

Extreme

EXPLORER

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Dear Educator:

The October issue shines a spotlight on the amazing planet we call home.

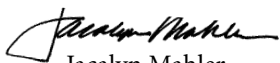
“The Tangled Tale of the Octopus” takes readers into the oceans, where tales of tentacled sea monsters were born. Students will discover how people’s perceptions of octopuses have changed as scientists learn more about the creatures’ anatomy, adaptations, and intelligence. Students’ own perceptions may change as they examine their assumptions before and after reading. The activity on p. T3 will support them in making inferences as they read. As a special bonus, you can use the accompanying poster to introduce students to the concept of animal classification.

In “Eye in the Sky,” readers get a satellite’s-eye view of our planet—and beyond. The story introduces students to satellites and their unique perspective on Earth’s systems. They will discover the roles satellites play in their daily lives—from cell phones to weather forecasts, navigation, and documenting global warming. The graphic organizer on p. T5 will help readers focus on the author’s main ideas by identifying supporting details. Students can use the completed organizer to write a summary of the story.

Finally, in “Passport to Wonder,” readers will come back down to Earth for a globe-trotting trip to see some of the most amazing structures ever built. Using the New 7 Wonders of the World contest as a jumping-off point, the story takes readers to seven amazing sites from the Taj Mahal in India to Machu Picchu in Peru. Throughout, students are encouraged to read with a critical eye and decide for themselves whether or not each site deserves to be considered a Wonder of the World. They can use the Pro/Con activity on p. T7 to organize their thoughts and prepare for writing a persuasive essay.

Whether it’s from an underwater den or an orbiting satellite, we hope you enjoy the view! Let us know. We’d love your feedback on current issues and ideas for future ones. It’s easy to have a say. Just join our EXTREME EXPLORER teachers’ panel. For more information, go to www.extremeexplorer.org and click on the For Teachers tab. You’ll find the teachers’ panel link on the right-hand side of the page.

We can’t wait to hear from you!



Jacalyn Mahler
Editor in Chief

In This Issue

OCTOPUS

PP. 2-9

Curriculum Connections

- Language Arts • Life Science

Standards Correlations

- **Language Arts:** Infer meaning from expository text
- **Life Science:** Diversity and adaptation of living organisms; classification

Literacy Skills

- **Reading Strategy:** Make Inferences
- **Vocabulary:** Greek and Latin Roots

EYE IN THE SKY

PP. 10-15

Curriculum Connections

- Space Science • Earth Science
- Language Arts

Standards Correlations

- **Space Science:** Effects of space and technology research
- **Language Arts:** Determine main idea and supporting details

Literacy Skills

- **Reading:** Determine Importance
- **Vocabulary:** Vocabulary Notebook
- **Writing:** Critical Thinking

PASSPORT TO WONDER

PP. 16-23

Curriculum Connections

- Language Arts • Social Studies

Standards Correlations

- **Language Arts:** Compare and contrast
- **Social Studies:** Geography; ancient cultures

Literacy Skills

- **Reading Strategy:** Make Connections
- **Vocabulary:** Compound Words

Answer Key

Octopuses • Teacher’s Guide, p. T3

Answers will vary. Possible responses: 1. People did not understand what they saw; 2. Adaptations help the octopus thrive underwater; 3. Baby octopuses are vulnerable; 4. Octopuses are survivors; 5. Octopuses are amazing, not scary.

Eye in the Sky • Teacher’s Guide, p. T5

Space Observer (Hubble Space Telescope, outer space research); Communications (cell phones); Weather (clouds, storms, or hurricanes); Navigation/Tracking (GPS, sea rescues, elephant tracking, geocaching); Earth Observer (global warming, volcanoes)

Passport to Wonder • Teacher’s Guide, p. T7

Answers will vary.

Review • Teacher’s Guide, p. T8

1. c 2. b 3. d 4. b 5. a 6. c 7. d 8. b 9. d
10. a 11. b 12. a

Next Issue

Regeneration: Discover how some injured animals can regrow their body parts.

Avalanche! Join a scientist as he buries himself under tons of snow. Learn the cold facts about snow slides.

Human Footprint: How big is your footprint? Find out how your daily choices impact the planet.

Octopus

About the Story

People once feared the octopus, spinning tales of dangerous encounters with the deep-sea monsters. Now, scientists study octopuses in their natural habitats. Students will learn about the amazing variety of octopus species and the animal's adaptations, intelligence, and life cycle.

Fast Facts

- Some octopuses, such as the blue-ringed and glass octopus, carry their eggs with them as they swim and until they hatch. The football octopus, however, carries her eggs *inside* her body until they hatch, making her the only known octopus to give live birth.
- A blanket octopus defends itself by tearing off the stinging tentacles of Portuguese man-of-war jellyfish and waving them at would-be attackers.

Vocabulary

Word Roots: Display the word *octopus*. Highlight the prefix *oct-* and explain that it means “eight.” Discuss how the word part relates to the meaning of *octopus*. Invite students to think of other words with the prefix and discuss their meanings. (Examples: *octagon*, *octave*, *octuplet*) Explain that many words in English contain Latin and/or Greek roots. A root is a word part that has meaning but can't stand by itself. Understanding roots can help students figure out the meanings of unfamiliar words. Suggest that when they come across a long word, students look for familiar word parts. Point out that since many prefixes have multiple meanings, it's always a good idea to confirm what the word means.

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Before Reading

Examine Assumptions: Display the word octopus and ask students to share what they know about the animal. To get the conversation started, have them copy these statements and say whether each one is true or false:

- An octopus often attacks humans. (False)
- You can find an octopus in every ocean. (True)
- The octopus is an intelligent animal. (True)
- The plural of octopus is octopi. (False)

Tell students that, after reading, they will have a chance to revisit and rethink their ideas.

Next, ask students to read the headline and deck on p. 3, and the subheads on the remaining pages. Explain that subheads signal how a story is organized. Based on this preview, ask volunteers to say what they think they might learn from reading the story.

Reading Strategy

Make Inferences: Tell students they can get more out of what they read by “reading between the lines.” By combining ideas in the text with what they already know, they can come up with ideas that the writer doesn't directly say. To model this, ask a student to read aloud the introduction on p. 4. Ask students what they think the author means. (Sample response: Octopuses are aggressive hunters.) To support students in making inferences as they read, have them complete the blackline master on p. T3.

After Reading

- **Make Inferences:** Encourage students to share the inferences they made while reading the story.
- **Review:** Review the assumptions students made before reading the story. Ask students to decide which ideas were accurate and which were not. Urge them to use specific information from the story to support or debunk each one.
- **Research:** Use the poster to explain animal classification. Then encourage student pairs to pick an animal. Ask them to research the animal's phylum, class, and any related animals.

Octopus

As you read these sentences in "The Tangled Tale of the Octopus," tell what you think the writer means.

The writer says...

I think...

1. Some of these ideas came from seeing dead octopuses washed up on shore.

2. There, the shapeless blob becomes speedy and deadly.

3. Only a few [baby octopuses] survive their first days.

4. Predators may find and chase octopuses. But catching them is another thing altogether.

5. Octopuses still have one thing in common with the sea monsters in the old stories. They thrill us.

EYE IN THE SKY

About the Story

How do satellites, many miles above Earth, affect our daily lives? In this story, students will learn how satellites work and the role they play in cell phone conversations, protection of endangered animals, monitoring global warming, navigation, and more.

Fast Facts

- All satellites have certain common features: the “bus” (metal or composite body), power (solar or fuel cells and batteries), an onboard computer, radio system and antenna, and an attitude control system that keeps the satellite pointed in the right direction.
- The term *payload* refers to the computers and sensors that collect the desired information. This may include: cameras, telescopes, thermometers, wind gauges, or particle detectors.
- The Soviet Union sent Sputnik 1, the world’s first artificial satellite, into space on October 4, 1957. That launch started the era of space exploration.

Vocabulary

Vocabulary Notebook: Explain that some of the technical words in the story may be new to students. Display the following words: *satellite*, *geostationary*, *longitude*, *quadrillion*. Before reading the story, have students rate their knowledge of each word from 1 to 3. Students should use a rating of 1 when they don’t know the word. A rating of 2 means they have an idea of what a word means. A rating of 3 means they know a word well enough to teach it to a friend.

Suggest that as students read the story, they record these and other new words in a vocabulary notebook. Each listing should include a short definition or an example as well as a drawing that will help them remember the word’s meaning.

Before Reading

Build Key Concepts: Display the word *satellite* again. Invite students to share what they know about the topic. Then display the word *orbit*. Using a globe and the diagram on p. 13, demonstrate a polar orbit (shown) and a geostationary orbit. In a geostationary orbit, satellites circle in the same direction as the Earth spins and 35,405 kilometers (22,000 miles) above the Equator.

Reading Strategy

Determine Importance: Tell students they are going to learn about satellites and the different ways people use them in their everyday lives. As they read, students should focus on the writer’s main ideas, or what he is mostly saying about the topic. They should also pay attention to important details that support the main ideas. Read aloud the introduction on p. 12. Then model the strategy. Say: *The topic of this story is satellites. In this section, I learned that scientists are using satellites to help track endangered animals. That’s a main, or important, idea. Mike Fay uses satellites to help protect elephants from poachers in Chad. That detail supports the main idea.* Distribute the graphic organizer on p. T3. In pairs, have students read the story, stopping after each section to add details to the web.

After Reading

- **Determine Importance:** Invite students to share their completed webs. Then ask them to use that information to write a summary of the story.
- **Critical Thinking:** Challenge students to think of ways that satellites might be used in the year 2020, such as to locate lost pets or alert people about air pollution. Invite small groups to create a poster that shows both how people use satellites today, and possible uses in the future.

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EYE IN THE SKY

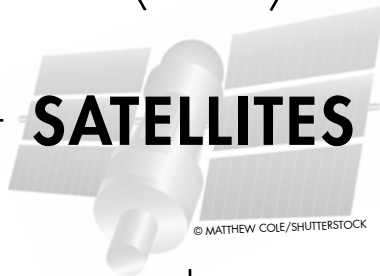
People use different satellites to perform different jobs. Complete the web by adding details for each type of satellite.

Communications

Weather

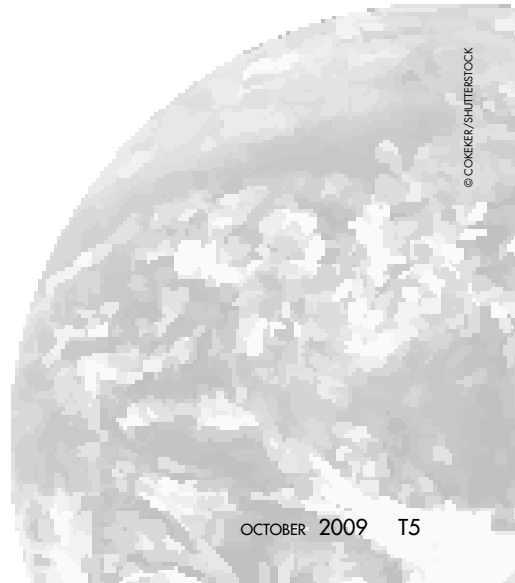
**Space
Observer**

SATELLITES



**Earth
Observer**

**Navigation/
Tracking**



Passport to Wonder

About the Story

In 2007, people around the world voted to pick the New 7 Wonders of the World. This story takes readers to the winning sites, from the Taj Mahal in India to Machu Picchu in Peru. Along the way, students are urged to think critically about these places and decide for themselves if they deserve to be considered a Wonder of the World.

Fast Facts

- Students and their families can read more about New 7 Wonders finalist Angkor, Cambodia, in the July 2009 issue of NATIONAL GEOGRAPHIC.
- Egypt's Pyramids of Giza initially were on the list of 21 finalists in the New 7 Wonders of the World contest. But Egyptian leaders argued the pyramids shouldn't be subject to a vote, in part because the pyramids are one of the original Wonders of the Ancient World. Organizers of the New 7 Wonders contest agreed. They granted the pyramids honorary New Wonder status.
- An Internet contest to pick the New 7 Wonders of Nature is now under way. For more information, go to www.new7wonders.com.

Vocabulary

Compound Words: Display the following words from the story: *worldwide*, *broken-hearted*, *kilometer*. Say: *Each of these words is made up of two words.* Guide students in identifying the two words in each compound word. (*world*, *wide*; *broken*, *hearted*; *kilo*, *meter*) Explain that words made up of two shorter words are called compound words. In some cases, the words are combined to make one word. In other cases, they are hyphenated. Often, the meaning of the compound word is the sum of its parts. Students can use their understanding of the two base words to figure out the meaning of the longer word. To model this, walk students through the meanings of *world*, *wide*, and *worldwide*. Suggest students use this strategy as they come across compound words in the story. (Examples: *moonlight*, *another*, *earthquake*, *marketplace*, *human-made*, *sidewalk*, *underground*, *hand-carved*)

Before Reading

Activate Prior Knowledge: Display the word *building*. Use the following activities to spark a class discussion.

- Have pairs of students do a quick write, brainstorming a list of words that come to mind when they think of the verb *build*. (Examples: *steel*, *concrete*, *construction workers*)
- As a class, discuss the different reasons why people make buildings. (Examples: for shelter, as a memorial)
- Ask volunteers to describe the most amazing building they've ever seen and explain why and what specifically they liked about it.

Reading Strategy

Make Connections: Remind students of their responses to the previous activities. Tell them they will get more out of the story when they connect ideas in the text with ideas from their own experience. Encourage them to use their own ideas to think critically about each Wonder and ask if it should be on the top seven list. To support this strategy, distribute the blackline master on p. T7. They can use the chart to keep track of their reactions and write down brief notes about why (in the *Pro* column) or why not (*Con*) a site should be one of the New 7 Wonders.

After Reading

- **Make Connections:** Ask students to share their responses from the blackline master. Then assign a site (from the story or poster) to each student. The students should prepare a short, persuasive argument about why their site should be a New 7 Wonder. Students can vote anonymously to come up with their own top seven class list.
- **Creative Thinking:** Ask students to imagine they are architects. Their task is to design a building that will become the 8th New Wonder. It can be anywhere in the world—or beyond. After drawing their building, students can present its features to the class.
- **Research:** Students can create a poster about the Seven Wonders of the Ancient World.

Passport to Wonder

Read "Passport to Wonder" in **EXTREME EXPLORER**. Decide what you think. Which places belong on the list of New 7 Wonders? Which ones don't?

New 7 Wonders	Pro	Con
Taj Mahal		
Great Wall of China		
Petra		
Roman Colosseum		
Chichén Itzá		
Machu Picchu		
Christ the Redeemer		

COMPREHENSION CHECK

Answer each question. Fill in the circle by the correct answer.

- Why did people think octopuses were sea monsters?
 - They attack sharks.
 - They live in every ocean.
 - They have many arms.
 - They drag ships to the bottom of the sea.
- How does having no skeleton help an octopus?
 - It is lighter than most animals.
 - It can squeeze through narrow places.
 - Its attracts different prey.
 - It makes it easier to lay thousands of eggs.
- Which of these adaptations helps octopuses escape predators?
 - squirting ink
 - changing color
 - changing skin texture
 - all of the above
- How does a giant Pacific octopus protect her eggs?
 - She hides them in seaweed.
 - She wipes away algae and bacteria.
 - She lays tens of thousands of eggs.
 - She helps them float to the ocean's surface.
- How does Michael Fay use satellites in his work?
 - to protect elephants from poachers
 - to help elephants find food
 - to film elephants for TV shows
 - to recover elephants' ivory tusks
- How are artificial satellites different from natural satellites?
 - You can see them from Earth.
 - You can predict their movements.
 - They are made by humans.
 - They orbit Earth.
- How does a communications satellite stay above the same place on Earth?
 - It follows a polar orbit.
 - It stays in the same place in the sky.
 - It sends radio signals down to Earth.
 - It moves at the speed the planet spins.
- Which of these is *not* an example of how people use satellites?
 - to track global warming
 - to prevent volcanoes from erupting
 - to help rescuers find people
 - to track dangerous storms
- Which is true about all the New 7 Wonders?
 - They are located on all seven continents.
 - They are all really tall.
 - Earthquakes damaged them.
 - They are amazing structures built by people.
- What is a dynasty?
 - kings or rulers from the same family
 - people who fish for a living
 - soldiers who keep enemies away
 - people who take bricks from the Great Wall of China
- What do the Great Wall of China and Petra have in common?
 - Floods damaged them.
 - They are in Asia.
 - They cost millions of rupees to build.
 - They were forgotten for centuries.
- Which animal was used to build which New 7 Wonder?
 - elephants, at the Taj Mahal
 - lions, at the Roman Colosseum
 - snakes, at Chichén Itzá
 - llamas, at Machu Picchu