

RESOURCE LIBRARY | ACTIVITY : 2 HRS

# Modeling Human Impact on Water Security

Students draw from the Project Journals they completed throughout the *Peak Water: Mount Everest and Global Water Supply* unit and their previously constructed scientific argument to create and present an artistic response to the impacts that humans can have on water security. Students create an artistic model that focuses on the significance of Mount Everest and the Himalaya, or represents a local water supply issue of their choice. They produce either a collage, a drawing, a painting, digital art, or three-dimensional creation of their choice. Students represent a cause-and-effect relationship in their art or send a message about water conservation. Artistic models and accompanying scientific argumentation are then evaluated by student peers.

## GRADES

6, 7, 8

## SUBJECTS

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

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## OVERVIEW

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For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/modeling-human-impact-water-security/>

# In collaboration with



## DIRECTIONS

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

**1. Assist students as they refer to the Project Journals they completed throughout the Peak Water: Mount Everest and Global Water Supply unit and the scientific argument they previously drafted in the How We Impact the Water Supply activity to create their artistic responses about the ripple effect that human activity can have on water security.**

- Remind students of the parameters for their artistic model:
  - Students can focus on the significance of Mount Everest and the Himalaya or represent a local water supply issue of their choice.
  - Students can produce a collage, a drawing, a painting, digital art, or three-dimensional creation of their choice.
  - Students should be challenged to represent a cause-and-effect relationship in their art or send a message about water conservation.
- Revisit the Modeling Human Impact on Water Security Project Rubric to ensure students are clear on how their final products will be assessed.
- Allow students at least 60 minutes in class to work on their artistic models using the available materials (including those they are upcycling). Some students may need an additional class period to produce their artistic models.

**2. Facilitate as students share their art and scientific arguments.**

- Decide in advance if you will have students share their projects one at a time or if you will have a Gallery Walk style presentation.

- Have students brainstorm two to three focus questions to elicit feedback from their classmates/audience and record these in a visible place.
- Distribute the *Modeling Human Impact on Water Security Project Rubric* and the focus questions that students brainstormed; students and other audience members will use them to evaluate the artistic models and the students' accompanying scientific argumentation.

### 3. Prompt students to engage in a reflection on the project.

- Lead students in a discussion in which they reflect on the project. Physically move students' chairs in a circle. Use the following prompts as guides for the discussion:
  1. *What are some key ideas that you'll probably always remember from the project?*
  2. *What part was the most challenging?*
  3. *What part did you enjoy most?*
  4. *If you could do something different, what would it be?*
  5. *If you could change one thing about this project, what would it be?*
  6. *What is one thing you'll do differently related to water to ensure water security?*

### 4. Assess students' understanding of the *A Ripple Effect* lesson of the *Peak Water: Mount Everest and Global Water Supply* unit through an exit ticket.

- Use the prompt below to assess students' understanding of the main concepts covered in the *A Ripple Effect* lesson. Have students respond individually to this prompt on an exit ticket:
  - *Using evidence from this lesson's activities, explain:*
    1. *How droughts occur*
    2. *How climate change and human activities can make droughts worse and make them last longer.*

## Tip

**Step 1:** Provide additional examples of artistic projects that are grounded in science:

- [Artists Inspired by Science](#)
- [Art and Climate Change](#)
- [Washed Ashore](#)

# Modification

You may decide to have students use the [Modeling Human Impact on Water Security Project Rubric](#) to do a peer review of the artistic models and arguments before the presentations.

## Rubric

Use the [Modeling Human Impact on Water Security Project Rubric](#) to assess students' understanding of the key concepts of the unit via their artistic models and scientific arguments. Additionally, the audience feedback, student responses to the final reflection questions, and/or the peer evaluations can all be used to inform your final assessment of each student's individual understanding and contribution to the project. Use the exit ticket in Step 4 to assess students' understanding of the [A Ripple Effect](#) lesson.

## Extending the Learning

Share students' work in a public location, such as a library, watershed center, science museum, or other visible location.

## OBJECTIVES

## Subjects & Disciplines

### **Biology**

- [Ecology](#)
- Conservation

### **Earth Science**

- Climatology

### **Geography**

- [Physical Geography](#)

## Learning Objectives

Students will:

- Produce a collage, a drawing, a painting, digital art, or three-dimensional creation of their choice.
- Share their artistic model and scientific argument with an audience.

- Provide feedback on other students' projects.
- Reflect on the project.

## Teaching Approach

- Project-based learning

## Teaching Methods

- Hands-on learning
- Self-directed learning

## Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
  - Learning and Innovation Skills
    - Communication and Collaboration
    - Creativity and Innovation
- 21st Century Themes
  - Environmental Literacy
  - Global Awareness
- Critical Thinking Skills
  - Applying
  - Creating
  - Evaluating
- Science and Engineering Practices
  - Developing and using models
  - Engaging in argument from evidence
  - Obtaining, evaluating, and communicating information

## National Standards, Principles, and Practices

# COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS & LITERACY

- **CCSS.ELA-LITERACY.SL.3:**

Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence. SL.6.3 / SL.7.3 / SL.8.3

- **CCSS.ELA-LITERACY.SL.7.4:**

Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.&nbsp;

- **CCSS.ELA-LITERACY.SL.7.5:**

Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points

- **CCSS.ELA-LITERACY.SL.7.6:**

Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 7 Language standards 1 and 3 here for specific expectations.)&nbsp;

## NEXT GENERATION SCIENCE STANDARDS

- **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

### MATERIALS YOU PROVIDE

- Art materials or upcycled materials for students to create their 2D or 3D artistic model. (You may decide to ask students to bring in materials to supplement the materials you provide.)

## REQUIRED TECHNOLOGY

- Internet Access: Optional
- Tech Setup: 1 computer per pair

## PHYSICAL SPACE

- Classroom

## GROUPING

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

## RESOURCES PROVIDED: HANDOUTS & WORKSHEETS

- [Modeling Human Impact on Water Security Project Rubric](#)

## BACKGROUND & VOCABULARY

### Background Information

The production of a scientific argument and engaging in feedback or review of one's work are authentic to the work of scientists. Students are taking the roles of artist, presenter, and audience member in this activity, which are all authentic roles that can be found in the world outside the classroom. These roles are relevant to the student because they will be invested in the artistic work they create. Students will find presenting their art and argument relevant if the audience is authentic, and they will find the role of audience member to be relevant if they are able to provide meaningful feedback to their peers.

### Prior Knowledge

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### Recommended Prior Activities

- [A Day Without Water](#)
- [Avoiding “Day Zero”](#)
- [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
Mount Everest	<i>noun</i>	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.
upcycle	<i>verb</i>	to recycle one or more items to create an object that is worth more than the original product.



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