

**RESOURCE LIBRARY**

ACTIVITY : 1 HR 15 MINS

## A Day Without Water

Students engage in a thought experiment about their access to tap water and estimate their daily water use. Students analyze an infographic featuring United Nations data on water access and sanitation to see what access to clean water looks like for people around the world. Students learn about “Day Zero” and watch a short video about water conservation from National Geographic explorers to understand the urgency of water security.

**GRADES**

6 - 8

**SUBJECTS***Biology, Conservation, Earth Science, Climatology, Geography, Physical Geography***CONTENTS**

2 Resources, 1 Video, 2 PDFs

## OVERVIEW

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For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/day-without-water/>

## In collaboration with

# DIRECTIONS

This activity is part of the Peak Water: Mount Everest and Global Water Supply unit.

## 1. Engage students in a thought experiment to elicit their understanding of their own water usage.

- Ask students to discuss with a partner: *What would happen if you turned on the tap at home and no water came out? What would you do? What if your whole community had no clean water?*
- Prompt students to share ideas and questions in a whole-class discussion.
- Ask students to discuss in pairs and record (on chart paper or scratch paper) when they (or their families) use water throughout the day.
  - Examples of responses may include: showering, brushing their teeth, washing their hands, flushing the toilet, cooking, drinking, laundry, or washing the car.
- On one piece of chart paper for the class, have students write down an estimate of how much water they use in a day, in gallons or liters.
- Discuss the estimates as a class. Ask students if they think the estimates are too high or too low. Ask them how they think those numbers compare to students' water usage around the world.

## 2. Introduce students to the Sustainable Development Goals and Goal 6: Clean Water and Sanitation.

- Share that, on average, United States residents use about 302-378 liters (80-100 gallons) of water per person per day. Ask students if they think everyone uses the same amount of water around the world. Introduce students to the Sustainable Development Goals (SDGs) before reading the Goal 6: Clean Water and Sanitation encyclopedic entry as a class. Ask what is surprising or interesting about this initiative.
- Share the Clean Water and Sanitation: A Global Report Card infographic. Have students review the infographic and discuss in pairs what is interesting or surprising to them.
- Introduce the term "Day Zero" with regards to water: the day when citizens run out of clean drinking water.
  - Use Cape Town and India as examples of places that are experiencing crises in accessing reliable water sources.

- Distribute the *Project Journal: A Day Without Water*. Direct students to respond to the first three prompts, and to reflect on their understanding of the infographic, Sustainable Development Goal 6, and the concept of “Day Zero.”

### 3. Show a short video and lead a class discussion for students to build on their understanding of the need for clean water.

- Show the *Why Care About Water* video:
  - Before starting the video, ask these two questions to guide student viewing: *If we have so much water in the oceans, why is freshwater so scarce? How are we using water?*
- Encourage students to share reactions to the video and discuss the questions first with a partner and then as a class.
- Direct students to respond to the fourth prompt in their Project Journal and reflect on the video.

### 4. Introduce students to the National Geographic and Rolex Perpetual Planet Extreme Expedition to Mount Everest and how it connects to the unit project.

- Ask students to discuss with a partner: *Where do you think the world’s freshwater comes from?*
- Tell students that in April 2019, a team of scientists embarked on an expedition to the world's highest peak, Mount Everest, to study the stores and flows of water high in the Himalaya. Show the *Inside the Perpetual Planet Expedition to Mount Everest* video.
- Introduce students to the *Peak Water: Mount Everest and Global Water Supply* unit’s driving question (Why does Mount Everest’s ice matter?) and project.
  - For the final project, students propose a public education outreach campaign to creatively inform their community about human impacts on water security and inspire citizens to take action.
  - The final project will be guided by an evidence-based scientific argument that explains how increases in the human population and consumption of resources have impacted the glaciers and snowpack of Everest, as well as the water supply in other parts of the world.

- Outreach teams will identify a key message and objective for their campaign and draft a design for one visual component of their campaign, such as a mural, public art installation, billboard, video storyboard, or other creatively informative project appropriate to their community.
  - In a detailed and annotated sketch of their proposed public education campaign, teams portray how they will communicate one key message that relates to the significance of Everest and the Himalaya or a local water supply issue. In a culminating exhibition, teams pitch their campaign plan by presenting their design sketch and explaining how data and supporting evidence guided their public message and design choices.
  - Students should be challenged to represent a cause and effect relationship between human activities and water supply in their campaign to convey a message about water conservation.
  - Explain that throughout the unit, students will receive a Project Journal after each activity to reflect on what they've learned. Students' journal responses can then serve as the inspiration or basis for their final product.
  - Distribute and review the [Human Impact on Water Security Campaign: Project Rubric](#) to ensure students are clear on how their final projects will be assessed.
- Create a class *Know and Need to Know* chart based on students' understanding and questions about the *Peak Water: Mount Everest and Global Water Supply* unit.
    - Use the process below to elicit and record students' ideas and questions, which will be revisited throughout the unit.
    - Ask students to discuss the following questions with a partner and then share their responses with the class:
      - *What do we already know about Mount Everest and clean water?*
      - *What do we need to know about Mount Everest and clean water in order to design our campaign and scientific argument that explains how humans impact the water supply?*

## Tip

**Step 2:** To learn more about the Sustainable Development Goals, visit this [United Nations site](#).

## Tip

**Step 4:** To learn more about facilitating a *Know & Need to Know* chart in project-based learning, this [PBL Works blog](#) provides explanations and examples. Keep this chart handy, as it will be referred to throughout the unit.

## Modification

Students can also sketch in a notebook for the entire unit rather than in the Project Journal handouts for each activity.

## Informal Assessment

Students' responses to class discussions provide input on their understanding of water security. Additionally, student responses to the infographic and their thoughts about going without clean tap water for a day will be recorded in their *Project Journal: A Day Without Water*. You may decide to collect these journals at the end of each activity to provide feedback or check for completion, and then redistribute them to the students for use in their final project.

## Extending the Learning

If time allows, watch and discuss the [Countdown to Day Zero: Cape Town's Water Crisis](#) video to continue to make connections to how water conservation is an urgent global issue.

Provide students with the [Sustainable Development Goals](#) article to further student understanding of the goals and progress towards them.

## OBJECTIVES

## Subjects & Disciplines

### Biology

- Conservation

### Earth Science

- Climatology

### Geography

- [Physical Geography](#)

## Learning Objectives

Students will:

- Understand that water is a natural resource on which humans rely.
- Explain the reasons for the urgency of water conservation.
- Orient to the National Geographic Extreme Expedition to Mount Everest and the project for the Peak Water: Mount Everest and Global Water Supply unit.

## Teaching Approach

- Project-based learning

## Teaching Methods

- Discussions
- Reading
- Reflection

## Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
  - Learning and Innovation Skills
    - Communication and Collaboration
- 21st Century Themes
  - Environmental Literacy
  - Global Awareness
- Critical Thinking Skills
  - Analyzing
- Science and Engineering Practices
  - Analyzing and interpreting data
  - Asking questions (for science) and defining problems (for engineering)
  - Obtaining, evaluating, and communicating information

## National Standards, Principles, and Practices

# NEXT GENERATION SCIENCE STANDARDS

- Crosscutting Concept 2:

Cause and Effect

- MS-ESS3-4:

Construct an argument supported by evidence for how increases in human and natural resources impact Earth's systems.

- Science and Engineering Practice 1:

Asking questions and defining problems

- Science and Engineering Practice 2:

Developing and using models

- Science and Engineering Practice 8:

Obtaining, evaluating, and communicating information

## Preparation

## What You'll Need

## MATERIALS YOU PROVIDE

- Chart paper
- Markers

## REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per pair, Monitor/screen, Projector, Speakers

## PHYSICAL SPACE

- Classroom

## GROUPING

- Heterogeneous grouping
- Large-group instruction
- Large-group learning
- Small-group learning

# BACKGROUND & VOCABULARY

## Background Information

Millions of people worldwide are without clean water. As more cities, countries, and regions are faced with water shortages, it's critical for water security that we protect our freshwater sources like glaciers, snowpack, groundwater, lakes, and rivers. Cape Town, South Africa, and some regions of India are already experiencing this water scarcity as they approach what some call "Day Zero," the day the water runs out. Mount Everest (and other mountains) contain precious freshwater in their glaciers and snowpack. Some scientists refer to these mountains as "water towers" because they provide freshwater for people in an area, just like human-made water towers store water for people in cities and towns.

## Prior Knowledge

## Recommended Prior Activities

- None

## Vocabulary

Term	Part of Speech	Definition
freshwater	noun	water that is not salty.
Mount Everest	noun	highest spot on Earth, approximately 8,850 meters (29,035 feet). Mount Everest is part of the Himalaya and straddles the border of Nepal and China.
sanitation	noun	promotion of hygiene, health, and cleanliness.
water tower	noun	elevated structure used for storing water.

