

RESOURCE LIBRARY | ACTIVITY : 1 HR 15 MINS

## Avoiding “Day Zero”

Students research and compile a list of ways they can conserve water to avoid a “Day Zero” in their local watershed, as well as how Mount Everest mountaineers can avoid contributing to water issues for those living in the mountain's watershed. Students review information and images from the Perpetual Planet Expedition to Mount Everest for new ideas and inspiration.

### GRADES

6, 7, 8

### SUBJECTS

*Biology, Ecology, Earth Science, Climatology, Geography, Physical Geography*

### CONTENTS

9 Links, 1 PDF

## OVERVIEW

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For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/avoiding-day-zero/>

## In collaboration with



## DIRECTIONS

This activity is a part of the [Peak Water: Mount Everest and Global Water Supply](#) unit.

## 1. Assist students as they research and compile a list of ways they can conserve water to avoid a “Day Zero.”

- Introduce students to the term conservation. Let students know that in addition to industries and lawmakers making big changes that will impact our climate, they can take individual action to protect our water resources.
- Have students test their knowledge of ways to conserve water by working with a partner to play the Test Your WaterSense game.
  - Elicit students’ ideas about what they learned about water conservation and what new ideas they have for saving water at school and at home (as well as what farmers, governments, businesses, and nonprofit organizations can do).
- Distribute the Project Journal: Avoiding “Day Zero.” In teams of 2-4, have students research ways to conserve water using the following resources:
  - EPA: WaterSense for Kids
  - TED: 3 Thoughtful Ways to Conserve Water
  - American Rivers: 10 Ways to Save Water at Home
  - Students may choose to research other ideas beyond these resources. They should keep track of their ideas in Section 1 of their Project Journal.

## 2. Facilitate students’ exploration of Mount Everest Base Camp images to better understand how humans impact the Everest watershed.

- Have students browse the slideshow and read the captions in the Here’s what it’s like to live at Everest Base Camp article.
- Share these portions of the article with students:
  - “According to popular Everest blogger Alan Arnette, Nepal’s Ministry of Tourism has issued 375 Everest climbing permits for the 2019 spring season; on the North side, there are reportedly 144 foreign climbers. It’s illegal to simply show up at base camp with a climbing permit, pitch a tent, and try to climb the mountain. All foreigners must climb the mountain through a locally licensed logistics company, which supply base camp accommodations, meals, and basic bathroom facilities. For every one foreign

climber, there are three to four local workers living in base camp as well—either climbing Sherpa working on the mountain itself or base camp staff—the cooks, dishwashers, servers, and team managers who all look after the guided clients.”

- Share with students that about 500 hikers a day use the Everest Base Camp trail during the busy season.
- Ask: *What impact do you think the thousands of Everest Base Camp trekkers, over 500 foreign climbers, and 1,500 or so local workers—have on Mount Everest?* (Student responses may vary, but could include impacts due to water usage for meals and waste or wastewater produced by toileting.)
- Have students add to Section 2 of the Project Journal.

**3. Have students read with a partner the “Bad News for the Himalayas” section of the [Inside the Everest expedition that built the world’s highest weather station](#) article.**

- Debrief by asking students:
  - *Based on the article, how will the new weather stations on Mount Everest help scientists understand water security for the Ganges (Ganga)-Brahmaputra River watershed?* (Students may answer: Climate scientists can better understand the subtropical jet stream and collect long-term data on this influence on growing seasons and storm tracks. The weather stations will help scientists understand how snow accumulation and ice/snowmelt respond to climate variability and change.)
  - *Other than physical waste, what is the largest threat to Mount Everest’s watershed’s water security?* (Human waste or reduced water held in glacier/snowpack due to climate change)
- Let students know that in the next section, they will be researching and brainstorming ways to solve water security problems for the Ganges-Brahmaputra River watershed.

**4. Support students as they research ways Everest mountaineers can help minimize human impact on the quality of water supply for those living in this region.**

- Students can use any of these resources as they research different ways Everest mountaineers can help minimize human impact on the quality of water supply for those living in this region:

- [EOCA: Cleaning Up Mount Everest](#)
  - [UIAA: Everest summiteers required to help clean Mount Everest by bringing out garbage](#)
  - [ABC News: Mount Everest tackles 60,000-pound trash problem with campaign to clean up waste](#)
  - [Evening Standard: Human waste left by record number of Everest climbers 'threatens local drinking water'](#)
  - [Mount Everest Biogas Project: Healing the Human Impact on Everest](#)
- Ask students to share: *What ideas do you have from reading these articles about how to clean up Everest to protect the water?*
  - Let students know that their ideas can be used for inspiration in their campaign plan for their final product.
  - Direct students to complete Sections 3 and 4 of the Project Journal. They may decide to revisit the images from the [How We Impact the Water Supply](#) activity for inspiration as they sketch images.

#### 5. Prompt students to revise the *Know & Need to Know* chart for the last time.

- Revisit the class *Know & Need to Know* chart, initially completed in the [A Day Without Water](#) activity, for students to see how their thinking and understanding about water has changed throughout the unit.
- Ask students to discuss with a partner:
  1. *What do we already know about the importance of Everest's ice?*
  2. *Is there anything else you need to know?*
  3. *What questions can move from the Need to Know to the Know column?*
- Prompt students to share ideas and questions in a whole-class discussion. Record new ideas and revise their questions as needed in the *Know & Need to Know* chart.

## Tip

**Step 1:** If you want students to complete a paper version of the [Test Your WaterSense](#) game, you can print out the quiz. Otherwise, be sure to have the newest version of Flash installed on students' devices before the activity.

## Informal Assessment

Students will compile a list of ways they can conserve water to avoid a “Day Zero” and ways Everest mountaineers and Base Camp trekkers can help minimize human impact on the quality of water supply for those living in this region. They will record this list in the *Project Journal: Avoiding Day Zero*. The journal should be collected and reviewed at the end of this activity.

## Extending the Learning

Step 1: Have students read the [Conserving the Earth](#) article.

After the activity: Encourage students to share the [EPA WaterSense Pledge](#) with their families.

## OBJECTIVES

## Subjects & Disciplines

### Biology

- [Ecology](#)

### Earth Science

- Climatology

### Geography

- [Physical Geography](#)

## Learning Objectives

Students will:

- Explore and evaluate solutions for conserving water.
- Review the human impact on Mount Everest’s watershed using a hyper-local lens.

## Teaching Approach

- Project-based learning

## Teaching Methods

- Brainstorming
- Multimedia instruction
- Research

# Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
  - Information, Media, and Technology Skills
    - Information Literacy
  - Learning and Innovation Skills
    - Communication and Collaboration
    - Creativity and Innovation
    - Critical Thinking and Problem Solving
  - Life and Career Skills
    - Leadership and Responsibility
- 21st Century Themes
  - Environmental Literacy
  - Global Awareness
- Critical Thinking Skills
  - Analyzing
- Science and Engineering Practices
  - Constructing explanations (for science) and designing solutions (for engineering)
  - Obtaining, evaluating, and communicating information

## National Standards, Principles, and Practices

### COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS & LITERACY

- **CCSS.ELA-LITERACY.WHST.6-8.9:**

Draw evidence from informational texts to support analysis, reflection, and research.&nbsp;

### NEXT GENERATION SCIENCE STANDARDS

- **Crosscutting Concept 2:**

Cause and Effect&nbsp;

- **MS. Earth and Human Activity:**

MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

• **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 8:**

Obtaining, evaluating, and communicating information

## **Preparation**

## **What You'll Need**

### **REQUIRED TECHNOLOGY**

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

### **GROUPING**

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

### **RESOURCES PROVIDED: WEBSITES**

- Mount Everest Biogas Project

### **RESOURCES PROVIDED: UNDEFINED**

- TED Talk: Lana Mazareh: 3 Thoughtful Ways to Conserve Water

### **RESOURCES PROVIDED: HANDOUTS & WORKSHEETS**

- Project Journal: Avoiding "Day Zero"

### **RESOURCES PROVIDED: INTERACTIVES**

- EPA: Test Your WaterSense

## RESOURCES PROVIDED: IMAGES

- National Geographic: Here's What It's Like to Live at Everest Base Camp

## RESOURCES PROVIDED: ARTICLES & PROFILES

- American Rivers: 10 Ways to Save Water at Home
- Evening Standard: Human waste left by record number of Everest climbers 'threatens local drinking water'
- Cleaning Up Mount Everest
- UIAA: Everest summiteers required to help clean Mount Everest by bringing out garbage
- ABC News: Mount Everest tackles 60,000-pound trash problem with campaign to clean up waste
- EPA: WaterSense for Kids
- National Geographic: Inside the Everest expedition that built the world's highest weather station

## BACKGROUND & VOCABULARY

### Background Information

The connection between the weather station on Mount Everest and water security can be difficult to understand. The key to the connection can be found in the [Inside the Everest expedition that built the world's highest weather station](#) article:

"The reason any of this was worth the effort, risk, and cost is because only Mount Everest and a few of its Himalayan cousins are tall enough to reliably pierce the subtropical jet stream—one of the narrow bands of powerful winds that circle the globe at high altitudes, influencing everything from storm tracks to agriculture growing seasons. For climate scientists, there are few more pressing phenomena to understand than the jet stream, and the weather station would provide scientists an important new tool with which to gather data about it."

Because jet streams affect temperature and precipitation, they impact the water available in a watershed. To read more about jet streams, you can visit this [Jet stream](#) encyclopedic entry or this [Jet Streams](#) article from the North Carolina Climate Office.



# Prior Knowledge

["Students should have a basic understanding of their project work for the unit and how Mount Everest connects to water conservation issues."]

## Recommended Prior Activities

- [A Day Without Water](#)
- [Endless Dry Spells](#)
- [How We Impact the Water Supply](#)
- [How We Use Water](#)
- [Precious Freshwater](#)
- [Watersheds](#)
- [Water Towers and Shrinking Glaciers](#)

## Vocabulary

Term	Part of Speech	Definition
conservation	<i>noun</i>	management of a natural resource to prevent exploitation, destruction, or neglect.
Sherpa	<i>noun</i>	people and culture native to the Himalayan region of Nepal and China. Sherpa often serve as mountaineer guides and porters on mountain-climbing expeditions.
water conservation	<i>noun</i>	process of lowering the amount of water used by homes and businesses.

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### For Further Exploration

#### Websites

- [National Geographic: Life at the Extremes](#)

