

# muse®

## Afterlives: The End Is Just the Beginning

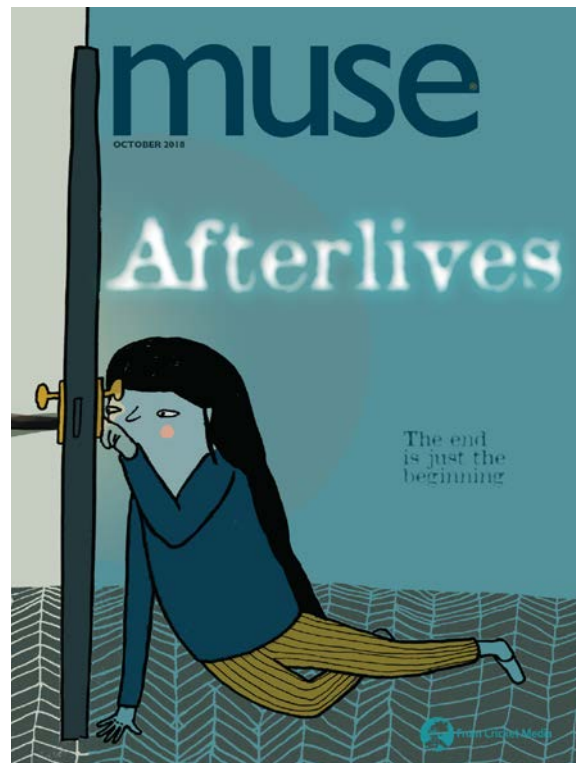
Humans have a long history of being obsessed with the afterlife. Scientists are developing de-extinction techniques that will literally raise the dead. Cross over into this issue of MUSE and explore the possibilities.

### CONVERSATION QUESTION

How do scientists explore the possibility of life after death?

### TEACHING OBJECTIVES

- Students will read and analyze a nonfiction article.
- Students will learn how scientists are attempting to reintroduce the woolly mammoth to the world.
- Students will learn about the history and methods used to try to contact the spirit world.
- Students will learn how the solar system will transform when the sun dies.
- Students will compare and contrast the features and traits of different animals.
- Students will identify cause-and-effect relationships.
- Students will examine the interconnectedness of relationships.
- Students will create a timeline indicating the extinction of various animals.
- Students will demonstrate their understanding of alliterations.
- Students will create mathematical word problems based on the solar system.



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

- **Mammoth Return?**  
Expository Nonfiction, ~1050L
- **Seriously Spooky Séances**  
Expository Nonfiction, ~550L
- **The Afterlife of the Solar System**  
Expository Nonfiction, ~1050L

## Mammoth Return

pp. 10–15, Expository Nonfiction

Gone from our planet for nearly 3,700 years, the woolly mammoth may be on the path to de-extinction. Learn how scientific advancements are making it possible to raise long-gone creatures from the dead.



## RESOURCES

- Mammoth Musings

## OBJECTIVES

- Students will learn how scientists are attempting to reintroduce the woolly mammoth to the world.
- Students will compare and contrast the features and traits of different animals.
- Students will create a timeline indicating the extinction of various animals.

## KEY VOCABULARY

- **demise** (p. 12) an ending of existence
- **diversity** (p. 12) being composed of differing elements
- **revitalize** (p. 12) to give new life to
- **vibrancy** (p. 15) the quality of pulsating with life or activity

## ENGAGE

**Conversation Question:** How do scientists explore the possibility of life after death?

Have students list as many extinct animals as they can. Invite them to discuss reasons for extinction and possible technologies that may now exist to prevent, or possibly reverse extinction.

## INTRODUCE VOCABULARY

Post key words and definitions on the board. Have students underline/highlight the sentences where these words appear. Upon completion of reading, instruct the class to rewrite the sentences substituting a valid synonym for each vocabulary term.

## READ & DISCUSS

Have the students read the article aloud within groups. Reconvene the class and use the following questions to ensure a comprehensive understanding of the article.

- Describe the features and behaviors of a woolly mammoth.
- Why did the mammoth become extinct?
- How is de-extinction becoming possible?
- Explain why scientists cannot bring back extinct animals using cloning.

## CONCEPT/SKILL FOCUS: Compare

**INSTRUCT:** Divide the class into small groups and have each note passages that address both elephants and the woolly mammoth. Have students use the organizer to compare these two animals. Allow them to share their work with other groups and amend their charts, if necessary. Then, instruct them to write their answers to the final question on the page.

**ASSESS:** Collect the graphic organizer to determine if students were accurately able to compare/contrast information from the text. Evaluate understanding by reviewing independent answers to the final question.

## EXTEND

**History** Have the students research other animals that have disappeared over time. Direct them to create a timeline with dates, names, and pictures that indicate when each animal vanished. Pose the question, “If you could bring back one animal from extinction, which would it be? Why?”

# Mammoth Musings

*Use evidence from the article, "Mammoth Return," to compare the woolly mammoth and the elephant.*

How are they alike?	How are they different?

*How do scientists expect elephants to play a role in the de-extinction of mammoths?*

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## Seriously Spooky

### Séances

pp. 28–32, Expository Nonfiction

Take a journey into the spirit realm. This article exposes the fraudulent methods used by mediums of the past, while acknowledging our desire to believe the unbelievable.

Lexile Score: ~550



## RESOURCES

- A Bump in the Night

## OBJECTIVES

- Students will learn about the history and methods used to try to contact the spirit world.
- Students will identify cause-and-effect relationships.
- Students will demonstrate their understanding of the literary device, alliteration.

## KEY VOCABULARY

- **séance (p. 30)** a meeting at which people attempt to make contact with the dead
- **spiritualism (p. 30)** a system of belief based on supposed communication with the spirits of the dead
- **supernatural (p. 29)** attributed to some force beyond scientific understanding or the laws of nature

## ENGAGE

**Conversation Question:** How do scientists explore the possibility of life after death?

Tell students that people have many different beliefs about what happens after a person dies. Ask students to share ideas they've heard, and list them. Then ask students which ones can be proven with evidence. Point out that many beliefs don't have scientific evidence, and briefly discuss why people might still value them. (Stress respect for different belief systems.)

## INTRODUCE VOCABULARY

List the key vocabulary terms on the board and have students use resources to define them accurately. Ask them to consider how the words are related and to make a prediction about the content of the article. Revisit the students' predictions after the reading.

## READ & DISCUSS

Pose the following questions to the students to facilitate meaningful discussion.

- How did the Fox sisters begin a "creepy craze"?
- Why do you think people are eager to contact the spirit world?
- Can science explain the information reported by mediums?

## CONCEPT/SKILL FOCUS: Cause and Effect

**INSTRUCT:** While exploring the history of séances, this article also exposes the methods used by fraudulent mediums. Introduce the graphic organizer, *A Bump in the Night*, and advise the students that they will be looking for cause-and-effect relationships throughout the text. Circulate and provide clarification if necessary.

**ASSESS:** Evaluate the students' work on the graphic organizer. Arrange peer groups to provide scaffolding.

## EXTEND

**Language Arts** Guide the students to notice the use of alliteration throughout the article (*Seriously Spooky Séances*, *Creepy Craze*, etc.). Review the definition of alliteration and discuss why it is an effective literary tool. Have students rewrite simple nouns using this device (e.g., *roller coaster* could become *Rumbling Roller*; *lizard* could become *Lazy Lizard*).

# A Bump in the Night

Page #	Cause/Behavior	Effect/Result
p. 32	Mary Todd Lincoln's photographer used double exposures.	The spirit of Abraham Lincoln appears to be present in the photograph taken of Mary Todd Lincoln.

## The Afterlife of the Solar System

pp. 40–45, Expository Nonfiction

This fascinating article takes the reader on a tour of our solar system as it exists today and projects how it will be transformed when the sun ultimately dies. Stargaze 5 billion years into the future and imagine a starkly different universe.



### RESOURCES

- Lights Out

### OBJECTIVES

- Students will learn the how the solar system will transform when the sun dies.
- Students will examine the interconnectedness of relationships.
- Students will create mathematical word problems based on the solar system.

### KEY VOCABULARY

- **contract (p. 44)** decrease in size
- **fusion (p. 42)** process of causing an object to melt with intense heat so as to join with another
- **transform (p. 42)** make a dramatic change in the form, appearance, or character

### ENGAGE

**Conversation Question:** How do scientists explore the possibility of life after death?

Activate prior knowledge by asking students to predict what will happen when the sun begins to die. Ask them to consider Earth, as well as the other planets in the solar system.

### INTRODUCE VOCABULARY

Post vocabulary words where they are visible to the class. Begin reading “The Afterlife of the Solar System” and instruct the class to underline the sentences in which they appear. Challenge students to infer the meaning of each term, and then to check resources for accuracy. Record in Science notebook.

### READ & DISCUSS

Reinforce comprehension of the concepts in this article by using the following prompts to direct discussion.

- Describe a typical star.
- What do scientists predict will happen when the sun is 10 billion years old?
- Why do scientists believe that life has a real chance on Titan?
- How will the habitable zone change over time?

### CONCEPT/SKILL FOCUS: Relationships

**INSTRUCT:** Review the information presented in the article. Distribute the *Lights Out* graphic organizer and instruct students to examine the interconnectedness of the concepts and terms listed. Direct students to use the details and graphics from the text to thoroughly explain and record the relationships.

**ASSESS:** Circulate and discuss the information that students are recording on their organizers. Collect the finished work and remediate if necessary.

### EXTEND

**Mathematics** Have students research the distance of planets relative to each other, as well as to the sun. Model a word problem that incorporates such information. Challenge students to create their own word problems for their classmates to solve. Check for accuracy. Have them create multistep word problems using a variety of mathematical operations.

## Lights Out

*Explain the relationship between the objects/concepts listed.*

red giant ↔ white dwarf

hydrogen ↔ helium

liquid water ↔ sustainability of life

planets ↔ moons

sun's death ↔ solar system