

Muse®

The Edge of Extinction

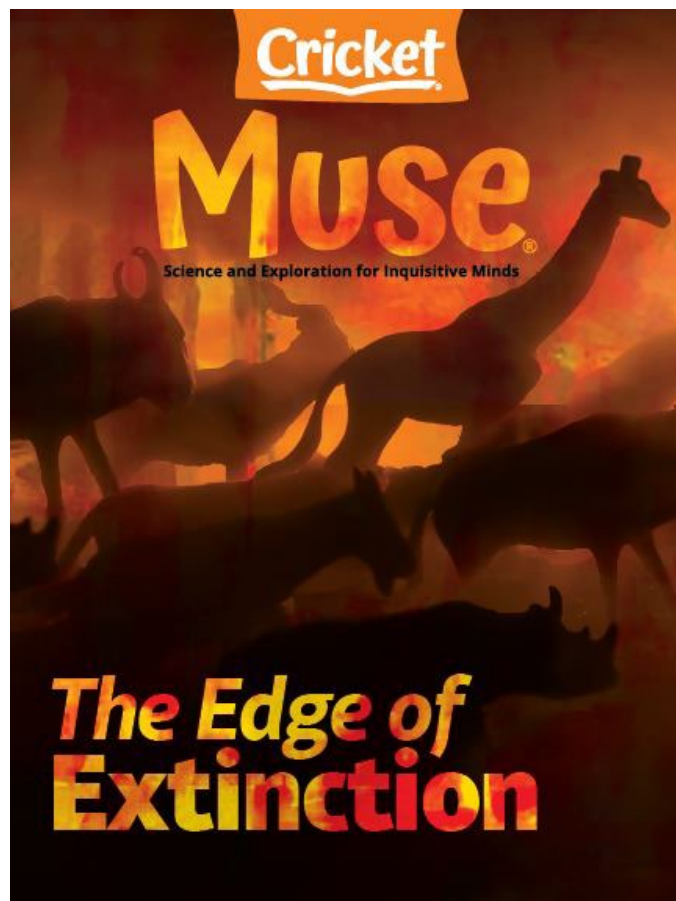
The United Nations has concluded that “humans are transforming the Earth’s natural landscapes so dramatically that as many as one million plant and animal species are now at risk of extinction.” This month’s issue of MUSE magazine delves into the state of the planet and provides information about how people are fighting to save plants and animals species.

CONVERSATION QUESTION

How do humans impact extinction rates?

TEACHING OBJECTIVES

- Students will learn how the sea cow became extinct.
- Students will analyze the driving forces behind the biodiversity crisis that could lead to mass extinction.
- Students will learn about the conservation efforts being made to save giant tortoises.
- Students will explain a sequence of events.
- Students will examine solutions to a problem.
- Students will collect evidence to support a claim.
- Students will use a sentence frame to create alliterative titles.
- Students will become informed citizen scientists.
- Students will design a travel brochure for the Galápagos Islands.



In addition to supplemental materials focused on core STEM skills, this flexible teaching tool offers vocabulary-building activities, questions for discussion, and cross-curricular activities.

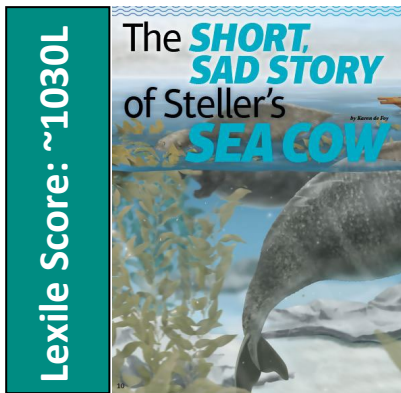
SELECTIONS

- **The Short, Sad Story of Steller’s Sea Cow**
Expository Nonfiction, ~1030L
- **The Sixth Mass Extinction**
Expository Nonfiction, ~930L
- **Slow & Steady in the Galápagos Islands**
Expository Nonfiction, ~1050L

The Short, Sad Story of Steller's Sea Cow

pp. 10–14, Expository Nonfiction

Readers will board the Russian exploration ship *St. Peter* and go back in time to be shipwrecked in a region teeming with strange sea creatures, including sea cows. These majestic creatures provided life-saving sustenance for the crew, but were over-hunted and became extinct by 1768.



RESOURCES

- Sequence of Events: All Gone

OBJECTIVES

- Students will learn how the sea cow became extinct.
- Students will explain a sequence of events.
- Students will use a sentence frame to create alliterative titles.

KEY VOCABULARY

- **carcasses** (p. 12) the bodies of dead animals
- **primitive** (p. 12) very simple and basic; having a quality that offers an extremely basic level of comfort, convenience, or efficiency
- **sanctuaries** (p. 14) places where someone or something is protected or given shelter

ENGAGE

Conversation Question: How do humans impact extinction rates?

Pose the Conversation Question to the class. Instruct students to create a three-column chart with the headings “Land,” “Sea,” and “Air.” Discuss and list ways that humans are negatively affecting the quality of all three ecosystems and what is being done to try to reverse the damage. Ask students how they can be part of the solution.

INTRODUCE VOCABULARY

Post and discuss the three vocabulary words and definitions. Have students Think-Pair-Share with a partner. Give them the following directives, one at a time:

1. What kinds of animal **carcasses** might you see in your region?
 2. Describe the materials/tools/process you might use to construct a **primitive** camping shelter in the woods.
 3. How do **sanctuaries** help endangered species?
- Emphasize the key words as they are revealed in the reading.

READ & DISCUSS

Reinforce comprehension of the concepts presented in the article by using the following questions to direct discussion.

1. How did the shipwrecked men of the *St. Peter* eat prior to hunting and killing the sea cows?
2. How did the naturalist Wilhelm Steller describe sea cows?
3. What method did the men of the *St. Peter* use to hunt sea cows?
4. What did Jakovleff observe that alarmed him?
5. Why was the idea of extinction not widely accepted in the mid-18th century? What discoveries later changed this view?

SKILL FOCUS: Sequence of Events

INSTRUCT: This article presents readers with detailed information regarding the sequence of events that led to the ultimate demise of Steller's sea cow. Present the *Sequence of Events: All Gone* graphic organizer. Tell students they will record relevant details from the article related to the sea cow's path to extinction. Tell students to include both significant events and harmful practices.

ASSESS: Review the worksheet with the class. Challenge students to make a horizontal timeline to post specific dates and corresponding events.

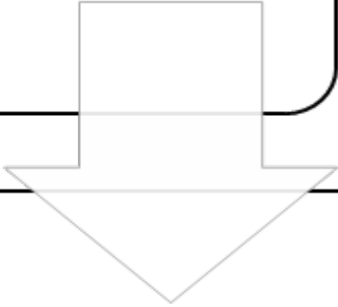
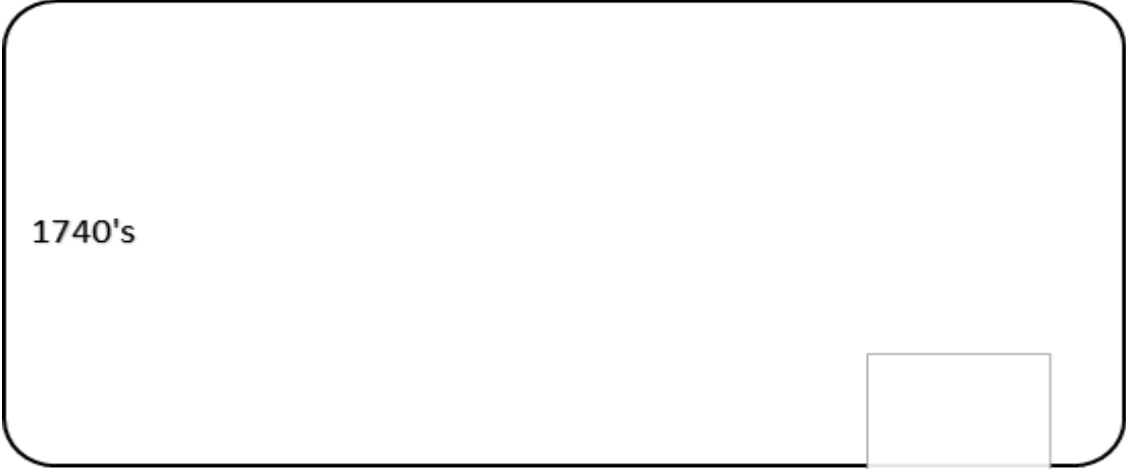
EXTEND

Language Arts On the board, post the title of the article, “The Short, Sad Story of Steller's Sea Cow,” and guide students to identify the alliteration. (Alliteration is the close repetition of the same beginning sounds in words.) Have students copy the sentence frame to create other animal titles: *The _____, _____ Story of _____'s _____*. (Example: *The Cute, Curious Story of Katherine's Cat*) Encourage students to write a brief synopsis of the story that matches their title.

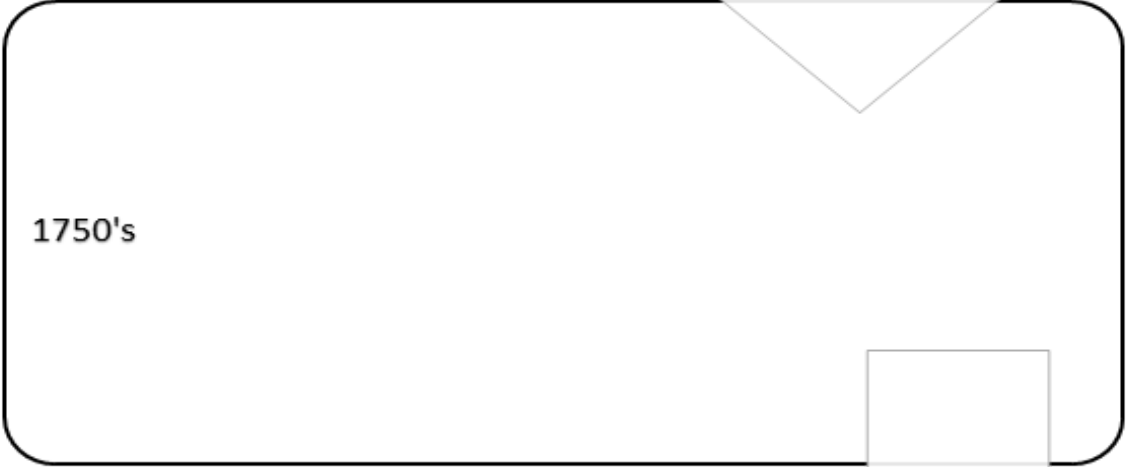
All Gone

Explain Sequence: Note events and details from each decade that led to the sea cow's extinction.

1740's



1750's



1760's



The Sixth Mass Extinction

pp. 16–20, Expository Nonfiction

Current predictions by some scientists suggest that the next mass extinction, if not stopped, may be the largest of Earth’s history. Readers will learn about the factors that are driving us toward this biodiversity crisis and the measures we can take to stop—and possibly reverse—our course.



RESOURCES

- Problem and Solutions: Save the Planet

OBJECTIVES

- Students will analyze the driving forces behind the biodiversity crisis that could lead to mass extinction.
- Students will examine solutions to a problem.
- Students will become informed citizen scientists.

KEY VOCABULARY

- **ecosystem** (p. 18) a biological community of interacting organisms and their environment
- **biodiversity** (p. 18) the existence of many different kinds of plant and animal life on the earth or in a particular environment

ENGAGE

Conversation Question: How do humans impact extinction rates?

Introduce the article, “The Sixth Mass Extinction,” and inform students that the article lists the percentages of animal species in danger. Have students calculate the total number of each species in danger. The first one has been completed.

Animal Species	Current Number	Percentage Disappearing	Number of Species Threatened
Mammals	12,000	25%	3,000
Reptiles	10,000	20%	
Birds	18,000	13%	

INTRODUCE VOCABULARY

Post and read aloud the vocabulary words and definitions. Then display the following questions and have students work in pairs or groups to answer them. Invite volunteers to share their ideas.

1. Based on the meaning of the word *ecosystem*, what do you think the word parts “eco” and “system” mean?
2. Based on the meaning of the word *biodiversity*, what do you think the word parts “bio” and “diversity” mean?

READ & DISCUSS

Post the questions prior to reading. After students read independently, read the article aloud, pausing when answers are revealed. Encourage students to elaborate.

1. How did the fifth mass extinction event allow mammals to flourish?
2. How have humans radically altered the natural environment?
3. What is the importance of genetic diversity?
4. Why do mass extinction events occur?
5. What is driving the biodiversity crisis and the Sixth Mass Extinction?

SKILL FOCUS: Problem and Solutions

INSTRUCT: Inform students that they will be rereading the article with a partner and highlighting passages that describe the primary problem in the article and how people are trying to solve it. Distribute copies of the *Problem and Solutions: Save the Planet* graphic organizer. Tell students they will record the problem and the solutions in the chart.

ASSESS: Collect the worksheets to evaluate the students’ ability to clearly identify the problem and solutions.

EXTEND

Philanthropy Suggest students join a citizen science project to engage with conservation in their area. Magazine page 20 suggests visiting SciStarter or CitizenScience websites to find local projects.

Save the Planet

Problem and Solutions Use information from the article to complete the chart below. Identify the primary problem in the article and then use information from the article to provide a variety of solutions.

Problem:

This is how **scientists** are helping:

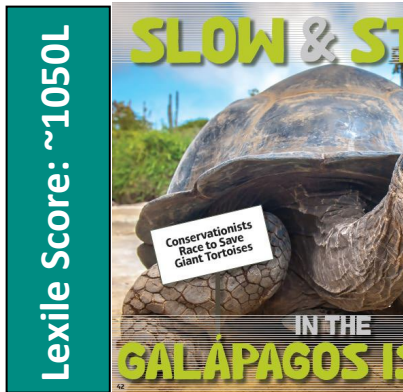
This is how **I** can help:

Muse® Teacher Guide: September 2022

Slow & Steady in the Galápagos Islands

pp. 42–45, Expository Nonfiction

Giant tortoises play a critical role in the survival of other plants and animals of the Galápagos Islands. Readers will learn about the race to save the dwindling population of these noble creatures.



RESOURCES

- Collecting Evidence: Steadier & Stronger

OBJECTIVES

- Students will learn about the conservation efforts being made to save giant tortoises.
- Students will collect evidence to support a claim.
- Students will design a travel brochure for the Galápagos Islands.

KEY VOCABULARY

- keystone species (p. 43)** a species on which other species in an ecosystem largely depend, such that if it were removed, the ecosystem would change drastically
- terrestrial ecosystem (p. 44)** a land-based community of organisms

ENGAGE

Conversation Question: How do humans impact extinction rates?

Inform students that this article tells the story of an animal on the verge of extinction. Display a world map and give students the following clues, one at a time, so that they can locate the place where this animal lives. (Galápagos Islands)

- This place is located in both the southern and northern hemispheres.
- This place is part of South America.
- This place is made up of an archipelago of volcanic islands in the Pacific Ocean.
- This place is part of the country of Ecuador.

INTRODUCE VOCABULARY

Display the following sentences and underline the key vocabulary words. Then have students work in pairs to determine the meaning of each vocabulary word using context clues. Then reveal definitions.

- The otters are the keystone species of a coastal ecosystem called kelp forests.
- Rainfall is usually a limiting factor for plants in most terrestrial ecosystems.

READ & DISCUSS

Have students read the article in small groups to answer the questions below. Share responses.

- Why are tortoises necessary for a healthy island ecosystem?
- When and how did the first giant tortoises arrive in Galápagos?
- How were whalers and pirates responsible for the dwindling tortoise population?
- What is the Galápagos Initiative?
- What did Tapia discover during his expedition to Wolf Volcano?

SKILL FOCUS: Support a Claim

INSTRUCT: This article presents readers with detailed information about conservation efforts in the Galápagos Islands. Present the *Collecting Evidence: Steadier & Stronger* graphic organizer. Tell students they will review the article and highlight details that provide evidence to support each of the claims in the organizer. After they have identified relevant evidence, they will record the information, citing detail/page numbers.

ASSESS: Arrange peer group review. Circulate, listen, and guide.

EXTEND

Geography Instruct students to fold a piece of paper into thirds and create a travel brochure for the Galápagos Islands. You could also use online brochure templates. Brochures should include an eye-catching cover; details about location, climate, history, wildlife, and attractions; fun activities and trivia; photos, maps, and drawings.

Steadier & Stronger

Collecting Evidence Gather evidence from the text to support each claim. Include details and cite your findings by using page numbers.

Claim: Giant tortoises are a keystone species for the Galápagos Islands.

Supporting evidence (P. _____)

Claim: Trouble began in the 18th century, when whalers and pirates arrived in the Galápagos Islands.

Supporting evidence (P. _____)

Claim: The Galápagos Conservancy and Galápagos National Park have been working together for decades to repopulate giant tortoises and save them from extinction.

Supporting evidence (P. _____)