

Unit 4: A Deeper Dive: Water Around the World

5th Grade Science

35 Class Meetings

Written January 2026

Essential Questions

- Why do some communities have easy access to clean water while others do not?
- How can data and models help us understand global water distribution and access?
- How can engineering efforts help with the distribution of water?

Enduring Understandings with Unit Goals

EU 1: Access to clean water is not equal across the world.

- Communities' access to clean water depends on geography, climate, natural resources, and human-built systems.
- Economic resources, infrastructure, and government decisions affect how easily water can be collected, cleaned, and delivered.
- Limited access to clean water impacts health, daily life, and community well-being.

EU 2: Data and models help explain how water is distributed on Earth.

- Data can show how much water is available and where it is located across the planet.
- Graphs, maps, and models help scientists compare water availability between regions.
- Using evidence from data allows people to better understand patterns and problems related to water access.

EU 3: Engineering solutions can improve access to clean water.

- Engineers design systems to collect, store, clean, and transport water to communities.
- Design solutions must consider cost, materials, environmental impact, and community needs.
- Testing and improving designs helps increase the reliability and safety of water distribution systems.

Standards

Common Core State and NGSS Standards:

- **5-ESS2-1.** Earth's Systems Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
- **5-ESS2-2.** Earth's Systems 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.
- **3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- **3-5-ETS1-3.** Plan and carry out fair tests in which variables are controlled, and failure points are considered to identify aspects of a model or prototype that can be improved.
- **CCSS.ELA-Literacy.RI.5.1:** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
- **CCSS.ELA-Literacy.RI.5.2:** Determine the main idea of a text and explain how it is supported by key details; summarize the text.

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- **CCSS.ELA-Literacy.RI.5.4:** Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.
- **CCSS.ELA-Literacy.RI.5.9:** Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.
- **CCSS.ELA-Literacy.W.5.2:** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- **CCSS.ELA-Literacy.W.5.2.a:** Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.
- **CCSS.ELA-Literacy.W.5.2.b:** Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.
- **CCSS.ELA-Literacy.W.5.2.c:** Link ideas within categories of information using words and phrases (e.g., *another, for example, also, because*).
- **CCSS.ELA-Literacy.W.5.2.d:** Use precise language and domain-specific vocabulary to inform about or explain the topic.
- **CCSS.ELA-Literacy.W.5.2.e:** Provide a concluding statement or section related to the information or explanation presented.
- **CCSS.ELA-Literacy.W.5.4:** Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience
- **CCSS.ELA-Literacy.W.5.5:** With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.
- **CCSS.ELA-Literacy.W.5.6:** With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.
- **CCSS.ELA-Literacy.W.5.7:** Conduct short research projects that build knowledge through investigation of different aspects of a topic.
- **CCSS.ELA-Literacy.W.5.8:** 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.
- **CCSS.ELA-Literacy.W.5.9:** Draw evidence from literary or informational texts to support analysis, reflection, and research.
- **CCSS.ELA-Literacy.SL.4.1:** Engage effectively in a range of collaborative discussions (one-on one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.
- **CCSS.ELA-Literacy.SL.5.1.a:** Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
- **CCSS.ELA-Literacy.SL.5.1.b:** Follow agreed-upon rules for discussions and carry out assigned roles.
- **CCSS.ELA-Literacy.SL.5.1.c:** Pose and respond to specific questions to clarify or follow up on information and make comments that contribute to the discussion and link to the remarks of others.

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- **CCSS.ELA-Literacy.SL.5.1.d:** Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
- **CCSS.ELA-Literacy.SL.5.2:** Paraphrase portions of a text read aloud, or information presented in diverse media and formats, including visually, quantitatively, and orally.
- **CCSS.ELA-Literacy.SL.5.3:** Identify the reasons and evidence a speaker provides to support particular points.
- **CCSS.ELA-Literacy.SL.5.4:** Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.

Competency 2: Speak to diverse audiences in an accountable manner.

Competency 3: Develop the behaviors needed to interact and contribute with others on a team.

Competency 4: Analyze and solve problems independently and collaboratively.

Competency 5: Be responsible, creative, and empathetic members of the community.

Unit Content Overview

1. Unequal Access to Clean Water

- Investigate how geography, climate, and natural resources affect water availability in different regions.
- Examine how infrastructure, economics, and government decisions influence access to clean water.
- Analyze real-world examples of communities with abundant water access compared to those experiencing water scarcity.
- Explain how limited access to clean water impacts health, daily life, and community well-being.

2. Using Data and Models to Understand Water Distribution

- Analyze data showing the global distribution of saltwater and freshwater.
- Investigate freshwater reservoirs, including glaciers, groundwater, lakes, rivers, and the atmosphere.
- Create and interpret pie charts, bar graphs, and maps to represent water availability.
- Use models to explain patterns in water distribution and access around the world.

3. Engineering Solutions for Water Distribution

- Identify water-related challenges faced by different communities.
- Define design problems related to collecting, cleaning, or transporting water.
- Generate and compare multiple engineering solutions using criteria and constraints.
- Build, test, and improve models or prototypes designed to increase access to clean water.

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Vocabulary and Key Terms: Hydrosphere, atmosphere, geosphere, biosphere, water cycle, evaporation, condensation, precipitation, runoff, infiltration, reservoir, freshwater, saltwater, groundwater, glacier, aquifer, distribution, accessibility, scarcity, pollution, model, data table, bar graph, pie chart, percentage, system, interaction, human impact

Interdisciplinary Connection:

- ELA, Math, Humanities

Daily Learning Objectives with *TWPS*

Students will be able to...

- Observe images and videos showing water access in different communities around the world.
 - *What differences do you notice in how people get water? What do you wonder?*
- Identify factors that affect access to clean water (geography, climate, resources).
 - *How might where people live affect their access to water?*
- Compare communities with abundant water to those facing scarcity.
 - *Why do some communities have more water available than others?*
- Examine how water access impacts health and daily life.
 - *How might limited access to clean water affect families and communities?*
- Read and discuss a global case study about water scarcity. **
 - *What challenges does this community face?*
 - *What evidence from the text supports your thinking?*
- Review Earth's total water supply and identify saltwater vs. freshwater.
 - *How much of Earth's water is actually freshwater?*
- Analyze data showing where freshwater is stored on Earth.
 - *Which freshwater sources are most common? Which are hardest to access?*
- Create pie charts representing the percentage of saltwater and freshwater.
 - *What does your graph show about water availability?*
- Construct bar graphs comparing freshwater reservoirs.
 - *What patterns do you notice in the data?*
- Use a model to explain how water moves and is stored in Earth's systems. **
 - How does this model help explain water distribution?
 - What are the limits of this model?
- Interpret maps showing global water access.
 - How does access to water vary by region?
- Identify a real-world problem related to access to clean water.
 - *What problem is this community trying to solve?*
- Define criteria and constraints for a water access solution.
 - *What must the solution do? What limits the design?*
- Brainstorm multiple engineering solutions to improve water access.
 - *Which ideas seem most effective and why?*
- Select and justify a design plan using evidence.
 - *How does your design meet the criteria?*

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- Build a model or prototype to improve water access. **
 - *How does your model help solve the problem?*
- Test and revise the design based on results.
 - *What worked well? What needs improvement?*
- Explain how engineering can help communities access clean water.
 - *How can engineering make a real-world impact on people's lives?*

Instructional Strategies/Differentiated Instruction

- Whole group instruction
- Paragraph frames and sentence starters
- Teacher modeling
- Think-write-pair-share and small-group discussions
- Graphic organizers
- Accountable talk
- Homework
- Word walls with visuals (Venn Diagrams)
- Small group instruction
- Visual exemplars with teacher and student critiques
- Text and video chunking
- Spiraling back to guiding questions
- Close reading with text-dependent questions

EL Differentiation Strategies

- Key vocabulary, Word Banks and Word Walls with visuals
- TWPS (Think, write, pair, share)
- Pre-reading strategies
- Culturally responsive teaching
- Explicit teacher modeling
- Graphic organizers
- Strategic Grouping
- Non-verbal assessments

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Assessments

FORMATIVE ASSESSMENTS:

- Do Now
- Academic Discourse
- Exit Slips
- Accountable Talk Discussions
- Completed notes
- Completed graphic organizers
- Homework
- Performance Task – “Water for the World: Designing Solutions for Access”
 - Teacher’s rubric/scoring guide

SUMMATIVE ASSESSMENTS:

- Quiz: Access to Clean Water, Data and Models to Understand Water Distribution (EU1 and EU2)
- Unit Task: “Water for the World: Designing Solutions for Access” (EU1 and EU2)

Unit Task

Unit Task Name: Water for the World: Designing Solutions for Access

Description: Students will take on the role of Water Systems Engineers tasked with helping a fictional community gain access to clean, reliable water. Using real-world data, Earth system models, and engineering design practices, students will analyze the problem, design a solution, and communicate their thinking through a creative final product.

Evaluation: Teacher’s Scoring Guide

Unit Resources

- NewsEla
- Google Slides (Teacher’s)
- Student Journals
- Chromebooks
- ReadWorks
- Virtual Fieldtrips
- Google Classroom
- Mystery Science