential for related phenomena that can be used throughout a unit.

5-ESS2-2 Describe and graph the amounts and percentages of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. (SEP: 4; DCI: ESS2.C; CCC: Scale/Prop.) [*Assessment Boundary: Assessment is limited to oceans, lakes, rivers, glaciers, groundwater, and polar ice caps, and does not include the atmosphere.*]

5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment. (SEP:8; DCI: ESS3.C; CCC: Systems)

Content Overview

This section provides a generic overview of the content or disciplinary core ideas as an entry point to the standards.

Most of Earth's water is unusable and found in oceans, while a small amount of freshwater is accessible to humans.

Phenomena

Phenomena can be used at varying levels of instruction. One could be used to anchor an entire unit, while another might be more supplemental for anchoring just a unit. Please remember that phenomena should allow students to engage in the SEP and use the CCC/DCI to understand and explain the phenomenon.

- Human uses of water impact our water resources.
- Observe a globe or map of the earth.
- A map indicating areas of the world where water is scarce.
- Shower heads and toilets now use less water than in previous decades.

Storyline

This section aims to decode not only the DCI connections but also the SEP and CCC in a detailed account of how they possibly fit together in a progression for student learning, including both rationale and context for the bundle.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Using Mathematics and Computational Thinking ● Describe and graph quantities such as area and volume to address scientific questions. **Obtaining, Evaluating, and Communicating Information** ● Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.	**ESS2.C: The Roles of Water in Earth's Surface Processes** ● 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. **ESS3.C: Human Impacts on Earth Systems** ● 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.	**Scale, Proportion, and Quantity** ● Standard units are used to measure and describe physical quantities such as weight and volume. **Systems and System Model**s ● A system can be described in terms of its components and their interactions.

Students have an opportunity to examine Earth's systems and their interactions. They can then take a closer look at the distribution of water on Earth to further consider its impact on other Earth systems. Students can obtain and evaluate information to determine that even though oceans hold most of the water on Earth, it is saltwater, and not fresh, and most of the freshwater on Earth is found underground and in glaciers while, a very small percentage is found in rivers, lakes, streams, and the atmosphere. Students use mathematical thinking to create graphs to model the percentage of freshwater on earth that is available compared to the distribution of saltwater sources around the world. Students can use water distribution data to address questions about water usage and water preservation measures. Using this data, students will make claims that although water can be recycled, it is finite and not a renewable resource. Students can also construct arguments for why it is important to preserve the water we currently have available for human use.

In identifying the distribution of freshwater and saltwater on Earth, students will think about the vast amounts of saltwater found on Earth in oceans and how the oceans support a unique and expansive number of living organisms. For example, there are many groups of living organisms in the oceans that are not visible anywhere else on Earth (squid, octopus, jellyfish, and seaweed). Oceans support unique ecosystems like coral reefs that provide shelter and food for many ocean organisms. Students will consider how the hydrosphere (in the form of saltwater in the ocean) interacts with the other Earth systems.

Agricultural and industrial practices can greatly influence a variety of ecosystems found on land, in streams, oceans, and the atmosphere. Students can use reliable sources from text and media to investigate the practices that humans use to protect Earth's resources and the environments they are found in (e.g., the use of natural fertilizers, replanting, and rotation of trees by the logging industry, as well as recycling programs).

Formative Assessment

Formative assessment is crucial because all learners benefit from timely and focused feedback from others. It promotes self-reflection, self-explanation, and social learning. It can also make learning more relevant. Each of the questions below might be used throughout the formative assessment process. Specific prompts may focus on individual practices, core ideas, or crosscutting concepts, but, together, the components need to support inferences about students' three-dimensional science learning as described in a given bundle, standard, or lesson-level performance expectation.

SEP Using Mathematics and Computational Thinking

- Graph the distribution of the Earth's water.

SEP Obtaining, Evaluating, and Communicating Information

- Make a poster that describes the amounts and percentages of water and freshwater that are distributed on Earth.
- How are communities that do not have easy access to water getting water to their community?

CCC Scale, Proportion, and Quantity

- Interpret data to understand water distributions on Earth.
- What is the ratio of freshwater to saltwater? Of usable water to unusable water?

CCC Systems and System Models

- What are some ideas your family or community are using to conserve water?

Performance Outcomes

These are statements of how students use knowledge and are similar to the standards in how they blend DCI, SEP, and CCC, but at a smaller grain size. These are potential outcomes for instruction as it plays out in lessons and activities in the classroom. It is important to also think of these as smaller outcomes that build toward the larger goal of mastering the standards.

- **Describe and graph the amounts and percentages** of *water and freshwater* that is distributed on Earth.
- **Graph quantities** such as **area and volume** to prove that nearly all of Earth's available water is contained in *Earth's oceans*.
- **Create a model** to **compare** the **amounts** *of ocean water and freshwater on* Earth.
- **Obtain information** from a variety of sources to determine how the ocean supports *a variety of ecosystems and organisms.*
- **Construct an argument using evidence** to explain that *although fresh water is renewable, it is a finite source and should be preserved*.
- **Evaluate** ways in which communities around the world are using science to protect their *water resources*.