

Focus Question 1: Where does the water you need come from?

Lesson 1: H2GO

Accessing freshwater is a problem.

Students define the problem of freshwater not being available where it is needed. Students design and test a system for moving water a short distance.

Lesson 2: Water Footprint

Human activities require freshwater.

Students analyze and interpret data in order to construct explanations about how much water is required to produce different foods. Students learn how the food they eat, activities they participate in, and materials they use all affect their own water footprint.

Lesson 3: Our Water Picture

Freshwater is limited and not easily accessible.

Students use a model to create a graph that shows how little freshwater is available compared to the large amount of water on Earth. Students define the problem of humans' need for freshwater and the limited amount of freshwater available.

Lesson 4: Water Scarcity Explored

Water scarcity is a global problem.

Students analyze and interpret data showing the scale of the global water scarcity issue and communicate their findings in a public service announcement.

Focus Question 2: How have humans impacted the water we need?

Lesson 5: Water Pump

Identifying failure points informs how to improve a design.

Students consider the structure and function of various tools in order to design a solution for pumping groundwater to the surface. Students communicate possible solutions to failure points encountered during system testing.

Lesson 6: The Global Water Connection

Humans impact Earth's four spheres.

Students evaluate informational text in order to communicate information with peers about a particular

sphere of the Earth. Students explain how one component of the Earth system is affected by or affects humans.

Lesson 7: Water Web

Earth's four spheres interact.

Students develop a model by connecting the components of Earth's four spheres. Students use that model to make predictions about the effects of possible future events.

Lesson 8: Clean the Water- Design it

Human activities impact groundwater.

Students develop a model to show how human activities interact with components of the Earth system to cause groundwater pollution. Students design a solution to a water pollution problem.

Lesson 9: Clean the Water- Test it

Design solutions should be compared based on how well they meet the criteria.

After testing water treatment systems, students analyze and interpret quantitative data in order to compare different design solutions. Students use evidence to construct an explanation about which solution best meets different criteria.

Focus Question 3: How have humans tried to solve the problem of getting freshwater to where it's needed?

Lesson 10: Aquation

Human activities impact water availability and distribution.

Groups of students use a model simulation to define the problem and design a solution to the water scarcity and water equity problem using existing technologies.

Lesson 11: Unintended Consequences- Read All About It!

Human activities can have unintended consequences.

Students obtain and evaluate information from two different perspectives on the cause and effects of the Aral Sea environmental crisis.

Lesson 12: Unintended Consequences- Write All About It!

Human activities can have unintended consequences.

Groups of students evaluate and communicate information on the cause and effects of the Aral Sea environmental crisis.

Focus Question 4: How can we provide freshwater to agriculture, industry, the environment, and housing in your town?

Lesson 13: Water Ready

Earth's four spheres interact.

Students prepare for a design challenge by developing and using models to show the interactions of groundwater with other components of the Earth system. Students communicate a strategy to preserve water to a specific stakeholder.

Design Challenge

Lesson 14: Get It, Treat It, Share It Part 1

Communication with peers is an important part of the design process.

Groups of students evaluate information about a specific town in order to design a solution for accessing and treating water that meets specific criteria and constraints. Students analyze and interpret data to figure out effects of design choices in previous testing.

Lesson 15: Get It, Treat It, Share It Part 2

Identifying a failure point informs how to improve a design.

Groups of students carry out a live system test and analyze and interpret their findings. Groups communicate failure points that affected the overall system and a possible solution to that failure point.