

Unit 4: A Deeper Dive: Water Around the World

5th Grade Science

25/35 Class Meetings

Revised June 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.

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.

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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.

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

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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?*
- 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.

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| <ul style="list-style-type: none">○ <i>How can engineering make a real-world impact on people's lives?</i> |
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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