

**Title: Wrinkle in Time**

**Time:**

Activity 1 (Eco-Illustrations): 90 minutes

Activity 2 (Extinction Then and Now): 40 minutes

Activity 3 (Science Forum): 90 minutes

Film (*Sea Monsters: A Prehistoric Adventure*): 40 minutes

**Materials Required:**

- Copies of the handout: Creating a Graphic Organizer (optional)
- Copies of the Glossary (optional)
- Computers with Internet access or library resources

**Objectives:**

Students will

- gain background knowledge on extinction and related terms;
- create an illustrated brochure;
- research the extinction of prehistoric marine animals and threats to modern-day marine animals;
- use a graphic organizer to structure research;
- learn about the extinction of prehistoric marine animals and threats to contemporary marine animals;
- create a presentation; and
- participate in a science forum.

**Overview:** Students compare and contrast causes for extinction, past and present. In Activity 1, students gain background knowledge on the topic of extinction and related terms by creating a three-section illustrated brochure. In Activity 2, students conduct research on the extinction of prehistoric or modern marine animals and compile graphic organizers summarizing what they learned. In the Closing Activity, students compare research findings, synthesize information, and create and present their summaries in a science forum.

This lesson is one in a series designed to accompany the National Geographic film, *Sea Monsters: A Prehistoric Adventure*. It was developed and reviewed with input from scientists, teachers and museum educators.

**Connections to the Curriculum:**

Geography, science, language arts

**Connections to the National Geography Standards:**

Standard 14: "How human actions modify the physical environment"

**Standard 17: "How to apply geography to interpret the past"**

Standard 18: "How to apply geography to interpret the present and plan for the future"

National Science Education Standards

- Science Content Standard C: "Life Science—Biological evolution, interdependence of organisms, behavior of organisms"

National Language Arts Standards

- Language Arts Standard 3
- Language Arts Standard 5

**Geographic Skills:**

**Acquiring Geographic Information**  
**Organizing Geographic Information**  
**Answering Geographic Questions**  
**Analyzing Geographic Information**

**Suggested Procedure****Opening:**

**Guiding Question:** What factors contribute to the extinction of a species? Have these factors changed over time?

**Try This First!**

In 2004, there were an estimated 15,589 species on the "threatened list." Ask students if they believe that species today could become extinct, like many, if not all, of the dinosaurs did. (Some paleontologists believe that birds are descendants of dinosaurs.) Discuss what people can do to protect species from extinction.

Source: World Conservation Union (IUCN) *2004 Red List of Threatened Species. A Global Species Assessment*

- [iucnredlist.org/info/introduction](http://iucnredlist.org/info/introduction)

**Development:*****Activity 1: Eco-Illustrations***

Students do online or library research to gain background knowledge on extinction and related terms in order to create an illustrated brochure.

**Directions:**

**1. Staging the activity.** Divide the class into eight groups. Assign each group one of the following terms:

- Extinction
- Biodiversity
- Habitat
- Climate change
- Conservation
- Sustainability
- Evolution
- Endangered species

**2. Instructions.** Explain that each group will research its term and create a brochure. Each brochure should include:

- The word and its definition
- An original symbol that illustrates the meaning of the word
- A brief description of the symbol's meaning
- Excerpts of three news articles from the past year that include the term in context
- Research sources

*Note: Students may present their work as a Word document, PowerPoint slide presentation, a web page, or a short video clip.*

**3. Students' presentations.** Have each group share its brochure with the entire class. Tell students that they will use their brochures in a science forum in the Closing Activity.

Students should view *Sea Monsters: A Prehistoric Adventure* prior to Activity 2.

### ***Activity 2: Extinction Then and Now***

Students research the extinction of prehistoric marine animals and threats to current-day marine animals and develop graphic organizers to structure their research.

#### **Directions:**

**1. Instructions.** Explain that students will use online or library resources to research animal extinction—past or present—and that they will create a graphic organizer with their findings. Tell students that they will later use their research in a science forum in the Closing Activity.

*Note: If helpful to students, distribute and review Creating a Graphic Organizer, an optional resource available online.*

- [nationalgeographic.com/xpeditions/guides/graphicorg.pdf](http://nationalgeographic.com/xpeditions/guides/graphicorg.pdf)

**2. Divide the class into small groups.** If possible, divide class into an even number of small groups. Half of the groups will research the extinction of prehistoric marine animals; the other half will research current threats to modern marine animals. Each group should select one animal on which to focus their research.

*Note: Remember to collect and save completed graphic organizers for the Closing Activity.*

**3. Allot time for students to prepare presentations.**

#### **Closing:**

##### ***Science Forum***

Students integrate the factual knowledge they have learned about the extinction of prehistoric marine animals and threats to contemporary marine animals through the creation and presentation of their research findings in a science forum.

#### **Directions:**

**1. Divide the Class into Research Teams.** Each team should include students who researched prehistoric extinction and students who researched present day conditions.

**2. Instructions.** Tell students they are going to prepare presentations as part of a science forum. To complete this activity, each team should:

- Prepare a seven- to ten-minute presentation comparing and contrasting the extinction of prehistoric marine animals and threats to today's endangered species.
- Incorporate brochures and graphic organizers produced in Activities 1 and 2.
- Include an action plan with at least three suggestions for what people can do to help species currently deemed to be under threat of extinction.

**3. Presentations and Discussion.** Have students regroup to make presentations and participate in a science forum. After each group has finished its presentation, lead the

class in a discussion reviewing key points on the threats to the current environment, the possible lessons we can learn from the past, and what people can do to protect threatened species today.

**Suggested Student Assessment:**

Rate the students on a scale of one to five based on the following components:

- comparison of extinction of prehistoric marine animals and the threats to today's marine animals;
- quality of information in brochure;
- quality of synthesis in graphic organizer;
- suggestions for what to do to help threatened species; and
- participation in forum discussion.

**Extending the Lesson:**

**Adaptations**

- If students have difficulty with these terms, you may wish to spend additional time reinforcing the meanings of the words. One way you can do this is by having the students write sentences using the vocabulary words in context to demonstrate that they understand the definitions.

Some students may need additional time and support to complete their research and their graphic organizers. You can read information aloud, make predictions, ask students to restate what they read, and model note taking strategies to enhance comprehension. Remember to clarify any difficult concepts, and encourage students to focus on the reasons for extinction and threats to species.