

RESOURCE LIBRARY | ACTIVITY : 1 HR 15 MINS

Causes and Effects of Extinction

Students explore drivers of extinction, human and environmental, found within specific ecosystems of Earth's major biomes by investigating habitat destruction caused by forces like climate change, parasites, greenhouse gases, and natural disasters. Teams seek solutions to mitigate habitat loss and prevent extinction, and incorporate key findings into their culminating conservation pamphlets.

GRADES

6, 7, 8

SUBJECTS

Biology, Ecology, Conservation, Earth Science, Geology, Oceanography, Geography, Human Geography, Physical Geography, Social Studies, Civics, Economics

CONTENTS

1 Video, 6 PDFs, 1 Link

OVERVIEW

Students explore drivers of extinction, human and environmental, found within specific ecosystems of Earth's major biomes by investigating habitat destruction caused by forces like climate change, parasites, greenhouse gases, and natural disasters. Teams seek solutions to mitigate habitat loss and prevent extinction, and incorporate key findings into their culminating conservation pamphlets.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/causes-and-effects-extinction/>

DIRECTIONS

Engaging in the Fight Against Extinction Unit Driving Question: *How can we, as planetary stewards, take an active role in saving species from extinction?*

The Sixth Mass Extinction? Lesson Driving Question: *How have humans impacted the Earth for better and for worse?*

1. Engage students in the analysis of a photograph.

- Display the photograph at the start of the [Hurricane Katrina Explained](#) article which shows the combined human and environmental impacts on the environment.
- Guide students in an analysis of the photograph by asking:
 - *What is the first thing you notice in this photograph?*
 - *What destructive elements of this environment have been caused by humans, and what destructive elements have been caused by nature?*
 - *Should elements like the homes be considered destruction? Why or why not?*
 - *How are these destructive elements impacting animals and people living in the area?*

2. Have students create a *Know and Need to Know* chart to address the lesson's driving question.

- Share with students the *Drivers of Extinction* lesson driving question: *Why is it important to prevent species extinction?*
 - Solicit responses from students.
 - Select and share key facts from this activity's Background Information section being sure to address both human and environmental drivers of extinction to support student understanding of both types of drivers of extinction.
- Initiate question generation by asking: *What else do we need to know in order to really understand why it is important to prevent species extinction?*
- In their research teams, have students generate a *Drivers of Extinction Know and Need to Know* chart to help them respond to this question. Have teams share with the class the question from the list that they are most curious to answer in this lesson.

3. Use a video on climate and the oceans to facilitate a discussion about the differences between environmental and human drivers of extinction.

- Provide a quick overview of the difference between environmental and human factors and ask students to pay close attention to examples of each while watching the video.
- As a class, watch the [*Climate 101: Oceans video*](#) (2:38). After watching the video, have student teams discuss the following questions:
 - *What did you notice in the video that was an environmental factor influencing the ocean's biome?* (Possible answer: volcanic eruptions)
 - *What did you notice in the video that was an example of a human factor influencing the ocean's biome?* (Possible answers: greenhouse gas emissions causing the greenhouse effect because of more carbon dioxide in the atmosphere.)
 - *Can environmental and human drivers overlap? Can a source be both a human and an environmental factor? If so, provide an example.* (Possible answer: climate change is influenced heavily by human factors like greenhouse gas emissions, which fuel stronger and more frequent storms.)
- Have teams share out their responses. Chart responses on a board or chart paper for student reference.
- Distribute a copy of the [*Investigating an Endangered Species and its Biome*](#) handout to each student. Use student responses to demonstrate how students should record their information in Step 1 and Step 2 of the handout.
- Distribute copies of the relevant version (see below) of *Biomes and Endangered Species Curated Resources* to appropriate groups to prepare students to begin their research.
 - [*Biomes and Endangered Species Curated Resources: Aquatic Biome*](#)
 - [*Biomes and Endangered Species Curated Resources: Desert Biome*](#)
 - [*Biomes and Endangered Species Curated Resources: Forest Biome*](#)
 - [*Biomes and Endangered Species Curated Resources: Grassland Biome*](#)
 - [*Biomes and Endangered Species Curated Resources: Tundra Biome*](#)
- In the next step, half of the research teams will be researching environmental drivers of extinction, and the other half will research human drivers of extinction specific to their biome and focal species.
- Suggest students begin with the first sources provided in the biome section and the species section of *Biomes and Endangered Species Curated Resources* and move onto additional resources if they need additional information or have extra time.

4. Engage students in researching the drivers of extinction facing their species and its biome.

- Split research teams into two focus groups: human drivers of extinction and environmental drivers of extinction.
 - Environmental drivers focus group: Using the appropriate resources, have students gather evidence of environmental drivers' impact on their species and its biome and record their response in Step 1 of *Investigating an Endangered Species and its Biome*.
 - Human drivers focus group: Using the appropriate resources, have students gather evidence of human impact on their species and its biome and record their response in Step 2 of *Investigating an Endangered Species and its Biome*. (While many environmental factors, such as increased storms and rising temperatures, are linked to human impact, students should still list these as environmental drivers.)
- In their research teams, have students choose a role for this portion of the activity. The roles are:
 - Facilitator: Responsible for keeping the group on task and productivity flowing within the allotted time.
 - Presenter and Fact Checker: Responsible for sharing the group's information with the class and settling any fact disputes through additional research.
 - Recorder: Responsible for writing the group's ideas on group documentation.
- Bring focus groups back together to share their findings with their full research group so all students have recorded evidence of both human and environmental drivers of extinction.
- Remind students that their project will be suggesting an action that individuals can take to prevent the extinction of their group's focal species. Have students look through their two lists to identify and highlight drivers of extinction that might be beneficial to include in their project pamphlets.

5. Guide students in debriefing the activity by adding to their *Know and Need to Know* chart based on their research.

- Have students return to their *Drivers of Extinction Know and Need to Know* charts started in Step 2 and add to it as necessary to represent their learning during the activity.
- As a class, discuss the most interesting and important things learned from their research today.

Modification

Step 4: For advanced or older students, require quotes or paraphrasing with source citations.

Modification

Step 4: For younger grades, reduce the number of websites on the curated list.

Modification

Step 4: The curated list of resources covers a range of Lexile levels and a variety of multimedia information (such as text, infographics, and videos). To better match students to their needs, assign students who may need reading support with resources that have less text.

Informal Assessment

Investigating an Endangered Species and its Biome: Students will complete the environmental and human influences portion of their handout in this activity.

OBJECTIVES

Subjects & Disciplines

Biology

- Ecology
- Conservation

Earth Science

- Geology
- Oceanography

Geography

- Human Geography
- Physical Geography

Social Studies

- Civics
- Economics

Learning Objectives

Students will:

- Distinguish between environmental and human drivers of extinction and identify drivers of extinction for their focal biome and species.
- Identify various drivers of extinction and explain the driver's effects on the focal biome and species.

Teaching Approach

- Project-based learning

Teaching Methods

- Reading
- Research
- Self-directed learning

Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
 - Information, Media, and Technology Skills
 - Information Literacy
 - Media Literacy
 - Learning and Innovation Skills
 - Communication and Collaboration
 - Critical Thinking and Problem Solving
 - Life and Career Skills
 - Initiative and Self-Direction
 - Leadership and Responsibility
 - Productivity and Accountability
- 21st Century Themes
 - Environmental Literacy
 - Global Awareness
- Critical Thinking Skills
 - Analyzing

- Applying
- Evaluating
- Understanding

National Standards, Principles, and Practices

COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS & LITERACY

- CCSS.ELA-LITERACY.RI.6.7:

Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

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

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

THE COLLEGE, CAREER & CIVIC LIFE (C3) FRAMEWORK FOR SOCIAL STUDIES STATE STANDARDS

- D2.His.14.6-8:

Explain multiple causes and effects of events and developments in the past.

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Chart paper

REQUIRED TECHNOLOGY

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

PHYSICAL SPACE

- Classroom

GROUPING

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

RESOURCES PROVIDED: UNDEFINED

- Climate 101: Oceans

RESOURCES PROVIDED: HANDOUTS & WORKSHEETS

- [Investigating an Endangered Species](#)
- [Biomes and Endangered Species Curated Resources: Aquatic Biome](#)
- [Biomes and Endangered Species Curated Resources: Desert Biome](#)
- [Biomes and Endangered Species Curated Resources: Forest Biome](#)
- [Biomes and Endangered Species Curated Resources: Grassland Biome](#)
- [Biomes and Endangered Species Curated Resources: Tundra Biome](#)

RESOURCES PROVIDED: ARTICLES & PROFILES

- National Geographic: Hurricane Katrina Explained

BACKGROUND & VOCABULARY

Background Information

Environmental drivers, such as natural disasters, impact biodiversity because of habitat disruption. Earthquakes, landslides, wildfires, floods, droughts, volcanic eruptions, tsunamis, and other environmental drivers change the face of the Earth's surface. While human drivers may play a part in an increase in natural disasters, changing the course of this chain reaction is difficult once it has begun.

Human beings have been changing the Earth at an ever-increasing rate since the Industrial Revolution. Advancements in agriculture have especially impacted biomes and habitats that many species call home. In fact, up to one million plant and animal species face extinction, many within decades, because of human activities. Without drastic action to conserve

habitats, the rate of species extinction will undoubtedly increase. While agricultural activities have had the largest impact on ecosystems due to the use of fertilizers and the conversion of areas such as tropical forests to grow crops or raise livestock, the next biggest threats to nature are the exploitation of plants and animals through harvesting, logging, hunting, and fishing; climate change; pollution; and the spread of invasive species.

Prior Knowledge

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Recommended Prior Activities

- None

Vocabulary

Term	Part of Speech	Definition
biodiversity	<i>noun</i>	all the different kinds of living organisms within a given area.
biome	<i>noun</i>	area of the planet which can be classified according to the plant and animal life in it.
chain reaction	<i>noun</i>	series of events where the previous event causes the next event.
climate	<i>noun</i>	all weather conditions for a given location over a period of time.
conservation	<i>noun</i>	management of a natural resource to prevent exploitation, destruction, or neglect.
driver	<i>noun</i>	any natural or human-induced factor that directly or indirectly sets a change to an <u>ecosystem</u> in motion.
endangered species	<i>noun</i>	organism threatened with extinction.
extinct	<i>adjective</i>	no longer existing.
natural disaster	<i>noun</i>	an event occurring naturally that has large-scale effects on the environment and people, such as a volcano, earthquake, or hurricane.

For Further Exploration

Images

- [Our World in Data: Natural Disasters](#)

Websites

- [National Geographic: Natural Disasters](#)
- [IUCN: Red List of Threatened Species](#)
- [Joel Sartore: Can I Interview You?](#)
- [National Geographic: Photo Ark](#)



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