



Humans depend on water, and our need for this precious resource is growing alongside our population. How will we meet the needs of the future without harming the environment? In this series, we'll explore key water issues, the water cycle, and some of the technology and techniques used to conserve water.



### [Your Hidden Water Footprint: Defining a Problem to Find a Solution](#)

In this lesson, students will practice putting a design problem into perspective. In this case, the class will explore the often surprising amount of water used in producing everyday products like cola, leather boots, smartphones, and chocolate bars.



### [Video: How Do We Meet the Growing Need for Water?](#)

In this video, we'll explore environmental issues related to water conservation.



### [Exploring Our Growing Need for Water](#)

In this two-day lesson, students will be introduced to several water sustainability issues, including access to clean freshwater, groundwater depletion, agricultural water use, and water waste.



### [Rapid Brainstorming: How Can We Conserve Our Water Resources?](#)

In this lesson, students will practice rapid ideation—an important step in design thinking—by brainstorming solutions to issues surrounding global water use and conservation.



### [Sustainable Water Solutions: Weighing the Pros and Cons](#)

In this activity, students will work together to map out the strengths and limitations of potential solutions to some important water use and conservation issues.



### **Videos:**

- [Desalination: From Sea to Sink](#)
- [Water-Wise Farms: How to Grow More Crop Per Drop](#)
- [Waste Water Recycling: Putting Greywater to Good Use](#)
- [Recharging Aquifers: Replenishing our Groundwater Resources](#)



### [Fresh Solutions: Design Thinking Challenge](#)

Are your students ready to tackle a water conservation issue at home or in their school? This guide will help you facilitate a structured design challenge in your classroom related to water use at home, at school, or in the community.

## [Fresh Solutions](#)



# Fresh Solutions

## Connections to Standards



Each video and lesson in this unit has been designed to support the Next Generation Science Standards; however, the NGSS connections are stronger when these resources are used together as a full unit. Below, we've outlined the NGSS Performance Expectations (PEs) this unit builds towards and the specific Disciplinary Core Ideas, Science and Engineering Practices, and Crosscutting Concepts that most directly support these PEs:

### Performance Expectations (Grades 6-8)

- **MS-ESS3-3:** Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
- **MS-ESS3-4:** Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
- **MS-ETS1-1:** Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

### Disciplinary Core Ideas (Grades 6-8)

- **MS-ESS3.C: Human Impacts on Earth Systems**
  - Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.

### Science and Engineering Practices (Grades 6-8)

- **Analyzing and Interpreting Data**
  - Analyze and interpret data to determine similarities and differences in findings.
  - Use graphical displays of large data sets to identify temporal and spatial relationships.
- **Obtaining, Evaluating, and Communicating Information**
  - Integrate qualitative and/or quantitative scientific and/or technical information in written text with that contained in media and visual displays to clarify claims and findings.
  - Communicate scientific and/or technical information in writing and/or through oral presentations.
- **Designing Solutions**
  - Undertake a design project, engaging in the design cycle, to construct and/or implement a solution that meets specific design criteria and constraints.

### Crosscutting Concepts (Grades 6-8)

- **Influence of Science, Engineering, and Technology on Society and the Natural World**
  - All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment.

