

RESOURCE LIBRARY | ACTIVITY : 1 HR 15 MINS

Endless Dry Spells

Students share their prior knowledge of droughts and build on their understanding by watching two short videos. They read about Cape Town's "Day Zero" to understand how drought is impacting water security in a particular city. Students read an article about the effects of climate change on water access to deepen their understanding of how climate change impacts water security.

GRADES

6, 7, 8

SUBJECTS

Biology, Ecology, Conservation, Earth Science, Climatology

CONTENTS

4 Resources, 1 Video, 1 PDF

OVERVIEW

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For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/endless-dry-spells/>

In collaboration with

DIRECTIONS

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

1. Elicit students' prior knowledge about droughts and build on their understanding.

- Ask students to think about what they know about droughts and share their ideas with a partner, then have a few volunteers share out with the class. Tell students that in this activity they will be investigating droughts, one threat to water security for people around the world.
- Watch and discuss the [Climate Change and California's Drought](#) video. Lead a debrief discussion by asking:
 - *What did you notice about the reservoir?* (Students' responses may include: Folsom Lake's water levels were low. The floating docks were sitting on dry land.)
 - *What do you think caused the water to be so low?* (Students' responses may include: Climate change; the drought has gone on for four years; there is low snowpack.)
- Watch the [Droughts 101](#) video. Lead a debrief discussion by asking:
 1. *What causes droughts?* (Students' responses may include: Natural and human factors; changing wind patterns causing high pressure weather systems to last for too long; overuse of water supplies)
 2. *Why do you think droughts are becoming more severe in some places?* (Students' responses may include: increasing human populations are using increasing amounts of water, climate change is shifting weather patterns.)
 3. *Based on what you have learned so far or on your own ideas, how could a drought be prevented for communities surrounding Mount Everest?* (Students' responses may include: regulating water use, protecting water sources, monitoring glacier size and snowpack, reducing greenhouse gas emissions.)
- Distribute the [Project Journal: Endless Dry Spells](#) and direct students to record their ideas in Section 1.

2. Invite students to read about Cape Town's "Day Zero" to understand how drought is impacting water security in a particular city.

- Have students read the article [Why Cape Town is Running Out of Water and Who's Next.](#)

- Have students journal their responses to the article and the following questions in Section 2 of their Project Journal for this activity:

1. *What do you think is causing Cape Town to run out of water?* (Students' responses may include: population growth and a record drought, possibly changes in climate.)
2. *How do you think the residents feel?* (Students' responses will vary and may include: powerless, angry, scared, frustrated.)
3. *How do you think the residents of the Ganges (Ganga)-Brahmaputra River watershed (that you read about in the Living in Mount Everest's Watershed article during the Watersheds activity of this unit) would feel if they ran out of water? Try to consider a specific person when you journal your responses.* (Student's responses will vary.)

3. Prompt students to read an article to deepen their understanding of how climate change impacts water security.

- Have students read the [How Climate Change Impacts Water Access](#) article in pairs and discuss the main ideas. Students will complete Section 3 in the Project Journal.
- Guide students in creating a cause and effect pathway connecting climate change and water access in Section 4 of their Project Journal.

4. Revisit the *Know & Need to Know* chart.

- Revisit the class *Know & Need to Know* chart, started in the [A Day Without Water](#) activity and revisited throughout the unit, for students to see how their thinking and understanding about water has continued to change.
- Ask students to discuss with a partner:
 - *What do we already know about the importance of Mount Everest's ice?*
 - *What do we need to know?*
 - *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: Discuss the nuances of drought with students and the difference between meteorological drought and drought from overuse of water resources. Discuss the impact that climate change may have on short-term and long-term water accessibility. As the climate warms, we expect more (not less) rainfall. Retreating glaciers on their own will not necessarily lead to less water availability. Their retreat will make some people more exposed to drought, though, but only for some mountain catchments in Asia (not necessarily in the Himalaya).

Informal Assessment

Students will contribute to small group and class discussions with their ideas. They will also journal their responses to the reading and video in their [Project Journal: Endless Dry Spells](#) and submit them for feedback.

Extending the Learning

Step 1: Read about the lack of snow in the Sierra Nevada Mountains in the article [500-Year Snow Fail in California's Iconic Mountains](#) to connect to previous lessons about snowpack and connect to the drought in this activity.

Watch this three-minute [Extreme Weather: Droughts](#) video about how droughts link to forest fires in California.

Read the full [Drought](#) encyclopedic entry.

OBJECTIVES

Subjects & Disciplines

Biology

- [Ecology](#)
- Conservation

Earth Science

- Climatology

Learning Objectives

Students will:

- Explain what a drought is and what kinds of factors cause droughts.

- Develop a cause and effect pathway between climate change and water security for people around the world.

Teaching Approach

- Project-based learning

Teaching Methods

- Discussions
- Information organization
- Reading

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
 - Understanding
- 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.

NEXT GENERATION SCIENCE STANDARDS

- **Crosscutting Concept 2:**

Cause and Effect

- **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, Monitor/screen, Projector, Speakers

PHYSICAL SPACE

- Classroom

GROUPING

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

BACKGROUND & VOCABULARY

Background Information

Droughts are a complex phenomenon to understand. Fortunately, the goal of this activity is not to fully explain droughts themselves, but to provide students with a baseline understanding of what causes them (the demand outweighs the supply and changing weather systems). There are different "types" of drought. A meteorological drought, for example, is not at all impacted by humans' use of water. Climate change is worsening the duration and severity of droughts occurring today. Water security, according to the United Nations, is "The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability." Water security will continue to be an issue as the human population rises and the threat of drought continues.

Prior Knowledge

["Students should know what freshwater is, how people use water, and where most fresh water comes from. They should have a sense of how the National Geographic and Rolex's Perpetual Planet Extreme Expedition to Mount Everest connects to water security."]

Recommended Prior Activities

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

Vocabulary

Term	Part of Speech	Definition
climate	<i>noun</i>	all weather conditions for a given location over a period of time.
climate change	<i>noun</i>	gradual changes in all the interconnected weather elements on our planet.
drought	<i>noun</i>	period of greatly reduced precipitation.

Term	Part of Speech	Definition
Himalaya Mountains	<i>noun</i>	mountain range between India and Nepal.
reservoir	<i>noun</i>	natural or man-made lake.
weather system	<i>noun</i>	movement of warm or cold air.



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