

RESOURCE LIBRARY | ACTIVITY : 50 MINS

Mass Extinctions Over Time

Students are introduced to our planet's five mass extinctions and the possibility of a sixth mass extinction. Students collaborate to build deeper knowledge about the first five extinctions as they prepare to create an action plan to save endangered species from extinction.

GRADES

6, 7, 8

SUBJECTS

Social Studies, Civics, U.S. History

CONTENTS

2 Links, 2 PDFs, 2 Resources

OVERVIEW

Students are introduced to our planet's five mass extinctions and the possibility of a sixth mass extinction. Students collaborate to build deeper knowledge about the first five extinctions as they prepare to create an action plan to save endangered species from extinction.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/mass-extinctions-over-time/>

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 Earth for better and for worse?

1. Introduce students to mass extinctions through an inquiry discussion focused on the Permian Extinction.

- Begin by showing students the first 1:30 minutes of the video, *Ancient Earth: The Permian* (13:27).
- Using the think-pair-share method, have students partner up to determine what could have happened to cause the extinction of nine out of 10 plant and animal species alive during the Permian period. Record and display partner theories to the following questions:
 - *Why would multiple plant and animal species get wiped out together within the same ancient ecosystem?*
 - *What possible catastrophic natural disasters might have caused mass extinction (share examples, if necessary)?*
 - *How might the extinction of one species affect other species?*

2. Have students investigate multimedia resources to build their knowledge of the five mass extinctions.

- Distribute the *Five Mass Extinctions Four-Square* and divide the class into teams of three to research each of the five mass extinctions.
- Number groups from one to five to determine each group's focus, then have each student in the group use one of the following resources:
 - *Extinction* encyclopedic entry
 - *Mass Extinctions* infographic
 - American Museum of Natural History's *Shelf Life* multimedia webpage
- Have students fill in their *Five Mass Extinctions Four-Square* handout with information from their assigned source.
- After reading their resource, have students collaborate, sharing their combined knowledge to complete a large Four-Square on chart paper.
 - If multiple teams researched the same mass extinction, combine the teams for this portion of the step.
- Have each mass extinction team present their four-square and share their learning with the rest of the class.

3. Facilitate a whole-class discussion to guide students' analysis of past extinctions and predictions about future mass extinctions.

- Conduct a class discussion around the following questions:
 - *Looking across all of these extinctions, do they have anything in common?*
 - *Do you think any of the conditions that led to a mass extinction are present today?*
 - *Have you heard about any species that are in danger of extinction? What is causing that danger?*

4. Introduce the unit's driving question, the lesson's driving question, and the planetary stewardship project that will anchor all unit learning objectives together.

- As a class, return to the [Mass Extinctions](#) infographic and read about the sixth mass extinction.
- Lead a class discussion on the causes and preventative measures for mass extinction. Ask:
 - *What kinds of things do humans do that would contribute to mass extinction?*
 - *What kinds of things do humans do that might save the planet from a mass extinction?*
- Share with students the driving questions for the unit and lesson.
 - Unit Driving Question: *How can we, as planetary stewards, take an active role in saving species from extinction?*
 - Lesson Driving Question: *How have humans impacted Earth for better and for worse?*
- Define for students what it means to be a planetary steward.
 - Planetary stewardship is taking action to shape the trajectory of change on the planet to enhance the sustainability of both human well-being and the planet's ecosystems and nonliving resources.
 - Give students an opportunity to provide examples of how they are planetary stewards or how people might demonstrate planetary stewardship.
- Have students choose either the unit or lesson driving question and, with a partner, come up with an initial response to the question. Have students share their initial responses as a class and record student thinking to revisit later in the lesson.

Tip

Assessment: Note any potential needs for grouping changes or coaching in collaborative work that the group may need in order to be successful with the longer-term project. Use the time to emphasize the importance of the roles in effective group work. Ask follow-up questions to gain a sense of students' understanding of their group's mass extinction.

Tip

Begin a word wall with the vocabulary, beginning with the words from this activity.

Tip

Step 1: More information on the [Think-Pair-Share Strategy](#) is available here to support implementation.

Modification

Step 2: For more in-depth research on the five mass extinctions, to provide different resources for additional team members, or for added differentiation, access the [Five Mass Extinctions Curated Resources](#).

Modification

Step 4: As the concept of a sixth mass extinction might make some students anxious, ensure that your students are ready to have this discussion. If this would be too anxiety-inducing in students, skip to the part of this step that asks students to create initial responses to the unit driving question or lesson driving question.

Informal Assessment

[Five Mass Extinctions Four-Square](#): As student teams present their collaborative Four-Square charts to the class, evaluate the thoroughness with which each team uses the provided graphic organizer to construct its supporting evidence into an organized, coherent, and presentable argument that expresses the following: the primary reason(s) for their assigned mass extinction; inferences about the extinction's effects, and possible factors, if any, that might have mitigated or prevented tragedy.

OBJECTIVES

Subjects & Disciplines

Social Studies

- Civics
- U.S. History

Teaching Approach

- Project-based learning

Teaching Methods

- Cooperative learning
- Discussions
- Multimedia instruction

Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
 - Information, Media, and Technology Skills
 - Information, Communications, and Technology Literacy
 - Learning and Innovation Skills
 - Communication and Collaboration
 - Critical Thinking and Problem Solving
- 21st Century Themes
 - Environmental Literacy
 - Global Awareness
- Critical Thinking Skills
 - Analyzing
 - Applying
 - Evaluating

- Understanding
- Geographic Skills
- Analyzing Geographic 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.

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

- Butcher paper
- Chart paper
- Markers

REQUIRED TECHNOLOGY

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

PHYSICAL SPACE

- Classroom

GROUPING

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

RESOURCES PROVIDED: UNDEFINED

- • Pixeldust Studios: Curiosity Stream Series: Ancient Earth: The Permian

RESOURCES PROVIDED: HANDOUTS & WORKSHEETS

- [Five Mass Extinctions Four-Square](#)
- [Five Mass Extinctions Curated Resources](#)

RESOURCES PROVIDED: REFERENCE

- Extinction

RESOURCES PROVIDED: IMAGES

- Mass Extinctions

RESOURCES PROVIDED: ARTICLES & PROFILES

- American Museum of Natural History: Shelf Life: Episode Twelve: Six Extinctions in Six Minutes

BACKGROUND & VOCABULARY

Background Information

More than 90 percent of all organisms that have ever lived on Earth are now extinct. The planet's five mass extinctions resulted in the disappearance of 50-90 percent of all species within a span of 500 million years—a large span of time to humans, but in the blink of an eye in geological terms.

Earth's first five mass extinction events were:

- Ordovician, ~444 million years ago, ~86 percent of species lost
- Devonian, ~375 million years ago, ~75 percent of species lost
- Permian, ~252 million years ago, ~96 percent of marine species lost
- End Triassic, ~200 million years ago, ~80 percent of species lost
- Cretaceous, ~66 million years ago, ~76 percent of all species lost

Prior Knowledge

[]

Recommended Prior Activities

- None

Vocabulary

Term	Part of Speech	Definition
Anthropocene	<i>noun</i>	period of time during which human activities have impacted the environment enough to constitute a distinct geological change.
biodiversity	<i>noun</i>	all the different kinds of living organisms within a given area.
endangered species	<i>noun</i>	organism threatened with extinction.
extinction	<i>noun</i>	process of complete disappearance of a species from Earth.
mass extinction	<i>noun</i>	extinction event in which a large number of species go extinct in a relatively short period of time.
Permian	<i>adjective</i>	last geologic period of the Paleozoic Era.
species	<i>noun</i>	group of similar organisms that can reproduce with each other.
stewardship	<i>noun</i>	responsible management to ensure benefits are passed on to future generations.

For Further Exploration

Articles & Profiles

- [World Atlas: Timeline of Mass Extinction Events on Earth](#)
- [National Geographic: Mass Extinctions](#)
- [National Geographic: What Is Extinction? The Answer May Surprise You](#)

Instructional Content

- [National Geographic: Preserving Critical Species: Inquiry to Action](#)

Video

- [National Geographic: Survival of the Fittest](#)
- [Leon Fitzpatrick: The Sixth Mass Extinction](#)

Websites

- [National Geographic: Resource Library Extinction Collection](#)



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