

NATIONAL GEOGRAPHIC Explorer!

Pioneer Edition

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Dear Teacher:

Be sure to point out the reading strategies that start each article this month. They are powerful tools that will help comprehension.

“Pyramid Puzzle” takes students to ancient Egypt, inviting and equipping them to make inferences about that dazzling civilization.

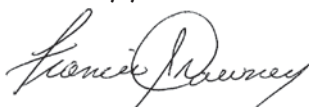
“Nature’s Candy” explains the science behind sweets, spurring pupils to use nonfiction features (headline, photo) to make predictions about what they will read.

“Owls: Built to Hunt” provides an expert’s-eye view of the adaptations that make owls such formidable hunters and challenges students to identify important ideas as they read.

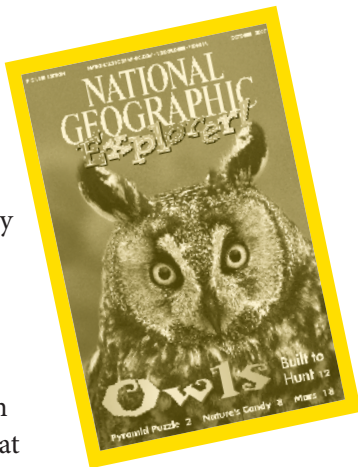
“The Changing Face of Mars” shows readers the power of background knowledge. Comparing what they knew before reading with what they learned from reading will help students see how prior knowledge aided their understanding of new information.

Now it’s time to put these reading strategies to work.

Sincerely yours,



Francis Downey
Vice President and Publisher



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In This Issue

PYRAMID PUZZLE

PP. 2-7

Curriculum Connections

- Social Studies • Reading • Writing

Standards Correlations: Social Studies

- People, places, and environments
- Early civilizations

Literacy Skills

- Reading Strategy: Infer Meaning
- Sequencing • Reading and Making Maps

OWLS: BUILT TO HUNT

PP. 12-17

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Standards Correlations: Science

- Characteristics of organisms
- Organisms and environments

Literacy Skills

- Reading Strategy: Determine Importance
- Compare and Contrast • Research and Write
- Use Vocabulary to Predict

THE CHANGING FACE OF MARS

PP. 18-23

Curriculum Connections

- Space Science • Reading • Writing

Standards Correlations: Science

- Objects in the sky
- Changes in Earth and sky

Literacy Skills

- Reading Strategy: Activate and Connect
- Predicting • Oral Language
- Research and Write

Answer Key

Pyramid Puzzle • Teacher’s Guide, p. 3

1. true 2. false 3. true 4. true
5. false 6. false 7. false 8. true

Owls: Built to Hunt • Teacher’s Guide, p. 5

- Possible answers: 1. grab prey so it cannot escape 2. tear prey in pieces 3. spot prey even in low light 4. detect prey that is difficult to see 5. listen sharply for prey; sneak up on prey

Review • Teacher’s Guide, p. 8

1. a 2. b 3. c 4. c 5. b 6. a 7. d 8. c

Next Issue

Crystals

A geologist takes readers into a crystal cave.

On Thin Ice

Global warming threatens Arctic animals.

Water Wonders

Tiny, stunning creatures dwell in seawater.

Pyramid Puzzle



Reading Strategy

Infer Meaning: Tell students that to infer is to draw a conclusion that the author does not state directly. Inferring involves taking clues and combining them with background knowledge to come up with ideas that are not explicit in the text. As students read, encourage them to look for clues that can help them predict outcomes, come up with ideas not written in the text, and answer questions that are not answered by the author. Remind students that inferences are based on textual clues. Inferences are not simply guesses.

Vocabulary

Write *context clues* on the board. Explain to students that these are clues around an unknown word that can help them figure out the word's meaning. Point out the word *archaeologist* (p. 3). Ask students how they would figure out the word's meaning if it weren't in the article's glossary. Point out that the next sentence gives a definition. Do the same thing with other words in the article, such as *mummy* (p. 4) and *afterlife* (p. 4).

Fast Facts

- The Great Pyramid is 137 meters (449 feet) tall. It towers over the Statue of Liberty (93 meters, 305 feet), the U.S. Capitol (88 meters, 288 feet), and the Leaning Tower of Pisa (55 meters, 179 feet).
- The base of the Great Pyramid covers five hectares (thirteen acres).
- Each block of the Great Pyramid weighs about 2.5 tons—the equivalent of 25 refrigerators.
- The Great Pyramid was built in about 2500 B.C.
- The plans for the Great Pyramid originally called for the burial chamber to be underground, as in most other pyramids. In the fifth year of Khufu's reign, however, the plans were dramatically altered to place the burial chamber above ground, inside the pyramid itself.
- Khufu's father, Sneferu, built the first smooth-side pyramids. Earlier pyramids had stepped sides.

Comprehension Check

Copy and distribute the Comprehension Check work sheet (next page) for students to complete.

Critical Thinking and Writing

- **Sequencing:** Direct students to create a time line or flowchart that identifies, in order, the steps involved in making a mummy.
- **Creative Writing:** Remind students that Zahi Hawass is using robots to explore tunnels too small for humans to visit. Invite students to imagine that they had a similar robot. Then have them write a composition that tells where they would use the robot to explore and why.
- **Inference:** Invite students to brainstorm about what may have happened to the mummy of King Khufu. Challenge them to base their inferences on facts from the article and their own background knowledge.

Extension Activities

- **Language Arts:** Challenge students or groups to write a play about archaeologists' using robots to explore the mysterious tunnels in the Great Pyramid.
- **Social Studies:** Form small groups and have each group create a model of the Great Pyramid.

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Pyramid Puzzle



Read "Pyramid Puzzle" in NATIONAL GEOGRAPHIC EXPLORER. Then decide whether each sentence below is true or false. Put a T next to any true sentence and an F next to any false one.

- _____ 1. An archaeologist studies the past.
- _____ 2. Egypt has more than 2,000 pyramids.
- _____ 3. Ancient Egyptians believed in life after death.
- _____ 4. Priests poured salt all over dead bodies to dry them out.
- _____ 5. The brain was the one body part left inside a mummy.
- _____ 6. The Great Pyramid was built for a king named Ramses.
- _____ 7. Archaeologists have found many mummies inside the Great Pyramid.
- _____ 8. Making a mummy took about 70 days.



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Owls

Built to Hunt

Reading Strategy

Determine Importance: Remind students that strategic readers sift through what they read to decide which information is most important. Encourage students to ask themselves as they read, “What does the author want me to remember?” Tell students to place sticky notes near important ideas as they read. After reading, students can gather in small groups to share important ideas and create summaries of the article.

Vocabulary

Direct attention to Wordwise (p. 16). Preview the words and definitions with students and challenge them to restate the definitions in their own words. Then invite students to use the glossary as a basis for predicting what they will read about.

Fast Facts

- Owls live on every continent except Antarctica.
- Snowy owls breed in just a few places in the world. The only place in the United States where snowy owls breed is Barrow, Alaska.
- Owls cannot digest the bones, fur, feathers, or teeth of their prey. These get stuck in the owl’s gizzard, a part of its stomach. They form a clean, rounded chunk called a pellet. An owl regurgitates a pellet every day or so. Dissecting owl pellets helps scientists study the birds’ diets.
- Most owls don’t build nests. Instead, they move into tree cavities or take over nests abandoned by hawks, crows, ravens, or other birds.
- Many owls benefit humans by eating rodents.

Comprehension Check

Copy and distribute the Comprehension Check work sheet (next page) for students to complete.

Critical Thinking and Writing

- **Compare and Contrast:** Invite students to think of other predators, such as hawks, lions, sharks, spiders, and wolves. For each predator, ask: How is this animal similar to an owl? How does it differ? Encourage students to create a Venn diagram comparing an owl to another predator.
- **Inquiry:** Direct students to write three questions they would ask owl expert Denver Holt if they had the opportunity to interview him. Have them explain why they want to ask those questions.

Extension Activities

- **Research:** Direct attention to the blue text at the end of the article (p. 16). Have each student pick a different animal to study. Tell students to create a page about their animal, identifying at least three adaptations and explaining how each one benefits the animal. Put the pages together to create a class book on animal adaptations.
- **Social Studies:** Tell students that people have viewed owls in different ways—as wise, for example, but also as omens of bad luck. Have students research and report on owl folklore from various times and places.
- **Language Arts:** Ask students what an adjective is (*word that describes a person, place, or thing*). Have them find three adjectives in the article and use each one in a sentence.

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**How does each adaptation below allow an owl to live?
Write your ideas in the chart.**

Adaptation	How does the adaptation allow an owl to live?
1. Sharp claws	
2. Curved beak	
3. Strong eyes	
4. Keen hearing	
5. Flying quietly	

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The Changing Face of

MARS

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Reading Strategy

Activate and Connect: Say: *When we think about what we already know about a topic, we can understand new information as we read it.* Read the title of the article with students and preview the photographs and captions. Ask students what they already know about Mars. Then have them list some of the facts they know in the first column of the Reading Strategy work sheet (next page). As students read, they can write information they learn about Mars in the second column of the work sheet.

Vocabulary

Ask students what a verb is (*word that expresses an action or state of being*). Explain to students that using lively verbs can paint a dramatic picture for readers. Read the first paragraph (p. 19) aloud. Challenge students to identify the verbs in the paragraph (*was, blew, blasted, fell, rushed*). Ask what kind of pictures these verbs created in students' minds. Then invite students to skim the remainder of the article and circle any verbs that help create a dramatic picture for them.

Fast Facts

- Mars is named after the Roman god of war.
- Mars is the fourth planet from the sun. Its mean distance from the sun is 227,834,400 kilometers (141,600,000 miles).
- The red planet has a diameter of 6,795 kilometers (4,223 miles). Only Mercury is smaller.
- A day on Mars is slightly longer than a day on Earth. It is 24 hours and 37 minutes long.
- The red planet has a thin atmosphere. It is mainly composed of carbon dioxide, nitrogen, argon, and oxygen.
- The temperature on Mars rarely rises above freezing.
- Two small moons, Phobos and Deimos, orbit the red planet.
- Some dust storms on Mars are so large that they engulf the entire planet.

Comprehension Check

Return to the Reading Strategy work sheet you gave out earlier. Invite students to share about how their background knowledge helped them understand the article.

Critical Thinking and Writing

- **Responsive Writing:** Instruct students to look at the information on their charts. Then have them write a paragraph beginning with one of the following prompts:
 - a. I never knew . . .
 - b. I was surprised to learn that . . .
 - c. I can't believe . . .
 - d. Reading about Mars reminded me . . .
- **Predicting:** Read the last paragraph (p. 22) aloud to students. Then challenge them to answer the question posed in the final sentence: "What will it [Mars] look like next?"
- **Oral Language:** Form small groups. Invite each group to discuss the following question: Why is it important to study other planets?

Extension Activities

- **Science:** Form seven groups. Assign each group a planet other than Mars. Have the group research its planet, then create a Venn diagram showing how it is similar to and different from Mars.
- **Creative Writing:** Encourage students to imagine a future in which humans can visit other planets. Tell them to use the information in the article, perhaps supplemented by some research, to create a poster to entice tourists to visit Mars.
- **Math:** Explain that Mars is smaller than Earth. Therefore its gravity, or pulling power, is less. As a result, anything on Mars weighs only a third of what it would on Earth. Challenge students to figure out what the following animals would weigh on Mars (by dividing the weight in three).
 - Coyote:** 36 pounds (*12 pounds*)
 - Koala:** 18 pounds (*6 pounds*)
 - Skunk:** 12 pounds (*4 pounds*)



Before you read: Write information that you already know about Mars.

As you read: Write new information that you learn about Mars.

What I Know About Mars

What I Learned About Mars

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After you read: Think about how writing down what you already knew helped you understand the article.

COMPREHENSION CHECK

Fill in the circle before the correct answer to each question below.

- Why is Mars called the red planet?
 - Red rocks cover its surface.
 - Active volcanoes spew red lava.
 - It is the hottest planet.
 - none of the above
- Which body part did Egyptian priests leave inside a mummy?
 - brain
 - heart
 - liver
 - stomach
- What is the name of the sticky stuff from a tree that is used to make gum?
 - blood
 - cacao
 - sap
 - syrup
- Owls are predators. What does that mean?
 - They are active during the day.
 - They build nests.
 - They eat other animals.
 - They lay eggs.
- The Great Pyramid was built for which Egyptian king?
 - Akhenaten
 - Khufu
 - Ramses
 - Tutankhamun
- Which tree does chocolate come from?
 - cacao
 - mastic
 - sapodilla
 - spruce
- Which is *not* an adaptation that allows owls to hunt?
 - flying quietly
 - good hearing
 - sharp eyes
 - webbed feet
- Which planet has the largest volcano ever found?
 - Earth
 - Jupiter
 - Mars
 - Saturn

