Sample Lesson

Phenomena
“The Year Without a Summer,” pages 4–11

Summary
The spring of 1816 in New England had been cold and damp, but it was nothing compared to the summer. Snow started to fall on June 6 and continued for the next five days. Then from July 5 to July 9, the temperatures fell to near freezing. In August, frost killed crops in New Hampshire and Maine. In addition to the unusual cold, the colors seen in the sky were unusually brilliant. What caused this bizarre weather? Scientists blamed a huge cloud—the result of a volcanic eruption at Mount Tambora in Indonesia—that blocked some of the sun’s rays from reaching Earth.

BEFORE READING

Build Vocabulary
List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the following questions on the board. Read the questions aloud and discuss the answers with students.

- grumbled: complained
- incredible: unbelievable
- hardy: tough
- frigid: extremely cold
- plagued: cursed

1. What word goes with “Arctic winter”? (frigid)
2. What word goes with “hard to believe”? (incredible)
3. What word goes with “diseased”? (plagued)
4. What word goes with “protested”? (grumbled)
5. What word goes with “strong and healthy”? (hardy)

Activate Prior Knowledge

1. Have students name the New England states (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut) and discuss the weather there during the different seasons.
2. Have students find Indonesia, Mount Tambora, the New England states, Canada, and Europe on a map. Guide them to notice the distance between Mount Tambora and New England.
3. Ask students to name volcanoes and volcanic eruptions they have read or heard about. Ask what happens during an eruption.

Preview
Ask students what clues the title of the article, the photographs, and the photo captions provide. What predictions about the article might students make? (Possible answer: This article will tell how things like a volcanic eruption can drastically affect our weather.)

DURING READING

Cause and Effect
A cause is an event or action that makes something else happen. An effect is the result or the outcome of that action. Writers use clue words such as because, so, since, if, and therefore to signal cause and effect. Have students look for cause-and-effect relationships by asking: What happened? Why?

ENGLISH LANGUAGE LEARNERS
Have students fold pieces of paper in half lengthwise and label the left side Causes and the right side Effects. Ask students to draw sketches or cut pictures from magazines that show cause-and-effect relationships. For example, they might draw or place pictures of people in a crosswalk on the left and stopped cars on the right.

GRAPHIC ORGANIZERS
Use Graphic Organizer 9 as a Cause-and-Effect Chart. Remind students that one cause can have multiple effects. Then ask students to write the following cause in the box on the left. In the boxes on the right, have them write three effects of the cause.

Cause
In 1816 there was a volcanic eruption on Mount Tambora.

AFTER READING

Respond to the Article
Have students write a journal or blog entry about their responses to the information in the article. Ask students: How would you feel if it snowed all summer? Why? What can you learn about how nature affects people from reading this article?
**Unit 1, Lesson 1**

**Phenomena**

"The Wild Boy of Aveyron," pages 14–21

<table>
<thead>
<tr>
<th><strong>Introduce</strong></th>
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<tbody>
<tr>
<td><strong>Summary</strong> In January 1800 a tanner found the Wild Boy of Aveyron digging for vegetables in the tanner’s garden. The boy did not speak and seemed more like an animal than a person. When no parents claimed the boy, he was sent to a school for deaf mutes in Paris. Late in 1800 a doctor who became interested in the boy named him Victor, provided him with a caretaker, and tried to teach him. Victor learned simple tasks and even letters of the alphabet, but he never learned to speak. The doctor gave up after five years, and Victor and his caretaker moved into a small house where they lived until Victor died in 1828.</td>
</tr>
</tbody>
</table>

**BEFORE READING**

**Build Vocabulary** List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the following questions on the board. Read the questions aloud and discuss the answers with students.

<table>
<thead>
<tr>
<th><strong>Word</strong></th>
<th><strong>Definition</strong></th>
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<tbody>
<tr>
<td>tattered</td>
<td>ragged</td>
</tr>
<tr>
<td>squatted</td>
<td>crouched</td>
</tr>
<tr>
<td>prowled around</td>
<td>sneaked around</td>
</tr>
<tr>
<td>foul play</td>
<td>a violent act</td>
</tr>
<tr>
<td>abandoned</td>
<td>neglected</td>
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</table>

1. Would you expect people to wear tattered clothes to a wedding? Why or why not?
2. If you squatted, were your legs straight or bent?
3. Would you be more surprised if a bear or a dog prowled around your house? Why?
4. Which might suggest foul play—a soccer player scoring a goal or a person with unexplained injuries? Why?
5. If you found an abandoned kitten, would it be okay to take it home and care for it? Why or why not?

**Activate Prior Knowledge**

1. Explain that in Greek myth, Romulus and Remus, Rome’s founders, were raised by a wolf. Have students name other fictional characters that were raised by animals. (Possible answers: Tarzan, Mowgli)
2. Have students discuss how children learn to speak, to read, and to be social. Ask how growing up in different environments might affect how children learn these skills.

**Preview** Ask students what clues the title of the article, the paintings, and the captions provide. What predictions about the article might students make? (Possible answer: The article will be about a boy who lived in the wild in Aveyron, France, during the early 19th century.)

**DURING READING**

**Identify Sequence** Sequence is the order in which events, ideas, or things are arranged. Time order refers to the order in which events occur. Following the sequence of events helps you see how the text is organized and how events relate to each other. As students read, ask them to look for key words such as meanwhile, after, before, finally, soon, next, when, and first.

**AFTER READING**

**Respond to the Article** Have students write a journal or blog entry about their responses to the Wild Boy and his treatment. Ask students: How do you think the Wild Boy survived for so long before the tanner found him? How would you describe the different people who tried to help the Wild Boy? What do you think would happen to the Wild Boy if he were found today?

**DIFFERENTIATED INSTRUCTION** Explain that the most common types of sequence are time order, spatial order, order of importance, and steps in a process. Time order refers to where things are in relation to one another. Order of importance refers to events or ideas arranged from most to least important. Steps in a process refers to the order in which something is done, such as following a recipe.

**ENGLISH LANGUAGE LEARNERS** Have students describe events from their past in time order or explain things they can do using steps in a process. Prompt them to use signal words in their descriptions. Have students create time lines of the events they are describing as a visual aid.

**GRAPHIC ORGANIZERS** Use Graphic Organizer 5 as a Sequence-of-Events Chart. Ask students to write the following events in the order in which they happened.

A doctor tried to teach the boy how to talk.
A tanner found the boy in his garden.
The boy learned to recognize letters and shapes.
The boy was sent to a school for deaf mutes.
# Unit 1, Lesson 2

## Phenomena

### “Voodoo Magic,” pages 22–29

## Teach Lesson Skills

### Introduce

**Summary**

In 1969 a 22-year-old woman who was under a voodoo curse died from what some doctors believed was extreme terror. Other people, however, believed she died a “voodoo death.” The voodoo religion, originating in Africa, incorporates magic and a strong belief in a spirit world. In Haiti, many people believe that nothing is beyond the reach of voodoo magic. Believers fear not only voodoo curses but the creation of zombies, or the “walking dead,” as well. Zombies are people with no souls or minds whose bodies are believed to have been resurrected after death by voodoo priests.

## Before Reading

### Build Vocabulary

List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the sentences that contain the words on the board. Read the sentences aloud and discuss them with students.

<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
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<tbody>
<tr>
<td>hexed</td>
<td>cursed</td>
</tr>
<tr>
<td>vital</td>
<td>essential</td>
</tr>
<tr>
<td>dominates</td>
<td>has great power over</td>
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1. In some movies, people are **hexed** by magic spells.
2. Your heart and your lungs are two of your body’s **vital** organs.
3. In some paintings, you notice one color immediately because it **dominates** all the others.

### Activate Prior Knowledge

1. Have students find Haiti on a map and ask them to share what they know about the country.
2. Ask students to brainstorm words that go with **voodoo**. Record their responses in a concept web. (Possible answers: zombie, hex, curse, Haiti, voodoo doll, spell)

### Preview

Ask students what clues the title of the article, the images, and the captions provide. What predictions about the article might students make? (Possible answer: The article is about voodoo magic, in which people are believed to be brought back to life from the dead. I think it will also tell about voodoo medicine, which is still practiced in Haiti and Brazil.)

### During Reading

### Find Vocabulary in Context

As students read the article, have them note the new vocabulary words. Ask them to think about each word’s meaning as they read.

### AFTER READING

### Respond to the Article

Have students write a journal or blog entry about their responses to voodoo. Ask students: Why do you think the woman in the Baltimore died? How would you explain the deaths of the other two girls born on Friday the 13th? What is the author’s viewpoint about voodoo? Do you agree? Why or why not?

### Differentiated Instruction

Remind students that the main idea of an article is its most important idea. Readers can use the supporting details in an article to find the main idea. Write a main idea on the board and have students write a paragraph about it that includes supporting details. Ask partners to exchange paragraphs, circle the main idea, and underline the supporting details.

### English Language Learners

Ask partners to take turns explaining something they know a lot about, such as the difference between two sports, and identifying the main ideas of the explanations. Have partners also identify the details that support each main idea.

### Graphic Organizers

Use Graphic Organizer 9 as a Main Idea-and-Details Chart. Ask students to write the following main idea in the box on the left and details that support it in the boxes on the right.

### Main Idea

Voodoo magic has a serious effect on the lives of people who believe in and practice it.
### Unit 1, Lesson 3

#### Phenomena

**“Mysteries of Easter Island,” pages 30–37**

<table>
<thead>
<tr>
<th><strong>Intro</strong></th>
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<tr>
<td><strong>Summary</strong></td>
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<tr>
<th><strong>BEFORE READING</strong></th>
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<tbody>
<tr>
<td><strong>Build Vocabulary</strong></td>
<td>List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the following sentence stems on the board. Read the sentence stems aloud and ask students to complete them.</td>
</tr>
<tr>
<td><strong>grim:</strong></td>
<td>bleak</td>
</tr>
<tr>
<td><strong>singular:</strong></td>
<td>remarkable</td>
</tr>
<tr>
<td><strong>forlorn:</strong></td>
<td>desolate</td>
</tr>
<tr>
<td><strong>massive:</strong></td>
<td>enormous</td>
</tr>
<tr>
<td><strong>prospered:</strong></td>
<td>flourished</td>
</tr>
</tbody>
</table>

1. The doctor had a **grim** expression because . . .
2. The tourists saw the **singular** view when they . . .
3. The **forlorn** people were not happy because . . .
4. The best place to see a **massive** building is . . .
5. We knew the garden had **prospered** because . . .

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<thead>
<tr>
<th><strong>Activate Prior Knowledge</strong></th>
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<tbody>
<tr>
<td><strong>1.</strong> Have students find Easter Island on a map.</td>
<td></td>
</tr>
<tr>
<td><strong>2.</strong> Ask students to describe statues they have seen either outside or in museums. Invite them to suggest where the statues were made, what they were made of, and how they were moved.</td>
<td></td>
</tr>
<tr>
<td><strong>3.</strong> Ask students who have visited or lived on islands to describe island life and how it might be different from life on the mainland.</td>
<td></td>
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</table>

| **Preview** | Ask students what clues the title of the article, the photographs, and the photo captions provide. What predictions about the article might students make? *(Possible answer: The article is about mysteries on Easter Island. The mysteries must revolve around the seven stone faces like the monumental heads called Ahu Akivi or Ahu Tahai.)* |

| **DURING READING** |  |
| **Determine Word Meanings from Context** | Think of context as the words or sentences that surround a word you don’t know. This information can help you make a good guess about what the word means. Have students look for clues such as descriptions, synonyms, or examples to help them figure out what difficult words mean. |

| **ENGLISH LANGUAGE LEARNERS** |  |
| **DIFFERENTIATED INSTRUCTION** | Ask students to bring in song lyrics or poems that contain words that may be unfamiliar to other students. Have students take turns explaining to the class how they determined the meaning of unfamiliar words using context clues. |
| **ENGLISH LANGUAGE LEARNERS** | Tell students that they sometimes can figure out the meaning of an unfamiliar word because descriptions are given in the text. Use the word **cannibalism** in paragraph 7 in the article as an example. Have students read the last three sentences and use the description to figure out what **cannibalism** means. *(the act of people eating other people)* |

| **GRAPHIC ORGANIZERS** | Use Graphic Organizer 2 as a Make Inferences Chart. Ask students to write the following details that experts knew about Easter Island in the first column. In the second column, have them write inferences the experts made. |
| **1. The islanders’ canoes were full of holes.** |  |
| **2. The statues were made in one place and brought to another.** |  |
| **3. Dolphins were a basic part of the first settlers’ diet.** |  |
| **Half-built statues were left among the rocks.** |  |

| **AFTER READING** | Have students write a journal or blog entry about their responses to the mysteries of Easter Island. Ask students: What do you think is the most interesting mystery about Easter Island? How would you have felt if you had landed on Easter Island with Roggeveen? Would you like to visit Easter Island today? Why or why not? |

**Build Background** Easter Island, which became part of Chile in 1888, was formed by volcanoes that rose from the ocean floor. Its triangular shape is a result of three extinct volcanoes that were joined by lava flows. The island has steep, ashy cliffs, and most of the beaches are gravel rather than sand. The island also has caves, many of which consist of rooms connected by tunnels that go deep into the lava beds. In 1995, when its monumental statues were deemed to have “outstanding universal value,” Easter Island was named a UNESCO World Heritage site to preserve and protect the statues. Today, tourists fly to the island to visit the statues, lava formations, beaches, and archeological sites. Such activity is the basis of the island’s economy. |
### Phenomena

"Black Holes," pages 38–45

<table>
<thead>
<tr>
<th><strong>Unit 1, Lesson 4</strong></th>
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<tbody>
<tr>
<td><strong>Introduce</strong></td>
</tr>
<tr>
<td><strong>Summary</strong> When a dying star collapses in on itself, its matter becomes so tightly packed that it measures no more than a mile across, and it drags every bit of matter in the area into it. The star becomes a black hole, a small, invisible area that is so dense and has such strong gravity that even light beams bend back toward its center and cannot escape. In fact, nothing can escape from a black hole. Scientists believe that there are at least five black holes in our part of the universe, but there is no way to know for sure. Scientists continue to investigate these invisible chunks of matter, but in the meantime, black holes remain a mystery.</td>
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<thead>
<tr>
<th><strong>BEFORE READING</strong></th>
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<tbody>
<tr>
<td><strong>Build Vocabulary</strong> List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the following questions on the board. Read the questions aloud and discuss the answers with students.</td>
</tr>
<tr>
<td><strong>bizarre:</strong> weird</td>
</tr>
<tr>
<td><strong>emitted:</strong> given out</td>
</tr>
<tr>
<td><strong>lethal:</strong> deadly</td>
</tr>
<tr>
<td><strong>hover:</strong> float</td>
</tr>
<tr>
<td><strong>emerge:</strong> come out</td>
</tr>
<tr>
<td>1. What word goes with “light that came from a flashlight”? (emitted)</td>
</tr>
<tr>
<td>2. What word goes with &quot;walk through an exit door”? (emerge)</td>
</tr>
<tr>
<td>3. What word goes with “very strange”? (bizarre)</td>
</tr>
<tr>
<td>4. What word goes with “helicopter or hummingbird”? (hover)</td>
</tr>
<tr>
<td>5. What word goes with “guns, knives, or other weapons”? (lethal)</td>
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<tr>
<th><strong>Activate Prior Knowledge</strong></th>
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<tbody>
<tr>
<td>1. Ask students to define matter (Possible answers: everything around you, everything made of atoms).</td>
</tr>
<tr>
<td>2. Use Graphic Organizer 3 as a KWL Chart. Have students label the first column <strong>Know</strong> and write what they know about black holes. Have students label the second column <strong>Want to Know</strong> and write what they want to know. This exercise will be continued after reading.</td>
</tr>
<tr>
<td>3. Ask students to discuss gravity and the expression “What goes up must come down.”</td>
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| **Preview** Ask students what clues the title of the article, the images, and the captions provide. What predictions about the article might students make? (Possible answer: The article will give information about black holes in outer space.) |

<table>
<thead>
<tr>
<th><strong>DURING READING</strong></th>
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<tr>
<td><strong>Ask Questions</strong> Questioning helps you to monitor your understanding of the text. Have students ask <strong>who</strong>, <strong>what</strong>, <strong>where</strong>, <strong>when</strong>, <strong>why</strong>, and <strong>how</strong> questions and look for the answers. Questions may include: What phenomenon is the article about? Who studies the phenomenon? Where is this phenomenon? When does it occur? Why does it occur? How does it occur?</td>
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<tr>
<th><strong>AFTER READING</strong></th>
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<tr>
<td><strong>Respond to the Article</strong> Have students write a journal or blog entry about their responses to black holes. Ask students: Why do you think the author says that black holes are the most bizarre objects in the universe? Based on information in this article, do you think people will ever be able to enter a black hole? Why or why not?</td>
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<tr>
<th><strong>DIFFERENTIATED INSTRUCTION</strong></th>
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<tr>
<td><strong>Support Individual Learners</strong> Have students keep a reading log to help them become better readers. Have them answer questions like the following for articles they read: Did anything in the text remind you of an experience you have had? Did you have a positive or negative reaction to anything in the text? With what parts of the text did you agree or disagree? Which part of the text, if any, was confusing to you?</td>
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<tr>
<th><strong>ENGLISH LANGUAGE LEARNERS</strong></th>
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<tr>
<td><strong>Assign proficient English-speaking partners to ELLs and ask the partners to help the ELLs form questions. Having ELLs actively question what they don’t understand will help them as they encounter difficult text in a new language.</strong></td>
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<tr>
<th><strong>GRAPHIC ORGANIZERS</strong></th>
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<tbody>
<tr>
<td><strong>Use Graphic Organizer 3 as a KWL Chart. Have students use the charts they started before reading the article. If students did not do this exercise before reading, they can start it now. Students should label the third column <strong>Learned</strong> and add any information they learned about black holes. Students may wish to add more questions to the <strong>Want to Know</strong> column. Encourage them to find answers to their questions online or at the library. Invite students to discuss their charts.</strong></td>
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</table>
**Unit 1, Lesson 5**

**Phenomena**

"Triangle of Fear," pages 46–53

<table>
<thead>
<tr>
<th>Introduction</th>
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<tr>
<td><strong>Summary</strong></td>
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<table>
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<tr>
<th>BEFORE READING</th>
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<tbody>
<tr>
<td><strong>Build Vocabulary</strong></td>
</tr>
</tbody>
</table>

| routine: regular | skeptics: doubters |
| infamous: having a bad reputation | farfetched: improbable |
| massive: immense | |

1. If you are doing a routine errand, you might be . . .  
2. An infamous basketball player is a player who . . .  
3. The town conducted a massive search of the area because . . .  
4. Many people believe this theory, but the skeptics . . .  
5. The parents listened to their child's farfetched explanation, but . . .

| Activate Prior Knowledge | |
|-------------------------| |
| 1. Have students find the southern coast of Florida, Fort Lauderdale, and Bermuda on a map.  
2. Ask students to discuss UFOs and the lost continent of Atlantis as causes of disappearing ships or planes.  
3. Ask students to brainstorm words they associate with the Bermuda Triangle. |

| Preview | Ask students what clues the title of the article, the images, and the captions provide. What predictions about the article might students make? (Possible answer: The article is about the fear associated with the Bermuda Triangle, an area in the Atlantic Ocean where planes and boats have mysteriously disappeared.) |

| Build Background | The Bermuda Triangle, or Devil’s Triangle, is the unofficial name given to an area in the North Atlantic Ocean where it is claimed, an unusually high number of planes and ships have mysteriously disappeared. The three points of the triangle are usually considered to be Bermuda; Miami, Florida; and San Juan, Puerto Rico. Although many people believe in its existence, the U.S. Navy does not. According to the Navy, thousands of ships and aircraft disappear all over the world for many reasons, including weather, navigational error, and piracy. When ships and aircraft disappear, there are often no witnesses, so the exact location or cause of the disappearance is unknown. In the Bermuda Triangle, there are some extremely deep underwater trenches, which can range from 19,000 to 27,000 feet. The sea floor is also home to shoals, reefs, and strong currents, all of which can not only cause accidents but also make it nearly impossible to find sunken planes or ships. |

| DURING READING | Determine Word Meanings from Context | Think of context as the words or sentences that surround a word you don’t know. This information can help you make a good guess about what the word means. Have students look for clues such as descriptions, synonyms, or examples to help them figure out what difficult words mean. |

| AFTER READING | Respond to the Article | Have students write a journal or blog entry about their responses to the disappearance of Flight 19. Ask students: What do you think happened to Flight 19? What details from the article support your opinion? How would you feel about traveling in the Bermuda Triangle? |

<table>
<thead>
<tr>
<th>DIFFERENTIATED INSTRUCTION</th>
<th>ENGLISH LANGUAGE LEARNERS</th>
<th>GRAPHIC ORGANIZERS</th>
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</thead>
<tbody>
<tr>
<td>Have students work in pairs to read a passage from a newspaper or magazine. Ask them to identify at least three unfamiliar words, use context clues to figure out the meanings, and discuss how the context clues helped them. Then have students check the meanings in a dictionary.</td>
<td>Tell students that they sometimes can use an appositive to figure out the meaning of a word. Point out that when commas surround a phrase, it often describes or defines a word. Use the word premonition in paragraph 4 in the article as an example. Have students read the phrase “an unexplainable feeling that something was going to go wrong” to figure out what premonition means.</td>
<td>Use Graphic Organizer 2 as a Classifying Chart. Have students label one column Believers in Mystery of Bermuda Triangle and the other Nonbelievers in Mystery of Bermuda Triangle. Then ask students to write four details from the article that support each belief.</td>
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</table>
**Unit 1, Lesson 6**

### Phenomena

"Spontaneous Human Combustion," pages 54–61

<table>
<thead>
<tr>
<th><strong>BEFORE READING</strong></th>
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<tbody>
<tr>
<td><strong>Build Vocabulary</strong></td>
<td>List the vocabulary words and their definitions on the board. Discuss each word's meaning with students. Then write the following questions on the board. Read the questions aloud and discuss the answers with students.</td>
</tr>
<tr>
<td>consumed: destroyed</td>
<td></td>
</tr>
<tr>
<td>spontaneous: natural</td>
<td></td>
</tr>
<tr>
<td>bristle: stand on end</td>
<td></td>
</tr>
<tr>
<td>ghastly: horrible</td>
<td></td>
</tr>
<tr>
<td>flammable: burnable</td>
<td></td>
</tr>
<tr>
<td>1. If you saw a building being consumed by flames, what would you do? Why?</td>
<td></td>
</tr>
<tr>
<td>2. If you had a spontaneous reaction to some news, did you plan ahead of time, or did you react without thinking?</td>
<td></td>
</tr>
<tr>
<td>3. What could make the hairs on your neck bristle? Why?</td>
<td></td>
</tr>
<tr>
<td>4. What do you think is a more ghastly discovery—finding human remains or wildflowers in the woods? Why?</td>
<td></td>
</tr>
<tr>
<td>5. Would it be a good or bad idea to light matches near a flammable liquid? Why?</td>
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| **Build Background** | While spontaneous human combustion remains a mystery, the act of cremating a human body in a funereal rite has been a well-known ritual for much of human history. In ancient Greece, soldiers slain during battle on foreign ground were cremated in an open fire so that their remains could be brought home for a proper funeral. The Vikings constructed funeral pyres on boats and then launched the burning boats out to sea. In India, the holy city of Varanasi is a site for many religious cremations, and in Bali, cremations are performed in highly decorated cremation towers. In the United States, cremations take place in a crematorium chamber, where intense heat transforms the human body into ashes. The first crematorium was built in Washington, Pennsylvania, in 1876. |

| **DURING READING** | Infer An inference is a logical guess about information that the writer suggests but doesn’t directly say. Making inferences helps readers find deeper meaning in what they read. Ask students to look for details that aren’t fully explained. Have them combine clues from the text with their personal knowledge to identify what the writer suggests. |

| **ENGLISH LANGUAGE LEARNERS** | Several picture books for older readers can be useful for helping students understand the concept of making inferences. Have students read the books in small groups and make three inferences about what happened in each book. The Arrival by Shaun Tan depicts the journey of a man who leaves home for a strange, fantastical land in order to support his family. |

| **GRAPHIC ORGANIZERS** | Use Graphic Organizer 8 as a Compare-and-Contrast Chart for two of the cases of spontaneous human combustion. Have students label one oval Billy Clifford’s Date, the other Mary Reeser, and the intersection Both. Have students write each detail below in the correct section of the diagram. |

<table>
<thead>
<tr>
<th><strong>Support Individual Learners</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Differentiated Instruction</strong></td>
<td>Collect passages, newspaper headlines, jokes, or cartoons that require students to make inferences in order to understand the text fully. Place students in groups and have them work together to make inferences based on the text. The dialogue among students builds background knowledge, and those who have difficulty with this skill can learn from those who are more adept at it. Allow groups to share their inferences with the class.</td>
</tr>
</tbody>
</table>

| **Summary** | When Billy Clifford’s date burst into flames in the 1950s, no one could explain the cause of the mysterious fire that consumed her body but nothing else around it. Nor could anyone explain the case of spontaneous human combustion, or SHC, that took the life of Mrs. Mary Reeser in 1951. Many theories have been suggested to explain SHC, but scientists reject them all because humans do not burst into flames for no reason. So for now, SHC remains another of life’s mysteries. |
Phenomena
“Moon Madness,” pages 62–69

Summary Throughout history, many people have believed that a full moon causes unusual behavior in both people and animals. During a full moon, some police and 911 operators report an increased number of calls, some nurses report more births, and some farmers plant crops. Many others, though, do not believe there is a proven relationship between the moon and these occurrences. To those scientists who believe in “biological tides,” others ask the question, “Where’s the proof?”

BEFORE READING
Build Vocabulary List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the sentences that contain the words on the board. Read the sentences aloud and discuss them with students.

| inspire: encourage |
| domestic: household |
| frequency: regularity |

1. Did the freshly baked cookies at the bakery inspire you to go home and bake your own?
2. The family works together to get the domestic chores done over the weekend.
3. There is a connection between the frequency of car accidents and the weather conditions.

Activate Prior Knowledge
1. Invite students to first describe a full moon and then to share stories or superstitions about the full moon.
2. Ask students to give facts about the moon. Go to http://www.nasa.gov/, enter “moon” in the search box, and click on the first result.
3. Discuss with students the concepts of gravity, the moon’s gravity, and how the moon’s gravity affects the tides. Go to http://nationalgeographic.com/, enter “moon facts” (with quotes) in the search box, and click on the second result.

Preview Ask students what clues the title of the article, the photographs, and the photo captions provide. What predictions about the article might students make? (Possible answer: I will learn beliefs about the powers of the full moon, such as whether crops grew better if planted during a full moon or if it can affect a person’s mood.)

DURING READING
Ask Questions Questioning helps you to monitor your understanding of the text. Have students ask who, what, where, when, why, and how questions and look for the answers. Questions may include: What phenomenon is discussed in the article? Who believes in it? Where does the phenomenon take place? When does it take place? Why do some people believe in it when others do not? How do the people support their opinions?

AFTER READING
Respond to the Article Have students write a journal or blog entry about their responses to the theories about how a full moon affects people’s behavior. Ask students: How do you feel when there is a full moon? Do you agree with scientists who think the moon affects people’s behaviors or scientists who think people are only more aware of what is happening during a full moon? Why?

DIFFERENTIATED INSTRUCTION Have students choose a newspaper article that interests them. Then have them pretend that they are the editor of the paper and want more information about the article. Have them write at least five questions they can ask the writer to gain the additional information.

ENGLISH LANGUAGE LEARNERS Have students choose a magazine article and study the pictures. Ask them to come up with three questions about the pictures that might be answered in the article. Then have partners read the article, including the headline and captions, to find the answers to their questions.

GRAPHIC ORGANIZERS Use Graphic Organizer 2 as a Question-and-Answer Chart. Ask students to write four questions they have about “Moon Madness” in the first column. Then have students exchange papers and answer the questions in the second column. Ask them to use details from the article and what they know from their own experiences to help them answer the questions.
**Phenomena**

**Sunspots: Solar Blemishes,” pages 76–83**

### Introduction

**Summary** Galileo first noticed sunspots, dark spots on the Sun’s surface, in the 16th century. Today, scientists are still studying sunspots to try to find out what effect they might have on Earth. Sunspot activity increases and reaches its peak, or solar maximum, about every 11 years before it begins to fade again and reach the solar minimum. This means that the amount of heat the Sun sends Earth is not constant. The variation in sunspots also seems to affect Earth’s weather, cause the northern lights, and interfere with radio waves, which disrupts radar.

### Before Reading

**Build Vocabulary** List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the following questions on the board. Read the questions aloud and discuss the answers with students.

<table>
<thead>
<tr>
<th>Blemishes: blotches</th>
<th>Immense plumes: huge jets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum: highest point</td>
<td>Stunning display: lovely exhibition</td>
</tr>
<tr>
<td>Predictable: expected and prepared for</td>
<td></td>
</tr>
</tbody>
</table>

1. Would you rather paint a wall with a smooth surface or with blemishes? Why?
2. If you got the maximum score on a test, did you do very well or very poorly? Why?
3. If your friend did something predictable, were you surprised, or were you expecting it? Why?
4. If immense plumes of fire are coming out of a burning building, are the flames large or small? Why?
5. What stunning display would you like to see? Why?

### Activate Prior Knowledge

1. Invite students to describe the Sun and to tell how it is important to life on Earth.
2. Ask students what they think a sunspot is. Invite them to discuss how scientists might learn more about sunspots on the Sun’s surface.

### Preview

Ask students what clues the title of the article, the images, and the captions provide. What predictions about the article might students make? (Possible answer: This article is about sunspots, dark spots on the Sun that have lower temperatures than the rest of the Sun’s surface. I think I will learn what the aurora borealis, or northern lights, has to do with sunspots.)

### During Reading

**Visualize** Visualizing is picturing in your mind the details of the setting, events, and characters in the text. Encourage students to draw pictures or diagrams of these images as they read.

**Differentiated Instruction**

Choose a descriptive poem and read it aloud to students. Have students visualize the poem. Then reread the poem and have students act out what they see in their mind’s eye. Finally, ask students to draw a sketch or write a description of their visualizations.

### English Language Learners

Have students take turns describing favorite places. As each student describes a place, have others visualize it. Encourage students to ask questions as needed to help them clarify their visualizations.

### After Reading

**Respond to the Article** Have students write a journal or blog entry about their responses to sunspots. Ask students: Which effect of sunspots do you think is the most serious? Why? What do you think Isaac Asimov meant when he said, “If the Sun were to as much as hiccup, life on Earth might be baked out, or frozen out”? How does the statement relate to sunspots?

**Graphic Organizers**

Use Graphic Organizer 1 as a Concept Map. Have students write How Sunspots Affect Earth in the center bubble. Then in the surrounding bubbles, ask students to write ways that sunspots might affect Earth.

---

**Build Background** Our Sun is nearly 4.6 billion years old and will probably last up to 5 billion years more. When it starts to die, it will first become a red giant and then a white dwarf before fading away into a black dwarf. The Sun, although 1,000 times smaller than the biggest stars, has a radius of about 432,000 miles, which is about 109 times bigger than Earth’s radius. In our solar system, the planets, their moons, thousands of asteroids, and trillions of comets orbit the Sun, which is only one of billions of stars in the Milky Way Galaxy. The Sun, which is 25,000 light-years from the center of the galaxy, revolves around the center one time every 250 million years. (One light-year is about 5.88 trillion miles.) The Sun’s magnetic field, which in some areas is almost 3,000 times as great as it is in other areas, causes dark sunspots and eruptions called flares and coronal mass ejections.

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### Phenomena
**“Can Some People See the Future?” pages 84–91**

**Summary** Before an American Airlines jet crashed in 1979, David Booth dreamed about it for 10 nights in a row. He even called the airline and federal officials to warn them. In 1485 Robert Nixon predicted his own death by starvation, and in the 17th century Kenneth MacKenzie, the “Brahan Seer,” foretold the future with astonishing clarity. Did these men really have a “sixth sense”? Could they see into the future? Some people believe that everyone has a “sixth sense” but that not everyone knows how to use it.

---

### BEFORE READING

**Build Vocabulary** List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the following questions on the board. Read the questions aloud and discuss the answers with students.

<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>outburst</td>
<td>sudden shout</td>
</tr>
<tr>
<td>lingered</td>
<td>remained</td>
</tr>
<tr>
<td>reassured</td>
<td>set someone’s mind at ease</td>
</tr>
<tr>
<td>livid</td>
<td>very angry</td>
</tr>
<tr>
<td>demise</td>
<td>destruction</td>
</tr>
</tbody>
</table>

**Activate Prior Knowledge**

1. Ask students to name times that they make predictions, or guesses about the future. Then invite discussion about the difference between making predictions and seeing the future.
2. Have students name the five senses. Then ask what they think the term *sixth sense* means.
3. Invite students to discuss the difference between dreams and nightmares. Ask if they ever have dreams about past or future events.

**Preview** Ask students what clues the title of the article, the images, and the captions provide. What predictions about the article might students make? *(Possible answer: This article raises the question about whether people can see the future. I think I will read predictions about an airplane crash and about King Henry VII.)*

---

### DURING READING

**Predict** Predicting is thinking ahead to guess how events might become resolved. Predicting helps readers become involved in the text. Readers base predictions on details in the text and their own knowledge. Tell students that their predictions may change as details change or are added.

---

### AFTER READING

**Respond to the Article** Have students write a journal or blog entry about their responses to the article. Ask students: What would you have done if David Booth had called to tell you about his dream? Would you want to have a “sixth sense”? Why or why not?

---

### DIFFERENTIATED INSTRUCTION

**Support Individual Learners**

Give students a comic strip with the final frame missing. Ask them to draw their prediction of what happens at the end. Remind them to use clues the author has provided. When they finish, give them the rest of the comic and have them compare their predictions to the ending.

---

### ENGLISH LANGUAGE LEARNERS

Have partners practice predicting the outcomes of stories. Students may read a story or tell the plot of a book or film. Have the storyteller stop periodically and ask, “What do you think happens next?” Ask the partner to make a prediction. Have students discuss whether their predictions were correct or if they had to revise them. Then ask students to switch roles.

---

### GRAPHIC ORGANIZERS

**Use Graphic Organizer 9 as a Main Idea-and-Details Chart.** Have students write the following main idea in the box on the left. Then have them write three details that support the main idea in the boxes on the right.

**Main Idea**

Some people seem to have a “sixth sense.”
### BEFORE READING

**Build Vocabulary**
List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the sentences that contain the words on the board. Read the sentences aloud and discuss them with students.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>severely subnormal</td>
<td>very retarded</td>
</tr>
<tr>
<td>superb</td>
<td>excellent</td>
</tr>
<tr>
<td>flair</td>
<td>talent</td>
</tr>
</tbody>
</table>

1. Some **severely subnormal** children go to schools where they can get specialized instruction.
2. Many people love this restaurant because they think the food is **superb**.
3. The young pianist has had a special **flair** for playing the piano since he was a small child.

### ACTIVATE PRIOR KNOWLEDGE

1. Ask students to discuss their talents and how they learned to excel at these talents.
2. Discuss the terms *IQ* and *photographic memory*. If necessary, help students research the terms either online or by using library reference sources.

### PREVIEW

Ask students what clues the title of the article, the drawings, and the captions provide. What predictions about the article might students make? (Possible answer: I think this article is about an autistic savant named Nadia, who could draw in detail a horse and rider when she was just five years old.)

### DURING READING

**Find Vocabulary in Context**
As students read the article, have them note the new vocabulary words. Ask them to think about each word’s meaning as they read.

**Respond to the Article**
Have students write a journal or blog entry about their responses to the unusual abilities of autistic savants. Ask students: How would you feel if you were Nadia’s mother? What might you have done to help her? What do you find most interesting about Nadia’s case?

### AFTER READING

**ENGLISH LANGUAGE LEARNERS**
Have students choose a short magazine or newspaper article. Help them write the main idea of each paragraph. Then ask students to use the main ideas to summarize the article.

**DIFFERENTIATED INSTRUCTION**
Explain that when students summarize a text, they determine the most important ideas and restate those ideas in their own words. Tell students that thinking about who, what, where, when, why, and how will help them summarize. Then ask students to summarize a movie or television show that they have seen or an experience they have had.

**GRAPHIC ORGANIZERS**
Use Graphic Organizer 7 as a Summary Chart. Ask students to write the main ideas of paragraphs 11, 12, and 13 in the top three boxes. Then have them use those main ideas to summarize the paragraphs. Ask students to write each summary in the bottom box.

---

Summary: At six years old, Nadia did not talk or respond to people, but her drawings were phenomenal for her age; she had been drawing them since she was three years old. Nadia was an autistic savant, or someone who has one highly developed skill but is deficient in others. Some autistic savants are gifted in music or mechanics, but the most common ability is calendar counting. No one knows for sure how autistic savants acquire their special abilities, but theories include photographic memory, practice, and lack of language skills.
**Unit 2, Lesson 11**

**Phenomena**

“Tsunamis: Killer Waves,” pages 100–107

<table>
<thead>
<tr>
<th>Introduce</th>
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<tr>
<td><strong>Summary</strong></td>
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<tr>
<th>BEFORE READING</th>
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</thead>
<tbody>
<tr>
<td><strong>Build Vocabulary</strong></td>
</tr>
</tbody>
</table>

- monitored: observed closely
- vast: immense
- mythical: imaginary

1. The teacher monitored the students because . . .
2. Because the dogs have vast amounts of energy, the dog owners . . .
3. Some mythical monsters that people claim to have seen are . . .

<table>
<thead>
<tr>
<th>Activate Prior Knowledge</th>
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</thead>
<tbody>
<tr>
<td>1. Ask students to share their knowledge of tsunamis. Have them discuss tsunamis that have occurred in recent years. Then ask how students think tsunamis might be different from other ocean waves. Record their responses to discuss after reading.</td>
</tr>
</tbody>
</table>
2. Ask students to find the following places on a world map: Hilo, Hawaii; Alexandria, Egypt; Krakatoa; Sumatra; Java; Indonesia; Japan; Philippines. Ask for similarities and differences in the locations. |

<table>
<thead>
<tr>
<th>Preview</th>
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<tbody>
<tr>
<td>Ask students what clues the title of the article, the images, and the captions provide. What predictions about the article might students make? (Possible answer: This article will be about tsunamis, or killer waves, that can result from volcanic eruptions or earthquakes. I will read about the massive destruction tsunamis can cause.)</td>
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</tbody>
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<thead>
<tr>
<th>DURING READING</th>
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<tbody>
<tr>
<td><strong>Cause and Effect</strong></td>
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<tr>
<th>AFTER READING</th>
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<tbody>
<tr>
<td><strong>Respond to the Article</strong></td>
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<thead>
<tr>
<th>DIFFERENTIATED INSTRUCTION</th>
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<tbody>
<tr>
<td>Ask students to watch a news report about something caused by an action, such as destruction caused by a storm or an injury caused by an accident. Ask students to rewrite the report using words such as because, as a result, since, consequently, therefore, and so to help show cause-and-effect relationships.</td>
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<table>
<thead>
<tr>
<th>ENGLISH LANGUAGE LEARNERS</th>
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</thead>
<tbody>
<tr>
<td>Ask students to tell a partner a common folktale or legend that has cause-and-effect relationships in it. Have them pause to discuss the causes and effects by asking and answering questions that ask why. Model by pausing to ask about cause-and-effect relationships as you tell a story or legend.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>GRAPHIC ORGANIZERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Graphic Organizer 6 as a Time Line. Ask students to write the following dates on the graphic organizer. Then have them write one important event in the history of tsunamis for each date.</td>
</tr>
</tbody>
</table>

- A.D. 365
- 1883
- 1896
- 1946
- 1992
- 1993
- 1994
Unit 2, Lesson 12

Phenomena
“Multiple Personalities,” pages 108–115

<table>
<thead>
<tr>
<th>Introduce</th>
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</thead>
<tbody>
<tr>
<td><strong>Summary</strong> Juanita Maxwell was charged for a murder that she did not remember committing. Wanda, Juanita’s other personality, however, told the whole story and admitted to the murder. Juanita was found “not guilty by reason of insanity” and was sent to a psychiatric hospital. Was this a trick? The judge believed that Juanita was a victim of her other personality, Wanda. Although rare, many experts believe that true multiple personalities do exist and that a person can develop a distinct personality as a result of trauma or shock that most often was suffered during childhood.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BEFORE READING</th>
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</thead>
<tbody>
<tr>
<td><strong>Build Vocabulary</strong> List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the sentences that contain the words on the board. Read the sentences aloud and discuss them with students.</td>
</tr>
</tbody>
</table>

| boisterous: loud and spirited |
| baffling: puzzling |
| brash: bold |

<table>
<thead>
<tr>
<th><strong>Activate Prior Knowledge</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Discuss the meaning of the word multiple. Then ask students what they think it means to have multiple personalities.</td>
</tr>
<tr>
<td>2. Explain that sometimes defendants are found “not guilty by reason of insanity.” Encourage discussion about what that means. Go to <a href="http://www.pbs.org/">http://www.pbs.org/</a>, enter “insanity defense faqs” (with quotes) in the search box, click on the first result, and click on the link “Insanity Defense FAQs.”</td>
</tr>
</tbody>
</table>

| **Preview** Ask students what clues the title of the article, the images, and the captions provide. What predictions about the article might students make? (Possible answer: I think I will learn about multiple personalities. In rare cases, one person has different personalities that have their own identities.) |

| **Build Background** Dissociative identity disorder, formerly known as multiple personality disorder, is a disease in which one person has two or more distinct personalities. Although each personality may be totally unaware of the others, usually there is a dominant personality and one or more subordinate personalities. The dominant personality often does not remember what happens when a subordinate personality is in control, but the subordinate personality is often aware of the dominant personality’s existence. The different personalities do not show similar character traits and often have different names, outlooks on life, temperaments, handwriting, and body language. Treatment includes working with the patient to integrate the different personalities into one, which means that the dominant personality not only needs to face the original trauma but also must become aware of the other personalities. |

<table>
<thead>
<tr>
<th><strong>DURING READING</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Predict</strong> Predicting is thinking ahead to guess how events might become resolved. Predicting helps readers become involved in the text. Readers base predictions on details in the text and their own knowledge. Tell students that their predictions may change as details change or are added.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Respond to the Article</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Have students write a journal or blog entry about their responses to Juanita’s multiple personalities. Ask students: How would you describe Juanita’s two personalities? If you were the judge, what would your verdict have been? Why?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>ENGLISH LANGUAGE LEARNERS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Have students read the book <em>It Looked Like Spilt Milk</em>, by Charles Shaw, or other short stories of their choice. Ask students to use Graphic Organizer 3 to make and record three predictions as they read. Remind them to include details from the story, what they know, and the predictions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>GRAPHIC ORGANIZERS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Graphic Organizer 2 as a Fact-and-Opinion Chart. Have them label one column Facts and the other Opinions. Then have them write each statement below in the correct column. Juanita was a maid at a hotel in Florida. Inez Kelly is dead. Juanita’s performance was a clever trick. Alan Klein asked Juanita questions at the trial. Juanita was not clever enough to trick the social worker.</td>
</tr>
</tbody>
</table>
## Phenomena

**“Secrets of the Bog People,”** pages 116–123

### BEFORE READING

#### Build Vocabulary

- **unnerving:** unsettling
- **compressed:** condensed
- **duress:** force

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. If you have an experience that is <strong>unnerving,</strong> how might it make you feel? Why?</td>
<td></td>
</tr>
<tr>
<td>2. If garbage is in <strong>compressed</strong> layers, what might have happened to it? Why?</td>
<td></td>
</tr>
<tr>
<td>3. When someone agrees under <strong>duress</strong> to do something, do they want to do it, or do they feel forced to do it? Why?</td>
<td></td>
</tr>
</tbody>
</table>

#### Activate Prior Knowledge

<table>
<thead>
<tr>
<th>Activity</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preview</td>
<td>Ask students what clues the title of the article, the photographs, and the photo captions provide. What predictions about the article might students make? (Possible answer: <em>I think this article is about the bog people who lived more than 2,000 years ago. The article will give information about these people, and I will learn why they are phenomena.</em>)</td>
</tr>
</tbody>
</table>

#### Build Background

- **Peat bogs** are found all over the world. The peat, which is partially decayed plant material, collects in swamps and marshes and forms layers. People cut and dry the peat and use it for fuel, fertilizer, and sometimes to produce electricity. In 1982 bodies were found in Windover Pond, a peat-bottomed pond in Florida. Unlike the preserved bodies found in the bogs in Europe, the bodies at Windover were skeletons, although many had well-preserved brains. These skeletons date back to around 6280 B.C. By studying artifacts found at this burial site, scientists know that the people lived in a hunter-gatherer-fisher society. In 1986 Windover was named a National Historic Landmark.

### DURING READING

#### Infer

An inference is a logical guess about information that the writer suggests but doesn’t directly say. Making inferences helps readers find deeper meaning in what they read. Ask students to look for details that aren’t fully explained. Have them combine clues from the text with their personal knowledge to identify what the writer suggests.

#### AFTER READING

**Respond to the Article**

Have students write a journal or blog entry about their responses to the discovery of the bog people. Ask students: What is the strangest fact you read about the bog people? Why? What is the most interesting fact you read? What question would you like answered?

### DIFFERENTIATED INSTRUCTION

**Support Individual Learners**

- Ask students to write riddles about animals, sports, classroom objects, or other subjects of interest. Have partners take turns reading and guessing the answers to their riddles. Encourage them to discuss how clues in the riddles and their previous knowledge helped them make inferences to solve the riddles.

**ENGLISH LANGUAGE LEARNERS**

Several picture books for older readers can be useful for helping students understand the concept of making inferences. One example is *Hey, Al,* by Arthur Yorinks, which tells of a janitor named Al who meets a bird that tells him it has a solution to all of his problems. Have students read the books in small groups and make three inferences about what happened in each book.

**GRAPHIC ORGANIZERS**

Use Graphic Organizer 7 as an Inference Chart. Remind students that scientists made inferences from what they knew to come up with the two theories about the bog people shown below. Ask students to choose the inference they agree with and write it in the bottom box. Ask them to write details that support that inference in the top boxes.

**Inferences**

1. The bog people were killed as sacrifices to the gods.
2. The bog people were criminals.
Phenomena
“Killers in Pajamas,” pages 124–131

**Summary** According to experts, if a person suffers from sleepwalking or has REM sleep disorder, he or she can unknowingly commit murder while asleep. Ken Parks was sleepwalking when he committed murder. While in his deepest sleep, one part of his brain woke up and sent bizarre messages that the rest of his brain was not alert enough to counteract. A Kentucky girl shot her family as a result of REM sleep disorder. During REM sleep, her motor functions were not paralyzed, as is normally the case, so she could react to a dream about burglars trying to kill her family. Both Ken Parks and the girl from Kentucky were cleared of all charges using the “sleeping defense.”

**BEFORE READING**

**Build Vocabulary** List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the following questions on the board. Read the questions aloud and discuss the answers with students.

<table>
<thead>
<tr>
<th>murmuring: mumbling</th>
<th>befuddled: confused</th>
</tr>
</thead>
<tbody>
<tr>
<td>roused: awoke</td>
<td>paralyzed: deadened</td>
</tr>
<tr>
<td>counteract: override</td>
<td></td>
</tr>
</tbody>
</table>

1. Which word goes with “speaking softly”? (murmuring)
2. Which word goes with “unable to move your legs”? (paralyzed)
3. Which word goes with “laws that change previous laws”? (counteract)
4. Which word goes with “alarm clock”? (roused)
5. Which word goes with “puzzled or baffled”? (befuddled)

**Activate Prior Knowledge**

1. Ask students to discuss sleepwalking. Have them share sleepwalking experiences they have had or stories they have heard about.
2. Have students discuss other sleep disorders, such as snoring, sleep apnea, or insomnia. For more information, see http://www.sleepeducation.com/Disorders.aspx.

**Preview** Ask students what clues the title of the article, the images, and the captions provide. What predictions about the article might students make? (Possible answer: The article will be about sleep disorders, brain waves, and REM activity in sleeping people and how scientists study them.)

**Build Background** There are five stages of sleep. During Stage 1—drowsiness—people drift in and out of sleep and can be woken easily. In Stage 2—light sleep—eye movement stops, and brain waves slow down. Stages 3 and 4 are deep sleep and slow-wave deep sleep, respectively. In these stages, brain waves are extremely slow, there is no eye movement or muscle activity, and it is very hard to wake the sleeper. This is when sleepwalking occurs. During Stage 5—rapid eye movement (REM) —breathing is faster, limb muscles are temporarily paralyzed, and the heart rate increases. People who are woken up in the REM stage report strange dreams. About 50 percent of sleep is in Stage 2, 20 percent in REM, and the rest in the other stages. People cycle through these stages every night, with each cycle lasting from 90 to 100 minutes.

**DURING READING**

**Ask Questions** Questioning helps you to monitor your understanding of the text. Have students ask who, what, where, when, why, and how questions and look for the answers. Questions may include: What phenomenon is discussed in the article? Who suffered from it? Where did a crime take place? When did it take place? How do people explain this phenomenon?

**AFTER READING**

**Respond to the Article** Have students write a journal or blog entry about their responses to the “sleeping defense.” Ask students: How would you have reacted to the verdicts of Ken Parks, the husband who killed his wife, and the girl who shot her family? Why? How do you think people who sleepwalk or have REM disorder might be prevented from committing crimes?

**DIFFERENTIATED INSTRUCTION**

Have partners work together to summarize books, movies, or video games and to ask questions about them. First have one partner summarize and the other ask questions to find out more information. Then have the partners switch roles.

**ENGLISH LANGUAGE LEARNERS**

Have partners play a question game. Tell one partner to think of a fictional character or a well-known person from the news. Have the other partner ask what, where, when, why, and how questions to guess who the person is. Then have partners switch roles.

**GRAPHIC ORGANIZERS**

Use Graphic Organizer 4 as a Cause-and-Effect Chart. Have students write the following causes in the boxes on the left. Then have students write an effect for each cause in the boxes on the right.

**Causes**

A small part of the brain wakes and directs body movement.

There is no paralysis during REM sleep.

Ken Parks was asleep during the attack.

A person with sleep apnea stops breathing.
## Phenomena

"Firewalking: Mind Over Matter," pages 138–145

### Introduce

**Summary** Throughout Asia, people test their faith each year by successfully walking across flaming coals. How do these fire walkers cross the hot coals without being burned? True believers say the gods protect them. Scientists have looked for explanations supported by physics; however, of the several theories that have been put forth, none has been proven true. Some researchers believe that this phenomenon cannot be explained by physics but is rather an example of mind over matter.

### BEFORE READING

**DURING READING**

**Find Vocabulary in Context** As students read the article, have them note the new vocabulary words. Ask them to think about each word's meaning as they read.

**ENGLISH LANGUAGE LEARNERS**

Display restaurant or movie reviews that use a star-rating system. Explain that the number of stars expresses the author's viewpoint without using words. Ask students to make up other symbols that could express a viewpoint. Then have students use their symbols to express viewpoints about movies, books, current events, or other topics.

**GRAPHIC ORGANIZERS**

Use Graphic Organizer 7 as an Author's Viewpoint Chart. Ask students to write the following viewpoint in the bottom box. In each of the top boxes, have them write information from the article that supports the author’s viewpoint.

<table>
<thead>
<tr>
<th>Vocabulary</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>mishap: an accident</td>
<td></td>
</tr>
<tr>
<td>anguish: distress</td>
<td></td>
</tr>
<tr>
<td>dismayed: confused and upset</td>
<td></td>
</tr>
<tr>
<td>swayed: influenced by</td>
<td></td>
</tr>
<tr>
<td>tolerate: endure</td>
<td></td>
</tr>
</tbody>
</table>

| 1. We had a mishap while hiking in the woods when . . . |
| 2. The basketball player hobbled off the court in anguish because . . . |
| 3. The fans watching the championship game were dismayed when . . . |
| 4. The voters were not swayed by . . . |
| 5. People who can tolerate the hot sun might enjoy . . . |

**Build Background** Experts have different theories about why fire walkers can step on fire without getting burned. One expert suggests that it has to do with wood and coals being bad conductors of heat. In fire walking, heat is transmitted by conduction, the process of one substance transferring heat to another by direct contact. Since both coals and human feet are poor conductors, and since there is only brief contact between them during fire walking, there is not enough time for the coals to burn the feet. Another expert believes that circulating blood keeps the flesh on the feet from getting to their burning point. If a fire walker has a strong blood flow and keeps walking, the feet will not get burned. Both experts agree that having a positive state of mind helps.

**Preview** Ask students what clues the title of the article, the photographs, and the photo captions provide. What predictions about the article might students make? (Possible answer: The article is about fire walking, a major religious event in many parts of the world. I think I will learn that when people walk on fire, they use mind over matter.)

**Activate Prior Knowledge**

1. Ask students to discuss fire walking. Ask what they think happens to the feet of fire walkers.
2. Have students discuss the expression mind over matter. Ask: What does the expression mean? Describe situations in which you believe mind over matter helps you accomplish goals.

**Support Individual Learners**

Explain that an author's viewpoint is what the author thinks or believes about a topic. To determine the author's viewpoint, students should read carefully to look for clues that support the viewpoint. Then have students examine several political cartoons and discuss the authors’ viewpoints.

**ENGLISH LANGUAGE LEARNERS**

After reading, have students write a journal or blog entry about their responses to fire walking. Ask students: Why do you think people who walk on fire usually do not get burned? Why do you think the 10 fire walkers in India did get burned? Would you like to try to learn how to walk on hot coals? Why or why not?

**After Reading**

**Respond to the Article**

**ENGLISH LANGUAGE LEARNERS**

Display restaurant or movie reviews that use a star-rating system. Explain that the number of stars expresses the author's viewpoint without using words. Ask students to make up other symbols that could express a viewpoint. Then have students use their symbols to express viewpoints about movies, books, current events, or other topics.

**GRAPHIC ORGANIZERS**

Use Graphic Organizer 7 as an Author’s Viewpoint Chart. Ask students to write the following viewpoint in the bottom box. In each of the top boxes, have them write information from the article that supports the author’s viewpoint.

The best explanation for how fire walkers succeed is mind over matter.
### 준비하기 (BEFORE READING)

**Build Vocabulary** List the vocabulary words and their definitions on the board. Discuss each word's meaning with students. Then write the following questions on the board. Read the questions aloud and discuss them with students.

- **lumbering:** stepping clumsily
- **perished:** died out
- **intact:** whole

1. Which word goes with “extinct animals”? (perished)
2. Which word goes with “complete or in one piece”? (intact)
3. Which word goes with “pursued for prey”? (stalked)

**Activate Prior Knowledge**

1. Use Graphic Organizer 3 as a KWL Chart. Have students label the first column *Know* and write what they know about woolly mammoths. Have students label the second column *Want to Know* and write what they want to know. This exercise will be continued after reading.
2. Ask students to share what they know about cave people and cave paintings.
3. Have students find Siberia and other Arctic regions on a map. Ask students what they can infer about Siberia from looking at the map.

**Preview**

Ask students what clues the title of the article, the images, and the captions provide. What predictions about the article might students make? (Possible answer: The article is about mammoths that lived around 10,000 years ago. The frozen body of a baby mammoth was found in Siberia in 1977, and paintings of mammoths have been found in caves.)

### 동안 읽기 (DURING READING)

**Identify Sequence** Sequence is the order in which events, ideas, or things are arranged. Time order refers to the order in which events occur. Following the sequence of events helps you see how the text is organized and how events relate to each other. As students read, ask them to look for key words such as now, then, soon, at first, today, as, and long after.

### 납관하기 (AFTER READING)

**Respond to the Article** Have students write a journal or blog entry about their responses to the article about woolly mammoths. Ask students: Why do you think learning why woolly mammoths died 10,000 years ago is important to scientists today? What is your theory about the mystery of the woolly mammoths?

### 개인 사례 지원 (Support Individual Learners)

**Differentiated Instruction** Have students place photographs or magazine pictures in sequence and explain why they chose to order the pictures in time order, in spatial order, in order of importance, or as steps in a process. They could also use objects to create spatial-order sequences, such as arranging pens, paper clips, and books on a desk, and use signal words to describe the order.

**English Language Learners**

Cut apart panels of comic strips and ask students to place the frames in sequence. Have them explain to partners why they used the order they did. Encourage them to use key words such as first, next, then, and last or finally.

**Graphic Organizers**

Use Graphic Organizer 3 as a KWL Chart. Have students use the charts they started before reading the article. If students did not do this exercise before reading, they can start it now. Students should label the third column *Learned* and add any information they learned about woolly mammoths. Students may wish to add more questions to the *Want to Know* column. Encourage them to find answers to their questions online or at the library. Invite students to discuss their charts.

---

**Summary** Woolly mammoths roamed in the Arctic regions up until 10,000 years ago, when they became extinct. In 1800 a frozen woolly mammoth carcass was uncovered. After that, 39 more frozen mammoths were found, some in upright positions with food still in their stomachs. As a result, some researchers believed that the mammoths had died very quickly from climate change. Today many experts think that a climate change might have affected the mammoths but that for the most part, early cave people killed them off by hunting them. These experts think that the rare frozen mammoths died from freak accidents.
**Phenomena**

"Can Animals Predict Earthquakes?" pages 154–161

<table>
<thead>
<tr>
<th>Introduce</th>
<th><strong>TEACH LESSON SKILLS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summary</strong></td>
<td>For hundreds of years, animals have been exhibiting strange behaviors before earthquakes. While many Asian people have believed it was because animals could sense the earthquakes before they struck, it wasn’t until more recent years that Western experts have begun to study this phenomenon. Some scientists believe that animals detect low-frequency sounds from early shocks. Others think that animals can feel vibrations in the earth, and still others believe that animals smell gases that are released or sense electricity when the earth releases ions.</td>
</tr>
</tbody>
</table>

| **BEFORE READING** |
| **Build Vocabulary** | List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the sentences that contain the words on the board. Read the sentences aloud and discuss them with students. |
| **Immensa**: huge | **Alien**: strange |
| **Minute**: very small | **Scoff at**: mock |
| **Severed**: cut | |
| 1. There was an immense traffic jam on the highway after the multi-car accident. | |
| 2. The minute movement was so tiny that no one even noticed it. | |
| 3. During the windstorm, the telephone wires were severed and fell across the road. | |
| 4. The smells from cooking with exotic spices were alien to me. | |
| 5. Inventors are probably used to having people scoff at their ideas until they are proven useful. | |

| **Activate Prior Knowledge** |
| 1. Ask students when and how pets or other animals warn people of things that are about to happen. Have them discuss why animals might be aware of these things before people. |

| **Preview** |
| Ask students what clues the title of the article, the photographs, and the photo captions provide. What predictions about the article might students make? (Possible answer: The article is about how animals’ behavior changes before an earthquake. I think it suggests that scientists use both changes in animal behavior and seismographs to predict earthquakes.) |

| **BUILD BACKGROUND** |
| Earthquakes release seismic waves that radiate in all directions. Different types of waves travel in different ways and at different speeds. P waves, or primary waves, and S waves, or secondary waves, travel through the body of the earth. P waves are faster than S waves and reach the surface first, but S waves are stronger and make the ground shake up and down and back and forth. According to a study in 2000, P waves are probably responsible for animals sensing that an earthquake is coming because animals can feel and hear the P waves, which most people can’t. Because animals act to protect themselves, they respond to the P waves by behaving in uncharacteristic ways. If there are other earthquake signals that animals can sense, scientists don’t yet know about them. |

| **DURING READING** |
| **Visualize** | Visualizing is picturing in your mind the details of the setting, events, and characters in the text. Encourage students to draw pictures or diagrams of these images as they read. |

| **DIFFERENTIATED INSTRUCTION** |
| Have students choose descriptive paragraphs from stories they have read. Have partners work together to practice visualizing. Partners take turns reading their paragraphs and visualizing the details. Ask students to draw pictures to show their visualizations. |

| **ENGLISH LANGUAGE LEARNERS** |
| Have students choose pictures from books or magazines. As each student describes a picture (without showing it), have others visualize it and then draw pictures or write about the description they heard. When students have finished drawing, invite them to compare their pictures to the original. |

| **GRAPHIC ORGANIZERS** |
| Use Graphic Organizer 1 as a Visualizing Map. Have students write Animal Behavior Before Earthquakes in the center bubble. Then in each outer bubble, ask them to write a description from the article that helped them visualize they ways animals “predict” earthquakes. |
### Phenomena

**“A Cold Killer,” pages 162–169**

**Summary** In December 1990 three-year-old Brittany Eichelberger wandered outside into the frigid cold wearing only her underwear. By the time she was found, she was hypothermic, or had low body temperature. Her body, which had dropped to a temperature of 74°F, was frozen solid. When rescue workers found Brittany, they began CPR. Hospital workers heated her body with heat lamps, flushed her stomach with warm water, and pumped heated oxygen into her lungs. Brittany was lucky. She not only survived but made a complete recovery.

### BEFORE READING

**Build Vocabulary** List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the following sentence stems on the board. Read the sentence stems aloud and ask students to complete them.

- **personnel**: staff
- **adequate**: satisfactory
- **disoriented**: confused

1. _Personnel_ who work at a bank might include . . .
2. Fifty degrees is not an _adequate_ temperature for a home because . . .
3. The hikers became _disoriented_ when . . .

**Activate Prior Knowledge**

1. Have students brainstorm words that relate to hypothermia. Record their responses on Graphic Organizer 1. (Possible answers: freezing cold, low body temperature, shiver, death)
2. Have students share what they know about CPR (cardiopulmonary resuscitation).
3. Ask students to discuss personnel who work in emergency situations. (Possible answers: rescue workers, ambulance workers, paramedics, doctors, nurses, X-ray technicians)

**Preview** Ask students what clues the title of the article, the photographs, and the photo captions provide. What predictions about the article might students make? (Possible answer: The article is about the dangers of hypothermia and what happened to Brittany Eichelberger after she wandered out into subfreezing weather.)

### DURING READING

**Identify Sequence** Sequence is the order in which events, ideas, or things are arranged. Time order refers to the order in which events occur. Following the sequence of events helps you see how the text is organized and how events relate to each other. As students read, ask them to look for key words such as _at that moment, first, when, at/from that point, as, while, and after._

**ENGLISH LANGUAGE LEARNERS** Have students make a list of activities they would like to do over a weekend. Ask them to sequence the events in order of importance. Then have students share their lists and discuss the sequence of events.

**DIFFERENTIATED INSTRUCTION** Have students write the steps for a process, game, or activity that they know how to do. Remind them to use key sequence words as they write the steps in order. Then ask students to cut apart the steps. Have partners rearrange the steps in the correct sequence.

**GRAPHIC ORGANIZERS** Use Graphic Organizer 4 as a Cause-and-Effect Chart. In the boxes on the left, have students write the following causes of hypothermia. In the boxes on the right, have them tell what effect each cause has on the body. Discuss students’ responses.

**Causes**
- Body temperature starts to drop.
- Body temperature drops to 95°F.
- Body temperature drops to 86°F.
- Body temperature drops to 77°F.

**AFTER READING** **Respond to the Article** Have students write a journal or blog entry about their responses to Brittany’s hypothermia. Ask students: Why do you think Brittany survived after being outside in 20°F weather for so long? Why do you think her story is in a book called _Phenomena_? What lessons can you learn from this article?
Phenomena
“What Happened in Tunguska?” pages 170–177

Summary On June 30, 1908, the sky in Tunguska split in two and appeared to be covered with fire. The explosion that followed caused a horse to fall to its knees, hot winds to blow from the north, and a family to be tossed into the air. Shock waves circled the globe twice, and an area 62 miles wide was devastated. One researcher, Leonid Kulik, thought a meteorite had struck Earth; however, there was no crater. Similar to an explosion caused by an atomic bomb, this explosion had occurred in the air, left a mushroom-shaped cloud, and scorched the land below it. Perhaps, as Carl Sagan thought, a comet had exploded in air, but we may never know for sure.

BEFORE READING
Build Vocabulary List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the following questions on the board. Read the questions aloud and discuss the answers with students.

uninhabited region: unpopulated area
devastation: destruction
casualties: dead and injured
parallels: similarities
wasteland: barren land

1. Would you rather live in an uninhabited region or an area with a large population? Why?
2. If there is a large earthquake, are there likely to be some casualties? Why?
3. Are crops more likely to grow on land that is rich and lush or in a wasteland? Why?
4. Which do you think would cause more devastation—a hurricane or a forest fire? Why?
5. Are parallels ways in which events are alike or different? Why?

Activate Prior Knowledge
1. Ask students what causes bright lights in the sky. (possible answers: stars, moon, meteors/shooting stars, comets, airplanes)
2. Have students share their knowledge of the atomic bomb. Ask if there were nuclear bombs in the early 1900s (no) and when the first nuclear bombs were exploded. (1945) Go to http://www.pbs.org/, enter “first atomic bomb 1945” in the search box, and click on the first result.
3. Have students find Siberia and the Tunguska River basin on a map.

Preview Ask students what clues the title of the article, the photographs, and the photo captions provide. What predictions about the article might students make? (Possible answer: I think this article will answer the question in the title, “What Happened at Tunguska?” Scientists think a meteorite or piece of a comet caused a blast that scorched and uprooted trees.)

DURING READING
Cause and Effect A cause is an event or action that makes something else happen. An effect is the result or the outcome of that action. Writers use clue words such as because, so, since, if, and therefore to signal cause and effect. Have students look for cause-and-effect relationships by asking: What happened? Why?

AFTER READING
Respond to the Article Have students write a journal or blog entry stating their opinions about what happened in Tunguska. Ask students: What do you think happened in Tunguska? What details from the article support your opinion? Where else could you look to find information to support your opinion?

DIFFERENTIATED INSTRUCTION
Have students write a few paragraphs about personal experiences that have had cause-and-effect relationships. Ask them to include at least three experiences with cause-and-effect relationships. Suggest students use clue words to signal at least one of them. Then ask students to exchange and read each other’s paragraphs. Have them identify and discuss the cause-and-effect relationships.

ENGLISH LANGUAGE LEARNERS
Have students work with partners to name causes and effects. Model by saying a cause, such as “Mud splashed all over my car.” Ask a volunteer to give an effect for that cause: “I washed my car.” Then have partners take turns naming causes and possible effects of those causes.

GRAPHIC ORGANIZERS
Use Graphic Organizer 9 as a Cause-and-Effect Chart. Remind students that one cause can have many effects. Then ask students to write the cause below in the box on the left. Then have students write three effects of that cause. Discuss their responses.

There was an explosion in the Tunguska River basin that was heard 744 miles away.
### BEFORE READING

#### Build Vocabulary
List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the following questions on the board. Read the questions aloud and discuss the answers with students.

<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>trance</td>
<td>dreamlike state</td>
</tr>
<tr>
<td>enthusiasts</td>
<td>supporters</td>
</tr>
<tr>
<td>repose</td>
<td>peacefulness</td>
</tr>
<tr>
<td>minimize</td>
<td>greatly lessen</td>
</tr>
<tr>
<td>traumatized</td>
<td>harmed</td>
</tr>
</tbody>
</table>

1. What word goes with “in shock”? (traumatized)
2. What word goes with “relaxation”? (repose)
3. What word goes with “daydream”? (trance)
4. What word goes with “reduce”? (minimize)
5. What word goes with “fans or admirers”? (enthusiasts)

#### Activate Prior Knowledge
1. Ask students to discuss ways that people try to stop smoking or break some other bad habits.
2. Have students discuss reasons that people might choose to undergo hypnosis. Ask them to share experiences they have had, read about, or seen in movies, in performances, or on television.
3. Ask students what a suppressed memory is. (a lost or forgotten memory, often due to trauma or stress) Invite discussion about how hypnosis might help people with suppressed memories.

#### Preview
Ask students what clues the title of the article, the photographs, and the photo captions provide. What predictions about the article might students make? (Possible answer: I think the article is about hypnosis, which can help people change behaviors, overcome fears, and stop smoking.)

### DURING READING

#### Infer
An inference is a logical guess about information that the writer suggests but doesn’t directly say. Making inferences helps readers find deeper meaning in what they read. Ask students to look for details that aren’t fully explained. Have them combine clues from the text with their personal knowledge to identify what the writer suggests.

#### AFTER READING

#### Respond to the Article
Have students write a journal or blog entry about their responses to the explanations and benefits of hypnosis. Ask students: How did the comparison of hypnosis to going to the movies help you visualize and understand hypnosis? What is your opinion of hypnosis? Would you be willing to be hypnotized? Why or why not?

### DIFFERENTIATED INSTRUCTION
Have students use Graphic Organizer 3 to help them make inferences as they read a text. Ask them to choose a passage that interests them from a newspaper or a magazine. Tell students to write clues from the text in the first column, what they already know in the second column, and their inferences in the third column.

### ENGLISH LANGUAGE LEARNERS
Have students make inferences based on their observations. Ask them to describe something they noticed on the way to school, for example, and make inferences based on what they saw. You might also suggest that they make inferences based on things they notice in the classroom, around the school, or in newspaper or magazine photos.

### GRAPHIC ORGANIZERS
Use Graphic Organizer 1 as a Concept Map. Have students write How Hypnosis Has Helped in the center bubble. In each outer bubble, have them write one way in which hypnosis has helped people.
Phenomena
“Killer Bugs,” pages 186–193

**Summary**
The Group A streptococcus bacterium is not usually a killer, but there is a strain of it, necrotizing fasciitis, that can be deadly. The lethal strain starts in the tissue between the skin and the muscle and then attacks organs throughout the body. It often enters through a small cut and frequently strikes people recovering from surgery. This deadly bacterium has been around for centuries, is not contagious, and is not very common.

**BEFORE READING**

**Build Vocabulary**
List the vocabulary words and their definitions on the board. Discuss each word’s meaning with students. Then write the sentences that contain the words on the board. Read the sentences aloud and discuss them with students.

**gruesome:** ghastly
**scourge:** affliction
**exceedingly:** extremely

**lurid:** sensational
**virulent:** deadly

1. A young child should not see the gruesome scenes in the horror film.
2. Some people think the disease is a new scourge, but it has been around for years.
3. Not many people suffer from the disease because it is exceedingly rare.

**Activate Prior Knowledge**

1. Ask students to discuss Jim Henson and the Muppets. Have them share childhood experiences they had involving the Muppets. Ask them to name their favorite Muppet characters.
2. Ask students how people treat bad infections.

**Preview**
Ask students what clues the title of the article, the images, and the captions provide. What predictions about the article might students make? (Possible answer: This article is about a flesh-eating bacteria called Group A streptococcus, which can be deadly.)

**Build Background**
The killer bug, a strain of group A streptococcus, may date back to the time of Hippocrates. Hippocrates, who lived from ca. 460 to 375 B.C., was a well-loved physician on the Greek island of Cos. Although he is quite famous today, that fame began hundreds of years after his death, when medical works that were attributed to him, but not necessarily written by him, were made public in the Library of Alexandria around 200 B.C. Over time, Hippocrates became known as the father of medicine, and while the Hippocratic Oath, which calls for a new physician to adhere to certain professional ethical standards, is often attributed to Hippocrates, there is no proof that he wrote it. Doctors practicing Hippocratic medicine, unlike those believing in magic and witchcraft, believed that diseases had natural causes that could be studied and then cured.

**DURING READING**

**Predict**
Predicting is thinking ahead to guess how events might become resolved. Predicting helps readers become involved in the text. Readers base predictions on details in the text and their own knowledge. Tell students that their predictions may change as details change or are added.

**AFTER READING**

**Respond to the Article**
Have students write a journal or blog entry about their responses to the killer bug. Ask students: Why do you think the British newspapers splashed headlines about the killer bug? Do you think the headlines helped or hurt efforts to educate people about the bacteria? How can you protect yourself from this killer bug?

**DIFFERENTIATED INSTRUCTION**

**ENGLISH LANGUAGE LEARNERS**
Have students read the book Tiger Called Thomas by Charlotte Zolotow or another story of their choice. Ask students to draw a three-column chart in their notes and make and record three predictions as they read.

**GRAPHIC ORGANIZERS**
Use Graphic Organizer 2 as a Fact-and-Opinion Chart. Have students label one column **Facts** and the other **Opinions**. Ask them to write at least three facts and three opinions about the killer bug.
Phenomena

Unit 1 Assessment Article

Directions: Read this article. Then answer each question that follows. Circle the letter of your answer.

Mysterious Rocks

Death Valley lies in southeastern California and a small area of Nevada. In one spot in Death Valley, the temperature once rose to 134°F Fahrenheit, breaking the world’s record at the time. Death Valley includes the lowest land in the Western Hemisphere, 282 feet below sea level. It is also the driest place in North America and home to another extreme phenomenon—rocks that move!

2 The moving rocks are found in a flat, remote area of Death Valley National Park known as the Racetrack, or Racetrack Playa. (Playa is the name for a dry lakebed.) The Racetrack lies between mountains. When rain falls heavily, water flows down the mountain slopes. The Racetrack is briefly covered with shallow water, but under the hot sun, its surface quickly changes back into dry, cracked clay.

3 Rocky formations lie nearby. Rocks break off and come to rest on the flat surface of the Racetrack. After that, something mysterious happens. The rocks move. Each sliding rock leaves behind a trail of furrowed earth, showing its path. Some rocks move in a straight line, and others take curving routes. The rocks are of different sizes and include large ones weighing hundreds of pounds. According to the laws of physics, nothing can move unless a force acts on it. So what force could be pushing rocks across a level surface over distances as long as half a mile?

4 Scientists have been trying to figure out that answer for a long time. They have dismissed theories of animals or earthquakes as movers. Gravity can’t be at work, because the Racetrack is flat. Actually, the land rises just a couple of inches over its three-mile length, and most of the rocks move toward the rise. Researchers have also checked for magnetic fields and radiation and have found nothing unusual.

5 Many scientists believe that the wind plays a role. Wind can reach high speeds over the Racetrack, but not high enough to move boulders. There would have to be other forces at work, too, to reduce friction and allow things to move more easily. Perhaps the wind blows the rocks when the surface is slick from recent rainfall. One recent theory is that ice forming on and below the rocks helps them glide across the land when the wind blows hard. Another idea is that bacteria cling to the rocks when there is moisture, creating a slippery film. Measurements of moisture, temperature, and wind patterns provide clues for scientific study.

6 Why has it been so hard to figure out the cause of these mysterious movements? Well, the rocks don’t move all the time, just occasionally . . . and secretly. Nobody has ever actually seen the rocks in action!
Phenomena

Unit 1 Assessment Questions

1. Which sentence states the main idea best?
   a. The Racetrack is a mysterious rocky area in Death Valley.
   b. Death Valley is a place of mystery.
   c. Rocks move in an area of Death Valley, and scientists don’t fully understand why.

2. What is the Racetrack?
   a. a dry lake bottom
   b. a deep valley
   c. the hottest place in North America

3. Which answer is probably true?
   a. The rocks only seem to be moving.
   b. The rocks have unusual qualities.
   c. The clay surface is slippery at times.

4. What is the meaning of the underlined word?
   There would have to be other forces at work, too, to reduce friction and allow things to move easily.
   a. physics
   b. a force that slows movement
   c. moisture left by an object

5. The purpose of paragraph 4 is to
   a. describe how the rocks move.
   b. explain likely causes.
   c. tell about reasons that are not correct.

6. Which answer correctly restates this sentence from the article?
   Measurements of moisture, temperature, and wind patterns provide clues for scientific study.
   a. By measuring moisture, temperature, and wind patterns, scientists provide studies of clues.
   b. Moisture, temperature, and wind patterns are measurements that provide scientists with clues.
   c. Scientists measure moisture, temperature, and wind patterns and study what they find.

7. What is true of the rocks’ motion?
   a. They roll.
   b. They fall.
   c. They slide.

8. What probably happens when rain soaks the Racetrack?
   a. The rocks’ trails disappear.
   b. A deep lake forms in the bed.
   c. The rocks disappear.

9. Why do visitors come to the Racetrack?
   a. to understand science
   b. to see a place where unusual things happen
   c. to watch the rocks move

10. In what category does this article fit?
    a. fascinating places to visit
    b. things that never really happened
    c. mysteries about space aliens
Phenomena

Unit 2 Assessment Article

Directions: Read this article. Then answer each question that follows. Circle the letter of your answer.

The Singing Swarm

There is no escape from the roaring noise. For weeks, the air fills with buzzing, sizzling, humming sounds that are so loud people must yell at each other to be heard. The cicadas (sih KAY duhz) are back!

2 Cicadas are large, winged insects. An individual cicada’s “song” can be pleasing to human ears. In ancient China, people sometimes kept a caged cicada as a source of music in the home. But in nature, cicadas don’t sing alone. In some species, hundreds of thousands of cicadas sing together. In an area of about an acre, there may be one-and-a-half million of them.

3 The members of these super-sized choruses are periodical cicadas. Species of periodical cicadas don’t arrive every year. In eastern North America, some periodical cicadas make an appearance only once every 17 years! (In their southern range, they appear every 13 years.) What are they doing between visits?

4 During those years, the periodical cicadas live underground as nymphs, sucking the juice in tree roots for food. Nymphs are young insects that resemble the adult. Cicada nymphs molt, or shed their skin, several times as they outgrow it. Finally, they emerge through holes in the ground. Those in the same location are in synchrony—and climb out around the same time.

5 After they emerge, the cicadas molt one last time and climb up into the trees. A few days later, as adults, they start blasting the air with noise—or love songs, depending on the viewpoint. Only the male cicadas sing, and the steady sound comes from vibrating structures on their abdomen. Males are calling to attract other males to sing with them, with the shared purpose of attracting females to mate. The loud chorus signals the final stage of one life cycle and the beginning of another.

6 The males die soon after mating, and the females die after they lay eggs. Each female lays hundreds of eggs in twigs. Weeks later, the eggs hatch, and the first nymphs drop from the trees to dig their way underground to begin the cycle again.

7 When thousands of cicadas blanket trees and shrubs, other animals enjoy a feast. Cicadas are food for birds, snakes, dogs, and even people, yet they still manage to produce another generation. Their overwhelming numbers are their survival strategy. Predators eat their fill, but there are still plenty of cicadas left.

8 People sometimes confuse cicadas with locusts, which fly in crop-destroying swarms. Cicadas are not related to locusts and do not destroy crops, though they may damage small young trees. Cicadas are not poisonous, and they don’t bite or sting. Their choral singing can be annoying, but many people look forward to the arrival of these remarkable insects—and to the sense of wonder they inspire.
Phenomena

Unit 2 Assessment Questions

1. Which sentence states the main idea best?
   a. Periodical cicadas make so much noise that people can hear almost nothing else.
   b. Periodical cicadas are insects with a fascinating life cycle.
   c. Periodical cicadas shed their skin several times.

2. What are periodical cicadas?
   a. unusual kinds of locusts
   b. species of insects that appear every year
   c. insects that take years to become adults

3. Which answer is probably true?
   a. People can predict when periodical cicadas will arrive.
   b. People never know when 17-year cicadas will appear.
   c. People see more cicadas in the western United States than anywhere else.

4. What is the meaning of the underlined word?
   Those in the same location are in synchrony—and climb out around the same time.
   a. singing together
   b. living in the same place
   c. happening at the same time

5. The purpose of paragraph 5 is to
   a. describe the noise.
   b. give examples of the noise.
   c. explain the reason for the noise.

6. Which answer correctly restates this sentence from the article?
   The loud chorus signals the final stage of one life cycle and the beginning of another.
   a. A life cycle is like a loud chorus that ends and begins.
   b. The loud chorus means that death will happen soon and that new life will begin.
   c. The last stage of a life cycle is a sign of the loud chorus and a new beginning.

7. What is true of cicada nymphs?
   a. They are hidden from view.
   b. There are few of them.
   c. They do not look like adult cicadas.

8. Why might people confuse periodical cicadas and locusts?
   a. Both are poisonous.
   b. Both arrive in huge groups.
   c. Both are dangerous to crops.

9. What does the author think of cicadas’ songs?
   a. They are noisy and harmful.
   b. They are loud and remarkable.
   c. They sound pleasant.

10. To survive, cicadas probably need an area
    a. without many birds that eat insects.
    b. with warm soil.
    c. with trees and shrubs.
Phenomena
Unit 3 Assessment Article

Directions: Read this article. Then answer each question that follows. Circle the letter of your answer.

Death in the Night

One morning, terrible news spread quickly throughout a village in Thailand. A young, healthy man had died in his sleep. The villagers blamed “ghost widows,” night spirits who steal men. The villagers prepared a charm to stop the spirits. They soaked a holy white thread in the blood of a black dog and stretched it around their houses.

2 In Thailand, traditional customs surround the event known as *lai tai*—death while sleeping. Seemingly healthy Thai men in their 20s to 40s are known to die unexpectedly in their sleep. The tragic event is also familiar to people of the Philippines. According to the traditional beliefs of some Filipinos, a huge female demon suffocates the sleeper by sitting on his chest. The sleep death is known to other peoples of Southeast Asia, too. Every cultural group has a name for it, ideas about its cause, and rituals to prevent it.

3 In the 1970s many Hmong people faced terror and sorrow as they escaped from their homelands in Laos, a country that was caught up in political conflict. Eventually they settled in the United States. When Hmong men began to die mysteriously while sleeping at night, American researchers were puzzled. They named the strange condition sudden unexplained nocturnal death, or SUND.

4 At the time, researchers believed the main cause of SUND was stress. After all, the Hmong were suffering from grief and homesickness in a strange land. It seemed that the men who died were literally heartbroken—their hearts had stopped beating.

5 Scientists no longer think that SUND is the result of stress. The fact that SUND affects Asians more than other peoples suggests that the condition might be inherited—passed from parents to children. Late in the 20th century, scientists pinpointed a mutation, or change, in a gene that affects how heart cells work. The mutation causes a disorder called Brugada syndrome.

6 In Brugada syndrome, which was first described in the early 1990s, the heart’s normal rhythm can be disrupted. People with the disorder may have unexplained fainting spells, and their hearts can suddenly stop beating. Brugada syndrome is about ten times more common in men than in women. Scientists claim that SUND and Brugada syndrome are the same.

7 Tests that measure the heart’s electrical activity can reveal whether a person has Brugada syndrome. Because Brugada syndrome has been studied for only a short while, nobody knows how many people are affected—possibly fewer than .05 percent worldwide. The death rate in some regions of Southeast Asia, however, may be as high as one person per thousand.

8 For now, the only treatment to prevent sudden death is a device placed under the skin to correct abnormal heart rhythms. But until detection and treatment are widespread, strong young men will continue to fall asleep—and never wake up.
Phenomena

Unit 3 Assessment Questions

1. Which sentence states the main idea best?
   a. When strong young men die in their sleep, people blame ghosts.
   b. Nobody knows the real reason that people who seem healthy die in their sleep.
   c. Sudden death during sleep may have a physical cause.

2. Who is most affected by the condition described in the article?
   a. the Hmong
   b. young Thai men
   c. Asian men

3. Which answer is probably true?
   a. The Hmong had no beliefs about the causes of sudden death during sleep.
   b. Back in Laos, the Hmong had never lost men to sleep deaths.
   c. The Hmong knew about sleep death before they arrived in the United States.

4. What is the meaning of the underlined word?  
   For now, the only treatment to prevent sudden death is a device placed under the skin to correct abnormal heart rhythms.
   a. not normal  
   b. stopped  
   c. frequent

5. The purpose of paragraphs 1 and 2 is to
   a. describe how people react to sudden death.  
   b. show ways in which people explain sleep death.  
   c. show the reasons for sleep death.

6. Which answer correctly restates this sentence from the article?
   The villagers blamed “ghost widows,” night spirits who steal men.
   a. The villagers blamed spirits called ghost widows who stole men at night.
   b. The villagers blamed night spirits and ghost widows for stealing men.
   c. According to the villagers, widows who steal men are ghostly night spirits.

7. According to the article, how are traditional Thai and Filipino beliefs alike?
   a. Both cultures use the same name for death during sleep.
   b. In both cultures, a female spirit is the killer.
   c. Both cultures use stories to explain dreams.

8. What do doctors today probably ask when they think someone might have the condition?
   a. Have any of your friends died mysteriously in their sleep?
   b. Have any of your relatives died suddenly in their sleep?
   c. Are you under stress?

9. Why does the author think that young men will continue to die in their sleep?
   a. Nobody understands the cause.
   b. People prefer to hold onto their traditional beliefs.
   c. Medical testing and treatment are not available to all people.

10. In what category does this article fit best?
    a. true stories about unusual medical conditions  
    b. articles about traditions tied to sleeping  
    c. advice about heart health
## Phenomena

### Unit 1 Language Development Activity: *Idioms and Common Phrases*

<table>
<thead>
<tr>
<th>ESL/DI Skill</th>
<th>Idiom: <strong>drives us nuts</strong></th>
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<table>
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<tr>
<th><strong>Activity Highlights</strong></th>
<th><strong>Teacher Preparation</strong></th>
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<tbody>
<tr>
<td>1. Flashcards: individual, partners</td>
<td>1. Review the selection “Moon Madness” (Unit 1, Lesson 7, p. 62).</td>
</tr>
<tr>
<td>2. Deducing word meaning from context: individual</td>
<td>2. Provide three blank index cards per student.</td>
</tr>
</tbody>
</table>
| 3. Reading sentences to the class: individual | 3. Write the following sentences on the board: *A full moon, after all, can be quite bright. Is that what drives us nuts?*
| 4. Writing original sentences: partners | |
| 5. Sharing aspects of personal experience and culture: individual | |

### Activity Steps:

1. Review the article “Moon Madness” (Unit 1, Lesson 7, p. 62) with the class.
2. Volunteers describe the context of the sentence on the board. Ask: According to the context, how might bright light from the moon affect people? (*It might affect their sleep.*)
3. Volunteers discuss what **drives us nuts** probably means in the context of the article. (*Possible response: It makes us feel out of control; we think and act in strange or weird ways.*)
4. Explain that an idiom is a phrase that doesn’t make sense word for word but has a meaning of its own. **Drives us nuts** is an idiom. Note possible variations: drives me nuts, drives him nutty, etc.
5. Write a concise definition of **drives us nuts** on the board: *makes us feel angry or frustrated.* Students write the idiom on one side of an index card and the definition on the other.
6. A volunteer reads the sentences on the board, substituting the definition on the index card for the underlined words: *A full moon, after all, can be quite bright. Is that what makes us feel angry or frustrated?*
7. On the board, write additional idioms and their definitions, for example: *in a nutshell* (“briefly expressed”); *go nuts* (“do something in excess”). Ask volunteers to give examples of a time they went nuts while shopping or attending a sports event.
8. Students pair off. Each partner writes each additional idiom on one side of an index card and its definition on the other. Partners practice silently with their own cards briefly. Then they quiz each other.
9. Write an example sentence using an idiom on the board, for example: *He wants power—that’s his reason in a nutshell.*
10. Partners collaboratively write as many sentences for the idioms as they can. For advanced groups, students collaborate on an original dialogue, poem, or paragraph, using the “Madness” theme, that employs some or all of the idioms. Circulate among the groups to support students’ work.
11. Individuals read their completed work to the class.
12. If students know an idiom used in their home language or in their neighborhood, they write it on the board and share the meaning with the class. If the idiom is connected to a national or neighborhood culture, students explain why.
Phenomena

Unit 2 Language Development Activity: Multiple Meanings

ESL/DI Skill | Multiple-Meaning Words: constant, heavenly, body, business, routine

Activity Highlights
1. Discussion/analysis: small group
2. Writing sentences: individual
3. Reading sentences aloud: small group, individual
4. Note Taker: individual role

Teacher Preparation
1. Review the article “Sunspots: Solar Blemishes” (Unit 2, Lesson 8, p. 76).
2. Write on the board or otherwise present the short passage below this box. (“We usually think ….”)
3. For each group of 3 to 5 people, provide a dictionary.

Activity Steps:

1. We usually think of the Sun as a **constant**, predictable **heavenly body**, a great power that can be counted on not to change. That is because the Sun goes about its **business** in a very **routine** way.*

*Multiple meanings: constant ("always the same" / "occurring again and again"); heavenly ("located in the sky or in space" / "wonderful"); body ("huge mass of material" / "human form"); business ("tasks or concerns" / "an organization that makes profit"); routine ("ordinary" / "steps always followed in the same order")
### Phenomena

#### Unit 3 Language Development Activity: Vocabulary Review

<table>
<thead>
<tr>
<th>ESL/DI Skill</th>
<th>Vocabulary Words: personnel, adequate, disoriented, detected, deprived of</th>
</tr>
</thead>
</table>
| **Activity Highlights** | 1. Interviewing: partners  
2. Note taking: individual  
3. Personal responses/summary of partner’s responses: individual  
4. Optional game: whole class |
| **Teacher Preparation** | 1. Review the article “A Cold Killer” (Unit 3, Lesson 18, p. 162).  
2. Write on the board or otherwise present the Lesson 1 vocabulary words: personnel (“staff”); adequate (“satisfactory”); disoriented (“confused”); detected (“discovered”); deprived of (“denied”).  
3. Read the interview questions below and have a copy on hand. |

#### Interview Questions:

1. Do you believe that for a business, cutting personnel saves money? Why or why not?
2. How much exercise is adequate for you? Why?
3. Have you ever been disoriented? Describe what happened.
4. Give examples of times you have detected that someone was lying.
5. Were you ever deprived of something as a child? What was it?

#### Activity Steps:

1. Review the article “A Cold Killer” (Unit 3, Lesson 18, p. 162) with the class.
2. Review the definitions of the vocabulary on the board with the class.
3. Point out that, in speech and writing, of usually goes after deprived.
4. The class discusses how the vocabulary was used in the article. Tell students that partners will be interviewing each other using these vocabulary words in a new context.
5. Students pair off.
6. Dictate the first interview question aloud: Do you believe that for a business, cutting personnel saves money? Why or why not? Each partner writes the sentence in his or her notebook.
7. Discuss the meaning of the question with the class.
8. Partners ask each other the discussion question in turn. As one partner responds to the question, the other partner takes notes on the response.
9. Repeat steps 5 to 8 with the second (third, etc.) interview question.
10. When all the questions have been covered, the first partner summarizes the second partner’s answers to him or her. The second partner suggests any corrections that may be necessary. Partners then reverse the process.
11. Each partner summarizes the other’s answers to the class.
12. You may extend the activity into a game of “Who Am I?” in which each student gives you a written interview answer to read aloud. (When you play this game, skip step 11.) Shuffle the answers that you receive. The class tries to guess which student was being interviewed in each case. If a guess is incorrect, the student whose name was guessed explains why the answer is not correct for him or her.