NATIONAL GEOGRAPHIC

RESOURCE LIBRARY
UNIT

Peak Water: Mount Everest and Global Water Supply

In this unit, students develop an understanding of water security and explore the impact of human activity on water resources, locally as well as globally. Guided by the National Geographic and Rolex Perpetual Planet Expedition to Mount Everest, students learn about sources of freshwater, the importance of watersheds, and those who rely on them, and interact with and interpret real-time data. Finally, students draw on what they have learned to design and propose a public education outreach campaign to inform their community about human impacts on water security and inspire citizens to take action.

GRADES

6 - 8

SUBJECTS

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

CONTENTS

3 Lesson plans

For the complete unit with media resources, visit:
http://www.nationalgeographic.org/unit/peak-water-mount-everest-global-water-supply/

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UNIT OVERVIEW

The Himalaya—the mountain range that includes the world's highest peak, Mount Everest—act as a “water tower” providing water to more than 1.5 billion people. To better understand this critical water source, National Geographic explorers embarked on an expedition to collect field data. In this unit, students explore the impact of human activity on local and global

water resources while exploring video, maps, and photographs from the National Geographic and Rolex Perpetual Planet Expedition to Mount Everest. They interact with real-time weather data transmitted from the two highest operating weather stations in the world.

Students analyze the water use and geospatial data for specific regions of the United States and Mount Everest. After exploring issues related to the supply and demand of water, students construct an evidence-based argument explaining how increases in human population and consumption of resources have impacted Mount Everest's glaciers and snowpack, as well as the water supply in other parts of the world. As a final project, students design and propose a public education outreach campaign to creatively inform their community about human impacts on water security and inspire citizens to take action.

Use this unit at a glance to explore a brief outline of the materials included in this resource.

Unit Driving Question: Why does Mount Everest's ice matter?

LESSON 1: WATER WORKS | 5 HRS

Students compare their own tap water use in light of global freshwater access to develop an understanding of water security. They learn how watersheds work, locate their local watershed, then turn their attention to the importance of Mount Everest's watershed and the people who rely on it. They use a variety of resources to learn about key sources of freshwater. Finally, students collect evidence connecting Mount Everest's ice to water security by exploring maps, analyzing graphs and infographics, reading articles, and more. This lesson is part of the *Peak Water: Mount Everest and Global Water Supply* unit.

LESSON 2: A SHIFT IN SUPPLY AND DEMAND | 4 HRS 35 MINS

Guided by the National Geographic and Rolex's Perpetual Planet Extreme Expedition to Mount Everest in 2019, students explore the relationship among reduced snowpack, human population, and water security, and how Everest climbers impact watersheds. They explore real-time weather data from the highest operating weather stations in the world, analyze infographics, and engage with interactive maps and graphs. Students write a scientific argument linking the human population to freshwater supply and learn how scientific ideas can be creatively conveyed to the public in preparation for creating their final project. This lesson is part of the *Peak Water: Mount Everest and Global Water Supply* unit.

LESSON 3: A RIPPLE EFFECT | 5 HRS

Students learn about droughts and the link between climate change and water access through videos, readings, and discussions. They then brainstorm how to avoid a "Day Zero" in their watershed and how Mount Everest mountaineers can help protect the mountain's watershed. Students draw from their Project Journals to create and present a public education outreach campaign and supporting scientific argument illustrating how humans impact water security. This lesson is part of the *Peak Water: Mount Everest and Global Water Supply* unit.

BACKGROUND & VOCABULARY

Vocabulary

Term	Part of Speech	Definition
agriculture	*noun*	the art and science of cultivating land for growing crops (farming) or raising livestock (ranching).
aquifer	*noun*	an underground layer of rock or earth which holds groundwater.
argument	*noun*	reason or set of reasons given with the aim of persuading others that an action or idea is right or wrong.
barometric pressure	*noun*	atmospheric pressure as read by a barometer.
claim	*verb*	to state as the truth.
climate	*noun*	all weather conditions for a given location over a period of time.
climate change	*noun*	gradual changes in all the interconnected weather elements on our planet.

Term	Part of Speech	Definition
conservation	*noun*	management of a natural resource to prevent exploitation, destruction, or neglect.
domestic	*adjective*	having to do with the day to day activities and upkeep of a personal residence such as a house, apartment, farm, or other estate.
drainage basin	*noun*	an entire river system or an area drained by a river and its tributaries. Also called a watershed.
drought	*noun*	period of greatly reduced precipitation.
evidence	*noun*	data that can be measured, observed, examined, and analyzed to support a conclusion.
freshwater	*noun*	water that is not salty.
Ganges River	*noun*	(2,495 kilometers/1,550 miles) river in South Asia that originates in the Himalaya and empties into the Bay of Bengal. Also called the Ganga.
Gangotri Glacier	*noun*	large glacier in the Himalaya Mountains, the source of the Ganges (Ganga) River.
glacier	*noun*	mass of ice that moves slowly over land.
groundwater	*noun*	water found in an aquifer.
headwater	*noun*	source of a river.
Himalaya Mountains	*noun*	mountain range between India and Nepal.
hydrological	*adjective*	having to do with the study of water.
industry	*noun*	activity that produces goods and services.
inequality	*noun*	difference in size, amount, or quality between two or more things.
irrigation	*noun*	watering land, usually for agriculture, by artificial means.
lake	*noun*	body of water surrounded by land.
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.
population density	*noun*	the number of people living in a set area, such as a square mile.
reasoning	*noun*	process of using evidence to make inferences or conclusions using logic.
relative humidity	*noun*	ratio between the amount of water vapor in the air and the air's saturation point. Relative humidity is expressed as a percentage.
reservoir	*noun*	natural or man-made lake.
river	*noun*	large stream of flowing fresh water.

Term	Part of Speech	Definition
river basin	*noun*	land drained by a river and its tributaries
sanitation	*noun*	promotion of hygiene, health, and cleanliness.
Sherpa	*noun*	people and culture native to the Himalayan region of Nepal and China. Sherpa often serve as mountaineer guides and porters on mountain-climbing expeditions.
snowpack	*noun*	layers of snow that naturally build up during snowfalls.
temperature	*noun*	degree of hotness or coldness measured by a thermometer with a numerical scale.
thermoelectric power plant	*adjective*	power plant that uses a temperature difference between two materials to generate electricity.
tributary	*noun*	stream that feeds, or flows, into a larger stream.
upcycle	*verb*	to recycle one or more items to create an object that is worth more than the original product.
water conservation	*noun*	process of lowering the amount of water used by homes and businesses.
water scarcity	*noun*	situation when the amount of water available does not meet the amount of water needed or wanted by a population.
water stress	*noun*	situation faced by a nation or community when the amount of available water is less than 1,700 cubic meters per person.
water tower	*noun*	elevated structure used for storing water.
water vulnerability	*noun*	threats to the supply of freshwater such as aquifer depletion, contamination from human and natural sources, and the effects of climate variability and change.
watershed	*noun*	entire river system or an area drained by a river and its tributaries.
weather system	*noun*	movement of warm or cold air.
wind	*noun*	movement of air (from a high pressure zone to a low pressure zone) caused by the uneven heating of the Earth by the sun.