

4

READING EXPLORER

THIRD EDITION

TEACHER'S BOOK

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**Reading Explorer Teacher's Book 4
Third Edition**

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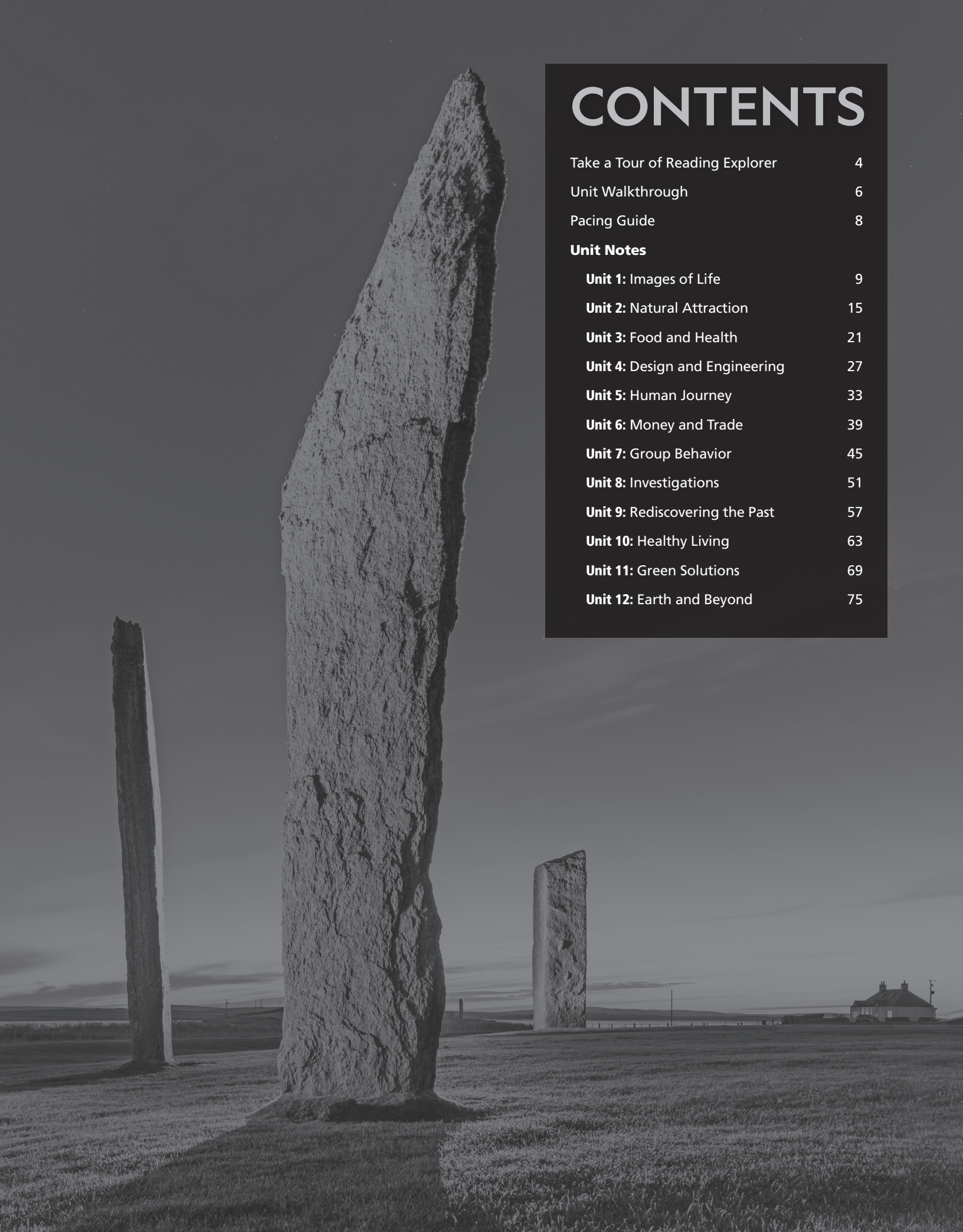
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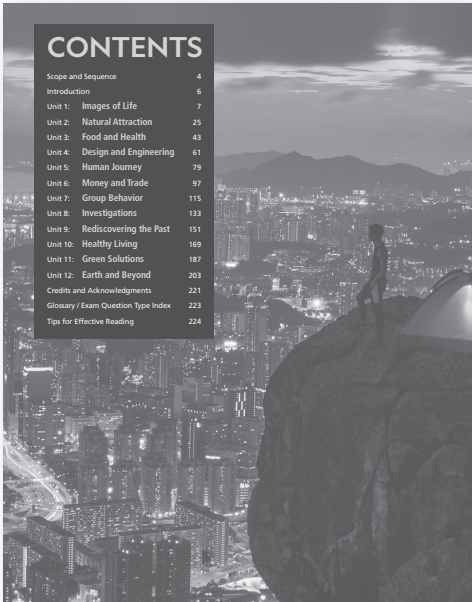
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TAKE A TOUR OF READING EXPLORER

Thank you for choosing to use *Reading Explorer* 3rd Edition Level 4. Here are 7 steps to help you get familiar with the course:

- 1 First, look at the list of **Contents** on page 3 of the Student's Book. You'll see the book is organized into 12 units. The book can be used for a short course of 24–36 hours using just the core units or can be extended for longer courses, for example, by using the **Video** activities in class. **Split editions** are also available for shorter courses.
- 2 Look at the **Scope and Sequence** on pages 4–5 of the Student's Book. You'll see that each unit is based on a theme of general interest, for example, "Money and Trade." Within each unit are two lessons, each based around a reading passage. Each lesson covers a range of reading skills and vocabulary building activities. An **introduction** on page 6 of the Student's Book highlights the new features of the Third Edition.
- 3 Skim through a **Unit** of the Student's Book and compare it against the Unit Walkthrough on the following pages of this Teacher's Book. The Teacher's Book also provides teaching suggestions and background notes for each unit.



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SCOPE AND SEQUENCE

UNIT	THEME	READING	VIDEO
1	Images of Life	A: The Visual Village B: My Journey in Photographs	A Photographer's Life
2	Natural Attraction	A: Living Light B: Feathers of Love	Jellyfish
3	Food and Health	A: How Safe Is Our Food? B: The Battle for Biotech	Is Our Food Safe?
4	Design and Engineering	A: Design by Nature: Biomimetics B: Weaving the Future	Robotic Hands
5	Human Journey	A: The DNA Trail B: Fantastic Voyage	Cave Artists
6	Money and Trade	A: How Money Made Us Modern B: The Rise of Virtual Money	Take the Money ... and Run?
7	Group Behavior	A: A Crowd in Harmony B: Our Online Behavior	Social Conformity
8	Investigations	A: Who Killed the Emperor? B: In the Crime Lab	Beating a Lie Detector
9	Rediscovering the Past	A: Virtually Immortal B: Lure of the Lost City	Archeology from Space
10	Healthy Living	A: Living Longer B: In Search of Longevity	You Are What You Eat
11	Green Solutions	A: Saving Water B: Technology as Trash	Your Water Footprint
12	Earth and Beyond	A: Planet Hunters B: The Threat from Space	Shooting Stars

ACADEMIC SKILLS		
READING SKILL	VOCABULARY BUILDING	CRITICAL THINKING
A: Understanding Words with Multiple Meanings B: Scanning for Information (1)—Short Answer Questions	A: Suffix -tic B: Synonyms of <i>thus</i>	A: Evaluating Pros and Cons B: Interpreting; Reflecting
A: Summarizing (1)—Using a Concept Map B: Identifying Figurative Language	A: Word root <i>scend</i> B: Suffix -ility	A: Speculating B: Interpreting/Applying; Speculating
A: Recognizing Cause and Effect Relationships (1) B: Evaluating Arguments	A: Suffix -wide B: Synonyms of <i>diminish</i>	A: Analyzing Solutions B: Evaluating Arguments and Ideas
A: Scanning for Information (2)—Matching Information to Paragraphs B: Recognizing Lexical Cohesion	A: Collocations with <i>vital</i> B: Prefix <i>fore-</i>	A: Applying Ideas B: Applying Ideas
A: Synthesizing Information B: Distinguishing Fact from Speculation	A: Collocations with <i>rate</i> B: Suffix -ous	A: Reflecting/Evaluating B: Reflecting
A: Understanding the Function of Sentences B: Summarizing (2)—Creating an Outline	A: Collocations with <i>policy</i> B: Word usage: <i>principle</i> vs. <i>principal</i>	A: Evaluating Pros and Cons B: Reflecting
A: Understanding Words from Context B: Understanding Word Roots and Affixes	A: Suffix -ant B: Collocations with <i>pressure</i>	A: Analyzing Information B: Applying Ideas; Reflecting
A: Evaluating Evidence B: Understanding Idiomatic Expressions	A: Collocations with <i>dispute</i> B: Word root <i>leg</i>	A: Interpreting/Reflecting B: Interpreting/Reflecting; Evaluating Reliability
A: Recognizing Ellipsis B: Scanning for Information (3)—Summary Completion	A: Collocations with <i>virtual</i> B: Word usage: <i>legend</i> vs. <i>myth</i> vs. <i>folklore</i>	A: Evaluating/Justifying B: Evaluating Pros and Cons; Reflecting
A: Recognizing Cause and Effect Relationships (2) B: Understanding Quantitative and Qualitative Data	A: Compound words with <i>life</i> B: Collocations with <i>relief</i>	A: Applying Ideas B: Relating to Personal Experience; Reflecting
A: Identifying Sources of Information B: Understanding a Writer's Attitude	A: Collocations with <i>extent</i> B: Collocations with <i>substance</i>	A: Evaluating Sources B: Inferring Attitude; Evaluating Solutions
A: Recognizing Cause and Effect Relationships (3) B: Interpreting Analogies	A: Prefix <i>com-</i> B: Prefix <i>di-</i>	A: Justifying an Opinion B: Evaluating Pros and Cons; Ranking Projects

1A

Amateur photographer Haig Gilchrist captures the moment a giant wave hits a ferry near Sydney Harbour, Australia. This dramatic photo was viewed by thousands online.

BEFORE YOU READ

DEFINITIONS A. Read the sentence below. Match the correct form of each word in bold with its definition (1–3).

In addition to using professional **photojournalists**, many magazines and newspapers today rely on **amateur** photographers to **document** important events.

- _____ to record in written or photographic form
- _____ working without being paid, not professional
- _____ a reporter who shares news using images

SKIMMING B. Skim paragraphs A and B. Which of these statements would the author most likely agree with? Circle a, b, or c. Check your answer as you read the passage.

- The quality of smartphone photos is usually not very good.
- Smartphones and apps have allowed anyone to be a photographer.
- Many photojournalists don't approve of amateur photography.

THE VISUAL VILLAGE

A Before the age of the smartphone, aspiring photographers had to learn how to use high-tech cameras and photographic techniques. Not everyone had cameras, and it took skill and a good eye to capture and create a great photograph. Today, with the huge range of camera apps on our smartphones, we are all amateur photographers. And pretty good ones, too: The quality of smartphone images now nearly equals that of digital cameras.

B The new ease of photography has given us a tremendous appetite for capturing the magical and the ordinary. We are obsessed with documenting everyday moments, whether it's a shot of our breakfast, our cat—or our cat's breakfast. And rather than collect pictures in scrapbooks, we share, like, and comment on them with friends and strangers around the globe.

C Even photojournalists are experimenting with cell phones because their near invisibility makes it easier to capture unguarded moments.¹ The Internet also allows photojournalists to avoid traditional media. They can now act as their own publishers—reaching huge audiences via social media sites such as Instagram. A photograph taken in New York can get a response from someone in Lagos within a second of being uploaded.

D In the past, magazines published unforgettable photos of important people and global events that captured our imaginations. These photos had the power to change public opinion—even the course of history. But if there are fewer memorable images today, it's not because there are fewer good images. It's because there are so many. No one image gets to be special for long.

E Cameras are everywhere—a situation that is transforming the way we experience dramatic events. When there are major political events or natural disasters, it is ordinary citizens with cell phones—not photojournalists—who often provide the first news images. Quality still matters, but it's less important than what's instantly shared.

F As people everywhere embrace photography and the media make use of citizen journalists, professional standards appear to be shifting. In the past, most people trusted photojournalists to accurately represent reality. Today, however, digital images can be altered in ways the naked eye might

1 Something done in an **unguarded moment** is done when you think no one is watching.

4 Turn to one of the **Reading Passages** (e.g., Student's Book 4 page 8). The passages are adapted from authentic National Geographic sources, which are listed in the Credits at the back of the Student's Book. Each passage is also available as an audio recording in the **DVD/Audio CD Package** and on the **Classroom Presentation Tool**, providing a useful model for pronunciation. Useful, high-frequency words, aligned with the CEFR, are highlighted in each reading passage.

5 Check out the **Video clips** on the **DVD/Audio CD Package**. The clips can be used with the **Video** section at the end of each Student's Book unit, and also with the video comprehension activities in the **Online Workbook**.

6 The following **support components** are available for each level of the series:

- **Online Workbook** featuring the 12 video clips from the Student's Book and a variety of interactive, self-grading activities.
- **Classroom Presentation Tool** with answer keys for the Student's Book activities and extra practice questions for target vocabulary.
- **Student's eBook** as a digital version of the Student's Book.
- An **Assessment Suite** containing ExamView® question banks is available for teachers who want to create customized tests or give students additional language practice.

7 A **Website** is also available at ELTNGL.com/readingexplorerseries. It contains audio recordings of the 24 reading passages, 12 video clips from each unit, video scripts of each video, a list of key vocabulary for that particular level, class worksheets, graphic organizers, ExamView® question banks, and the Teacher's Book.

INSTRUCTIONS ▲
Watch the video. Complete the summary.



communicate take care of behavior smaller extinct large

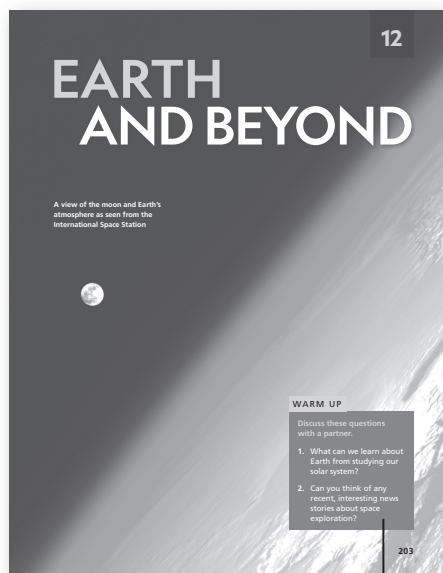
As most people are aware, the lion is a _____ cat. Lions can weigh several hundred pounds and grow to be over 10 feet long. But lions have many other interesting qualities.

For one thing, a lion's roar is very loud. Lions roar for different reasons; for example, to _____ with other lions and to keep other lions away from their territory. Another aspect of lion _____ is that they live in groups called prides. Prides usually consist of one male and several females. Prides work together to find food and _____ their offspring.

In the past, there were several lion species, but today, most are _____. Only two types remain, the African lion and the Asiatic lion. Sadly, today's lion population is getting _____ due to a combination of illness, hunting, and human impact on their habitats.

Show Answers Submit

UNIT WALKTHROUGH

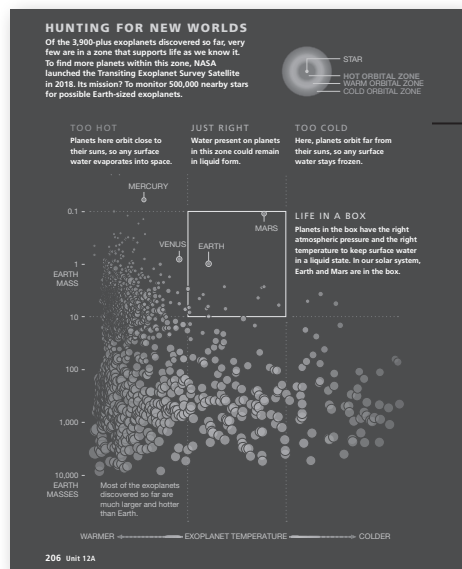


Warm Up discussion questions raise learners' interest in the unit theme and activate prior knowledge.



Before You Read tasks introduce key terms that learners will encounter in the reading passage, and develop previewing skills such as skimming and making predictions.

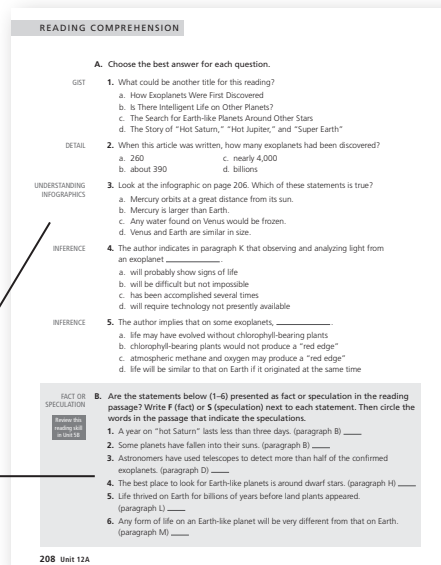
Each **Reading Passage** is adapted from an authentic National Geographic source. **Target vocabulary** is carefully selected in line with CEFR leveling.



Infographics, maps, and charts support the reading passages and develop learners' visual literacy.

Reading Comprehension activities include various types of multiple choice questions (e.g., main idea, detail, reference).

This section also features **exam-style question types** commonly encountered in standardized tests such as IELTS and TOEFL®. An index of question types is at the back of the Student's Book.



READING SKILL

Recognizing Cause and Effect Relationships (3)

As you learned in Units 3A and 10A, signal words such as *because* (*cf*), *due to*, and *thus* indicate cause and effect relationships. Often, though, the author may not state these relationships directly—you have to infer them from the context. Take a look at the cause (underline) and the effect (circle) in this example from the reading passage:

There's a "hot Saturn" 260 light-years from Earth that orbits its parent star so rapidly that it year there lasts less than three days.

In this example, the effect of the "hot Saturn" exoplanet traveling so quickly around its star is that a year there is very short.

CAUSE AND EFFECT

A. Match these effects (1–6) with their causes (a–g) according to information from Reading A. One cause is extra.

1. To observe transits, astronomers will have to observe many stars.
2. Scientists have been able to detect these exoplanets using a telescope.
3. When searching for signs of life on an exoplanet, scientists look for a "red edge."
4. These exoplanets become "floaters" that wander in eternal darkness.
5. The upper atmosphere of this exoplanet is being blasted off by the star's solar winds.
6. Mass extinctions of plants and animals took place.

- a. Only about 10 percent of transits, or "mini-eclipses," can be seen from our planet.
- b. Some exoplanets are thrown out of their original orbits.
- c. Chlorophyll-bearing plants reflect a red light.
- d. In the distant past, the Earth was struck by asteroids and comets.
- e. The "hot Jupiter" exoplanet orbits relatively close to its parent star.
- f. Life existed on Earth for a very long time before land plants appeared.
- g. More than half of the known exoplanets are big, bright, and far away from their stars.

CRITICAL THINKING *Justifying an Opinion* Space exploration requires a great deal of money, time, and effort. Which of the following statements do you agree with the most? Why? Check (✓) the option that best reflects your opinion. Then discuss your reasons with a partner.

☐ I think space exploration is very important and is worth all the resources we invest in it.

☐ I think space exploration is a waste of resources that could be better used on Earth.

☐ I think space exploration is important, but we should limit it to just within our own solar system.

Unit 12A 209

Reading Skill sections provide learners with the tools they need to become effective and critical readers. Core reading skills are recycled and reinforced throughout the book.

Critical Thinking sections challenge learners to analyze, evaluate, and reflect on what they've read, and form their own opinions.

VOCABULARY PRACTICE

COMPLETION

A. Circle the correct words to complete the information below.

"Hence / To date, scientists hoping to make contact with aliens have focused on sending radio waves through our 'atmosphere / exclusion and out into space. But a new study suggests sending physical material—a sort of message in a bottle—may be preferable. A physical message can hold more information and journey farther than radio waves."

The problem, though, is that this method is slow. As astronomer Seth Shostak says, "It's like the difference between sea post and airmail." Some astronomers feel we should forget about trying to communicate within the "exclusion / scope of our own lifetimes. It would take thousands of years for a physical message to reach and return from an exoplanet. A two-way conversation is 'spas / hence out of the question."

WORDS IN CONTEXT

B. Complete the sentences. Circle the correct words.

1. Atomic energy is another term for solar / nuclear / electrical energy.
2. If something spies, it goes in and out / up and down / around and around quickly.
3. If you resemble someone, you are similar to / different from / identical to them.
4. If you thrive in a new job, you are really / moderately / not very good at it.
5. If you exclude someone from a group, they are part / occasionally part / not part of it.
6. The composition of an object refers to its total cost / the parts it is made of / its various colors.

WORD PARTS

C. The prefix *com-* in composition means "together" or "with." Complete the sentences using the words in the box. One word is extra.

combine compared compile composed

1. Mars's atmosphere is mostly _____ of carbon dioxide, argon, and nitrogen.
2. Hydrogen and oxygen atoms _____ to make water molecules.
3. The exoplanet Kepler-452b's star is apparently older than the Earth's sun—6 billion years, _____ to 4.5 billion years.

210 Unit 12A

Vocabulary Practice sections focus on the target vocabulary items from the reading passage.

This section also provides **expanded vocabulary practice** focusing on collocations, word usage, and word families.

THE THREAT FROM SPACE

METEOR CRATERS

- 1.17 kilometers (0.73 miles) wide 50,000 years ago
- SUDBURY 248 kilometers (155 miles) wide 1.9 billion years ago
- CHESAPEAKE BAY 85 kilometers (53 miles) wide 35 million years ago
- CHICKLUP 172 kilometers (106 miles) wide 65 million years ago

The colored dots in these images of Earth are places where meteorites have struck our planet and left craters as evidence.

WEIGHTS OF CRATERS

- A. More than 180 kilometers (100 miles)
- B. 65 kilometers (41 miles)
- C. 17–85 kilometers (11–53 miles)
- D. 16 kilometers (10 miles)
- E. One-third to two-thirds of a mile

212 Unit 12B

A. It was just after 9 p.m. on June 18, 2004, at an observatory¹ in Arizona, in the United States. Astronomer David Tholen was scanning the sky for asteroids when he noticed an object headed toward Earth. He and his colleagues hoped to take a closer look later that week but, unfortunately, were prevented by rain. By the time the team finally got another look at it, they realized they had a problem. The object was a large asteroid, which they named Apophis, after the Egyptian god of evil. Bigger than a sports arena, it comes frighteningly close to our planet every few years. By December, Tholen had calculated that the chance that Apophis would smash into Earth on April 13, 2029, was one in 40.

B. Alarm about the threat started to spread. Then, on December 26, 2004, a real catastrophe struck the Indian Ocean tsunami, which claimed hundreds of thousands of lives. The public forgot about Apophis. Meanwhile, astronomers had found earlier images of the asteroid. The extra data enabled them to calculate its orbit, and they discovered that it would actually fly safely by Earth in 2029. However, this alarming scenario started a race among scientists to find solutions to the threat of large objects striking Earth.

¹ An **observatory** is a building with a large telescope from which you can study the stars and planets.

210 Unit 12A

Near Misses

C. Every day, tons of dust² from comets and pieces of asteroids the size of grains of sand burn up in the Earth's upper atmosphere. Most days, a piece or two of rock or metal—the size of an apple or bigger—actually makes contact with Earth. Yet it's unlikely you'll ever be struck by a meteorite. Very few meteorites have hit a person. In 1954, a grapefruit-sized rock bounced off Ann Hodges's head and hit her as she lay on her side near Sylacauga, Alabama, in the United States. She escaped with only a bruised hip and wrist.

D. Since then, there have been some spectacular near misses. On August 10, 1972, an object the length of a car and weighing 150 tons traveled through the upper atmosphere. Hundreds of people saw its bright trail that sunny afternoon as it crossed the sky from Utah, in the United States, to Alberta, Canada, before flying back out into space. On March 22, 1989, a rock measuring 300 meters across came within several hundred thousand kilometers of Earth, which—in astronomical terms—is uncomfortably close.

² Dust particles are extremely small pieces of dirt or sand.

Unit 12B 213

A **second reading** in each unit expands learners' knowledge of the unit theme and further builds vocabulary. Reading B is also followed by Reading Comprehension, Reading Skill, and Vocabulary Practice sections.

VIDEO

A meteor shower as seen from Pike National Forest, Colorado

SHOOTING STARS

BEFORE YOU WATCH

DISCUSSION

A. Look at the photo above. What do you know about meteors or meteor showers? What adjectives would you use to describe a meteor shower? Discuss with a partner.

PREVIEWING

B. Read this information. The words in **bold** appear in the video. Match these words with their definitions below.

Among the most stunning sights of the night sky are meteor showers. These appear to us as **streaks** of light, and are commonly called "shooting stars." Legend has it that if you wish upon a shooting star, your wish will come true. This tradition is thought to date back to the time of the Greek astronomer Ptolemy (around A.D. 127–151). We now know that shooting stars are not stars at all—they are just bits of rock! There is a huge amount of rocky **debris** in outer space. As these pieces of rock crash through Earth's atmosphere, they sometimes create spectacular meteor shower events. Meteor showers are a reminder of our place in a dynamic, **mystical** solar system.

1. streak • a. inspiring a sense of awe and fascination
2. debris • b. a long, thin line or mark that is easily noticed
3. mystical • c. fragments or remnants of something

Video 219

Each unit concludes with a **video** related to the unit theme, supported by previewing and viewing activities.

WHILE YOU WATCH

GET

A. Watch the video. Check (✓) the topics that are covered in the video.

- a. superstitious beliefs about meteors
- b. the science behind meteor showers
- c. times of the year when most meteor showers occur
- d. the difference between meteors and meteorites
- e. the names of some meteorites from Mars

EVALUATING STATEMENTS

B. Watch the video again. Are the following statements true or false, or is the information not given? Circle T (true), F (false), or NG (not given).

1. Meteorites are smaller than asteroids. T F NG
2. When a meteoroid enters Earth's atmosphere, it cools down. T F NG
3. There are about 21 meteor showers every year worldwide. T F NG
4. Meteor showers are named after the constellation from which the meteors appear to originate. T F NG
5. The largest meteorite ever found was discovered in Namibia. T F NG
6. Space debris is a threat to active satellites and spacecrafts. T F NG

CRITICAL THINKING *Ranking Projects* Which of these projects from this unit do you think is most important for scientists to focus on? Rank them 1–3 (1 = most important; 3 = least important). Then compare answers with a partner and give reasons.

- _____ Searching for Earth-like exoplanets
- _____ Attempting to make contact with other life forms
- _____ Researching ways to reduce damage from asteroids and meteorites

VOCABULARY REVIEW

Do you remember the meanings of these words? Check (✓) the ones you know. Look back at the unit and review any words you're not sure of.

Reading A

☐ atmosphere	☐ atomic	☐ composition	☐ exclude*	☐ hence*
☐ sequence	☐ scope*	☐ spin	☐ thrive	☐ to date

Reading B

☐ catastrophe	☐ deflect	☐ dilemma	☐ engage	☐ motor
☐ nuclear*	☐ numerous	☐ rotate	☐ scenario*	☐ smash

* Academic Word List

220 Video

Critical Thinking encourages learners to connect the video's content with what they have learned in the rest of the unit.

Vocabulary Review sections give learners the chance to check their understanding of the unit's target vocabulary. Extra practice activities can be found on the Classroom Presentation Tool.

PACING GUIDE

One unit of *Reading Explorer* typically takes between 2.5–3 hours to complete. All 12 units require approximately 30–36 hours.

By setting aside portions of each unit as homework, or by using extension activities and ancillaries, the length of a *Reading Explorer* course can be adapted to suit a wide range of course durations. Here are some examples:

Recommended Course

- Total course length = **36 hours** (1 unit = 3 hours)
- 12-week course = 3 hours of instruction per week
- 24-week course = 1.5 hours of instruction per week
- This option assumes that the teacher covers all Student's Book content in class. Supplementary activities are given as homework.

Short Course

- Total course length = **24 hours** (1 unit = 2 hours)
- 12-week course = 2 hours of instruction per week
- 24-week course = 1 hour of instruction per week
- This option assumes that the teacher does not use the Student's Book video activities in class. Other sections of the Student's Book (e.g., Vocabulary Practice) are given as homework.

Longer Course

- Total course length = **48 hours** (1 unit = 4 hours)
- 12-week course = 4 hours of instruction per week
- 24-week course = 2 hours of instruction per week
- This option assumes that the teacher covers all Student's Book content in class. Lessons are often extended using supplementary worksheets from the *Reading Explorer* website.

Extended Course

- Total course length = **60 hours** (1 unit = 5 hours)
- 12-week course = 5 hours of instruction per week
- 24-week course = 2.5 hours of instruction per week
- This option assumes that the teacher covers all Student's Book content in class. Supplementary worksheets are used in each lesson. ExamView® quizzes are used regularly to monitor students' progress.

IMAGES OF LIFE

1



UNIT INTRODUCTION

This unit focuses on how technical advances have changed photographs over time and features an interview with world-famous photographer Annie Griffiths. In “The Visual Village,” students read about how advances in technology have changed the types of photos we take. In “My Journey in Photographs,” students read about Annie Griffiths’s journey to becoming the photographer she is today. In “A Photographer’s Life,” students will watch a video about Annie Griffiths’s career. Students will also read advice about how to take a selfie.

Visit the *Reading Explorer* website to download supplementary worksheets for this unit.

Key Words for Internet Research: *photographic techniques, amateur photography, photojournalist, the digital age, Annie Griffiths*

WARM UP

Answer Key

Possible answer(s):

1. I usually take selfies, and photos of my friends and the places we visit.
2. A photograph gives an accurate portrayal of a scene. It shows details, colors, and expressions on people’s faces and their actions.

TEACHING NOTES

Islam is the second largest religion in India, with 14.2 percent of the population identifying as Muslim. There are many mosques in New Delhi

providing worshippers a place of rest and peace in which to share quiet moments with friends and family.

- Read the Unit Title aloud as students look at the photo. Have students discuss how the photo relates to the title. Explain that *image* means a picture such as a photograph.
- Read the caption aloud and explain the meaning of *quiet moment* and *mosque*. In small groups, have students discuss how the photo shows a quiet moment.
- Have students discuss the questions with a partner, and follow up with a class discussion.

LESSON OVERVIEW

Target Vocabulary: *controversy, democracy, dramatic, embrace, instantly, obsessed, profound, relevant, represent, tremendous*

Reading Passage Summary: Advances in technology have made it possible for cameras to be a mainstream part of life. Most people nowadays carry a smartphone or other mobile device with a camera, making it possible to take a high-quality digital image and send it throughout the world in an instant. Anyone can publish their pictures by clicking “Post” on social media sites or personal blogs. These “citizen journalists” are often the first to respond to newsworthy events, providing photographs to the world that show the action as it is happening. Some people wonder how this new form of image-making will change us.

Answer Key

Before You Read

A. 1. document; **2.** amateur; **3.** photojournalist
B. b

Reading Comprehension

A. 1. d (Para D); **2.** a (Para E); **3.** c; **4.** b; **5.** d
B. 1. e; **2.** a; **3.** c; **4.** d; **5.** b

Reading Skill

A. 1. a; **2.** a; **3.** b; **4.** b; **5.** a; **6.** b
B. 1. a; **2.** a; **3.** a; **4.** b

Critical Thinking

Possible answer(s): **Pros:** Filters can show a more dramatic image to evoke a stronger reaction.

Cons: Filters can show a false reality. **Your opinion:** I think photojournalists should be allowed to use filters to an extent. I think dramatic images should be fact checked, or there should be some type of system in place where photographers are held accountable for fake images.

Vocabulary Practice

A. 1. dramatic; **2.** embrace; **3.** instantly;
4. obsessed; **5.** controversial
B. 1. b; **2.** a; **3.** a; **4.** b; **5.** a; **6.** b
C. 1. athletic, genetic; **2.** democratic; **3.** dramatic

Before You Read



A. Definitions: Have students read the paragraph and discuss the meanings of the words in bold. Then match the correct form of each word in bold with its definition (1–3). Ask students which word can be both a noun and a verb (*document*), and point out that it is used as a verb here.

B. Skimming: Have students skim paragraphs A and B, and choose the correct statement by circling a, b, or c. In pairs, have them explain why they think the author would agree with it. Have students check their answer as they read the passage.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 2: The author talks about how ordinary citizens provide the first images of an event and that the quality of these images is now less important than what is instantly shared.
- Question 3: Quotation marks draw attention to a word and can be used to show that the author does not agree with an accepted idea. In this case, the author questions whether a photo is really improved when it is altered.
- Question 5: Poetry is a creative way of using words, while writing a shopping list does not require much thought. The author means that some people will produce more imaginative work than others.

B. Main Idea: Have students skim each paragraph again and match it to its main idea (a–e). Check answers as a class.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Understanding Words with Multiple Meanings**. Model how to use a dictionary to find the different meanings (noun, verb) of the word *slip*.

A. Identifying Meaning: Have students scan paragraphs A–D again and think about the meanings of the words (1–6) in bold before choosing the correct meaning (a or b) for each. Have students check answers in pairs.

B. Analyzing: Have students think about the part of speech of the words in bold in the excerpts (1–4). Then have them choose the sentence (a or b) in which the underlined word has the same meaning as the word in bold. Have them compare answers in pairs, then check as a class.

Critical Thinking

Have students discuss the pros and cons of news photographers using filters, and give their opinion on whether it should be allowed or not. Students may discuss the fact that filters and other techniques create images that are not “reality.” By using filters, the colors and ambiance of a place can be changed. Ask pairs to note down their ideas, then present their opinions to the class.

Vocabulary Practice

A. Completion: This paragraph is about how photography has changed in recent years. Have students read the information first, then circle the correct words to complete the paragraph. Check answers as a class and then choose a volunteer to read the completed passage aloud to the class.

- Point out that *instantly* is an adverb, used here to describe the verb *share*, and the word *obsessed* collocates with the preposition *with*.

B. Words in Context: Have students circle the correct words to complete the definitions. The word *tremendous* can have two meanings: extremely large, or extremely good. In this passage, it means “extremely large.” Check answers as a class.

C. Word Forms: Refer to the word *democracy* in activity B and make sure students understand how the suffix *-tic* changes the noun to an adjective (*democratic*). Have students complete the sentences and check answers in pairs. Then ask students for the noun form of each word (*athlete*, *democracy*, *drama*, *gene*).

LESSON OVERVIEW

Target Vocabulary: *enrich, expectation, overcome, portrait, project, sincere, teamwork, thus, tuition, turn out*

Reading Passage Summary: Annie Griffiths is an award-winning photographer who started out as a waitress. She worked her way up through the years as a photographer for the *Minnesota Daily*, the *Worthington Daily Globe*, and finally *National Geographic*. Her interview gives an interesting insight into how her career has helped shape her view of the world.

Answer Key

Before You Read

A. 1. a; 2. c; 3. b; 4. e; 5. d

B. Possible answer(s): It is difficult to get the “right” photo so you’d have to be very patient and work odd hours. You might have to endure long journeys to find subjects to photograph.

Reading Comprehension

A. 1. b; 2. c (Para B); 3. a (Para C); 4. c (Para H); 5. d (Para J)

B. 1. b; 2. a; 3. a; 4. b; 5. b; 6. b

Reading Skill

A. 1. a; 2. c; 3. c; 4. b; 5. c

B. 1. a camera; 2. two years; 3. director of photography; 4. Bermuda; 5. She wanted her pictures to make a real difference in people’s lives.

Critical Thinking

- ▶ Possible answer(s): I think this means that women are an integral part of society. They are just as important as men. Without them, life couldn’t exist.
- ▶ Possible answer(s): Women take care of many things inside and outside of the home. They are smart and innovative. Women bear children and take care of them. They also have big ideas and are determined to improve their lives and their family’s.

Vocabulary Practice

- A. 1. project; 2. enrich; 3. portrait; 4. turns out; 5. thus**
- B. 1. overcome; 2. expectation; 3. sincere; 4. tuition; 5. teamwork; 6. enrich**
- C. Possible answer(s): hence, consequently, for this reason, therefore, so.**

TEACHING NOTES

Before You Read

A. Definitions: Have students read the expressions and think about the meanings before completing the activity. Check answers as a class.

B. Predicting: Have students discuss what a professional photographer does and what some of the challenges might be. Have students read the passage to check their ideas.

Reading Comprehension

A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 3: Make sure students understand that they should look for the sentence that does NOT describe Griffiths’s job. The correct answer is option “a,” as the article says she received “little or no instruction.”

B. Identifying Meaning: Remind students that they learned about understanding words with multiple meanings in the reading skill in Unit 1A. If necessary, have students turn back to that section of the Student’s Book and review this skill again. Have students scan “Lessons on the Road” to find the words (1–6) and choose the correct meaning (a or b) based on the context.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Scanning for Information (1)—Short Answer Questions**.

Level 4 *Reading Explorer* teaches students three different ways of scanning for information. The required approach depends on the question type. Make sure students understand that question words (*who*, *what*, *where*, *why*, *when*, *how*) are clues that help determine the type of answer needed. Remind them that *who* = person, *what* = thing, *where* = place, *why* = reason, and *how* = in what way.

A. Analyzing: Have students read the questions (1–5) and choose the type of answer they will need to scan for. Check answers in pairs.

B. Scanning: Have students use their answers from the previous activity to scan Reading B and write short answers to the questions (1–5) from activity A. Check answers as a class. Remind students that answers normally follow the order they appear in the text.

Critical Thinking

- ▶ Have students find the phrase “women really do hold up half the sky” in paragraph J, and discuss the meaning with a partner. Elicit answers as a class. Students may discuss the fact that there is a lot of inequality between men and women throughout the world. However, Griffiths has seen first-hand how important women are, and that they do very important things across the globe.
- ▶ Have students brainstorm examples to support the statement, then share their ideas with partner.

Vocabulary Practice

A. Completion: This paragraph is about what things to consider when taking a selfie. Direct students’ attention to the photo and caption next to activity A. Have students read the information first, then circle the correct words to complete the paragraph. Check answers as a class and then choose a volunteer to read the completed paragraph aloud to the class.

- Question 1: As a noun, a *project* (PRO-jekt) is a specific plan or piece of work to do. Here it is used as a verb (pro-JEKT) to mean display or show to an audience.

B. Definitions: Have students note the context in which these words are used in Reading B. Then have them match the words with the definitions and compare answers in pairs.

C. Word Web: Elicit that *thus* means “as a result or consequence of this.” Have students use a thesaurus to find synonyms if necessary. Some are more formal than others (more formal: *thus*, *hence*, *consequently*, *for this reason*, *therefore*; less formal: *so*). The more formal words are used mostly in writing or in professional situations. If time allows, have students write two sentences including *thus*, one formal and one informal. Then substitute their synonyms into the correct sentences to see if they still make sense.

Video Summary: Annie Griffiths, an award-winning photographer, talks about her career behind the camera and the importance of travel.

Key Vocabulary: *better, connections, different, listen, opportunity, people*

Answer Key

Before You Watch

A. Possible answer(s): **1.** I think Griffiths likes to take photos of people around the world enjoying their everyday lives. **2.** I think Griffiths wants to show people's unique lives, but also show that people all over the world are similar.

B. **1.** different; **2.** people; **3.** listen; **4.** connections; **5.** opportunity; **6.** better

While You Watch

A. See answers in Before You Watch B.

B. **1.** a; **2.** b; **3.** b; **4.** a

Critical Thinking

- ▶ Possible answer(s): world history
- ▶ Possible answer(s): I was inspired to study archeology when I learned about the ancient world.

B. Predicting: Have students read the extracts and predict which words are missing. Then have students compare with a partner. Remind students to use one word for each blank. Tell them not to worry if they do not know the answers; they will revisit this section after watching the video.

While You Watch

A. Gist: Play the video. Then have students check their answers to Before You Watch B. Ask whether their guesses are correct or similar to what Annie Griffiths says.

B. Multiple Choice: Have students answer the questions before watching the video again. Then play the video again and have students check answers in pairs.

Critical Thinking

- ▶ Have students think about a class or learning experience that affected them.
- ▶ In pairs, have students discuss how it affected or changed them. Share answers with the class.

Vocabulary Review

Have students work individually to check their understanding of the unit's target vocabulary. If time allows, have students write an example sentence with each word. Ask for volunteers to read their completed sentences aloud to the class.

Additional vocabulary practice questions are available for download on the *Reading Explorer* website.

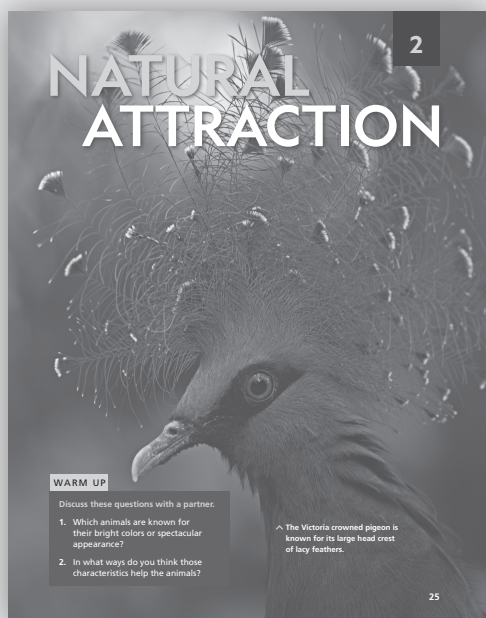
TEACHING NOTES

Before You Watch

A. Discussion: Ask students what they can remember about Annie Griffiths from Reading 1B, and brainstorm ideas. Have students look back at the photographs in Reading 1B and page 23 of the Student's Book and ask: *What do all these photographs have in common?* (They all have people in them.) *Do you think these photographs are all taken in the same country?* (No, they feature many different types of people.)

Have students discuss the questions with a partner. Then call on volunteers to share with the class.

NATURAL ATTRACTION



UNIT INTRODUCTION

This unit focuses on how some animals use their unique characteristics in their natural environments. In “Living Light,” students read about how organisms use their bioluminescence to survive and find a mate. In “Feathers of Love,” students read about why birds of paradise in Papua New Guinea have evolved in such an extraordinary way. In “Jellyfish,” students will watch a video about interesting characteristics of jellyfish. Students will also read about how other sea creatures use bioluminescence to survive, and the male Carola’s parotia bird of paradise’s interesting mating ritual.

Visit the *Reading Explorer* website to download supplementary worksheets for this unit.

Key Words for Internet Research: *bioluminescence, bahia bioluminiscente, dinoflagellates, bird of paradise, New Guinea*

WARM UP

Answer Key

Possible answer(s):

1. chameleons, poison dart frogs, blue morpho butterfly, scarlet macaw, toucan, lionfish, mandrill
2. The characteristics can help the animals survive through camouflage, or by scaring predators away.

TEACHING NOTES

The Victoria crowned pigeon is native to New Guinea, and is named for the elegant, blue, lace-like crest on its head. These birds are hunted

for their meat and beautiful feathers, and these factors—combined with the loss of their lowland forest habitat—are contributing to their decline. The bird is now listed as near threatened.

- Read the Unit Title aloud as students look at the photo. Have students discuss how the photo relates to the title. Help students make the connection that some animals have extraordinary features in order to attract mates.
- Read the caption aloud and explain the meaning of *is known for*. Have students say what things other animals are known for.
- Have students discuss the questions with a partner, and follow up with a class discussion.

LESSON OVERVIEW

Target Vocabulary: *astounding, countless, descend, disturb, factor, flash, invisible, layer, predator, transparent*

Reading Passage Summary: Bioluminescence is the ability some species have to create light and can be found in organisms both on land and in the ocean. Organisms use this ability in different ways: some use it as camouflage, others use it as a way to protect themselves or find food, and others use it as a way to attract mates.

Answer Key

Before You Read

- A.** Possible answer(s): fireflies, jellyfish, squid, some types of worms
B. Possible answer(s): for protection, to find prey, to attract a mate

Reading Comprehension

- A. 1.** b (Para A); **2.** c; **3.** c; **4.** b; **5.** d (Para G)
B. 1. NG; **2.** T; **3.** F (shrimp eat dinoflagellates); **4.** F (the canoe movement causes dinoflagellates to light up); **5.** NG

Reading Skill

- A. 1.** mate; **2.** upper; **3.** bellies; **4.** startle; **5.** escape; **6.** predator; **7.** dinoflagellates

Critical Thinking

Possible answer(s): I think puffin beaks might glow in the dark to attract prey. / I think puffins beaks glow to attract a mate in the breeding season. / I think the parent puffins have glowing beaks to direct the young chicks to the food in their beaks.

Vocabulary Practice

- A. 1.** astonishing; **2.** flash; **3.** predators; **4.** disturbed
B. 1. down; **2.** can; **3.** high; **4.** affects a result; **5.** warmer; **6.** cannot
C. 1. descend; **2.** ascend; **3.** crescendo; **4.** transcend

Before You Read



A. Discussion: Have students read the paragraph, and make a list of bioluminescent organisms that they may already know about. Make sure they understand the meaning of *emission* and *reaction*.

B. Predicting: Have students answer the question with a partner, then read the passage to check their ideas.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 3: The subject “these creatures” needs to be preceded by a reference to “these,” which is found in the third sentence (*many life forms*).
- Question 4: *Camouflage* means to hide by means of disguise, which is what the shrimp do when they match the light coming from above.

B. Evaluating Statements: Have students read each statement and choose T (true), F (false), or NG (not given), and then correct any false statements. Check answers as a class.

- Question 1: There is no mention of how many creatures live near the surface as opposed to deeper in the ocean.
- Question 5: There is no mention of which season visitors can see dinoflagellates in Vieques.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Summarizing (1)—Using a Concept Map**. Level 4 *Reading Explorer* teaches students two different ways of summarizing a reading passage. This first method is a useful way of taking notes using a concept map. Make sure students understand how a concept map is structured by pointing to the main topic in the middle, then the subtopics, and finally the supporting details.

A. Summarizing: Have students refer to Reading A to complete the concept map. Have students check answers in pairs.

Critical Thinking

Have students look back at the subtopics in the concept map before answering the question, giving reasons for their answer. Check answers as a class.

Vocabulary Practice

A. Completion: This passage is about how some sea creatures use bioluminescence. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then circle the correct words to complete the passage. Check answers as a class and then choose a volunteer to read the completed passage aloud to the class.

B. Words in Context: Have students circle the correct words to complete the definitions (1–6). Point out the affixes *-less*, and *in-* to help students understand the meaning of *countless* and *invisible*. Check answers as a class.

C. Word Roots: The prefix *cre-* means “grow” (*crescendo*) and *trans-* means “across” (*transcend*). Have students complete the sentences and check answers in pairs. If time allows, have students write a new sentence for each word.

LESSON OVERVIEW

Target Vocabulary: *absurd, bounce, breed, commence, evolution, harsh, noble, prominently, ritual, undergo*

Reading Passage Summary: Birds of paradise in Papua New Guinea have evolved in an extraordinary way. The males have magnificent plumes of colored feathers, which they show off in a series of dances in order to attract females. The birds have evolved in this way because of their unique environment with very few natural predators, which has allowed them to focus on attracting mates instead of finding ways to stay safe.

Answer Key

Before You Read

- A.** It is very colorful, with interesting patterns. It also has a very funny-looking tail!
B. a, b, d

Reading Comprehension

- A. 1.** b; **2.** c; **3.** a (Para K); **4.** c (Para K); **5.** d
B. 1. b; **2.** a; **3.** a; **4.** b; **5.** b

Reading Skill

- A. 1.** P, M; **2.** S; **3.** M, P; **4.** S; **5.** P, M
B. 1. as black as the night sky; **2.** some even have a dimmer switch; **3.** it would be like trying to swim through syrup; **4.** looking like meteors; **5.** the water is part of the sky, and you are paddling through the stars

Critical Thinking

- Possible answer(s): The writer is emphasizing
1. how dark the lower layers of the ocean are; **2.** how the creatures can adjust the brightness of their light; **3.** how difficult it is for dinoflagellates to swim quickly; **4.** how beautiful the streak of light from the fish is; **5.** that the dark sea looks like the night sky above, and the bioluminescent creatures in the water look like stars in the sky

- Possible answer(s): as wise as an owl, as bright as a lightbulb, like a whirlwind of energy, as fast as a lightning bolt

Vocabulary Practice

- A. 1.** ritual; **2.** prominent; **3.** bounces; **4.** absurd
B. 1. breed; **2.** commence; **3.** undergo; **4.** harsh; **5.** noble; **6.** evolution
C. 1. stability; **2.** reliable; **3.** hostile; **4.** mobility

TEACHING NOTES

Before You Read

A. Discussion: Have students look at the photo and describe what they see with a partner, then answer the question. Elicit answers from the class.

B. Skimming: Have students look at the reading titles and headings, then choose which options (a–d) they think will be covered in the passage. Have students read the passage to check their ideas.

Reading Comprehension

A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 4: Paragraph J describes how the people of New Guinea have for centuries been copying the birds' rituals, wearing the birds' feathers to copy their dances. Then in paragraph K, it states that local people are still permitted to hunt the birds for traditional use, inferring local people can hunt the birds to use the feathers to make traditional costumes.
- Question 5: Paragraph L talks about "threats," which are negative. The new sentence begins with *However*—a contrast to that. Paragraph M is positive, so it makes sense to start it with the new sentence.

B. Identifying Meaning: Remind students that they learned about identifying words with multiple meanings in the reading skill in Unit 1A. If necessary, have students turn back to that section of the Student's Book and review this skill. Have students scan the paragraphs to find the words and choose the correct meanings based on the context.

- Questions 1, 2, 5: The verbs *bows*, *row*, and *present* are pronounced differently from the noun forms. Here, *bows* is a verb, *row* is a noun, and *present* is a verb.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Identifying Figurative Language**. Figurative language is used to make writing more interesting, and it helps the reader better visualize what a person or thing looks like.

A. Identifying Figurative Language:

Personification can also be considered a type of metaphor, and therefore more than one answer is possible. Have students read the sentences from Reading B and choose the answers. Check answers in pairs.

- Sentence 1 refers to the human qualities of a performer. Sentences 3 and 5 mention the human quality of dancing.

B. Identifying Figurative Language: Have students look back at Reading A and underline the examples of figurative language (1–5) in the passage. Then have students check their answers with a partner.

Critical Thinking

- Have students look back at activity B, and discuss the meaning of each example with a partner. Discuss answers as a class.
- Have students brainstorm examples to describe someone they know, then share their ideas with a partner.

Vocabulary Practice

A. Completion: This paragraph is about the male Carola's parotia bird of paradise and its interesting mating ritual. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then use the correct form of the words in the box to complete the paragraph. Check answers as a class and then choose a volunteer to read the completed paragraph aloud to the class.

- Question 1: A *ritual* is a repeated action. Elicit some examples of *rituals* from the class. Possibilities include religious and traditional rituals as well as personal rituals, such as those of athletes before competing.
- Question 4: *Absurd* is an informal word which conveys a feeling of humor.

B. Definitions: Have students match the words in the box with the definitions (1–6), then compare answers in pairs.

- Question 2: *Commence* is more formal than *begin* and is more common in written English than spoken.
- Question 3: With *undergo*, elicit the past tense and the past participle (*underwent* / *undergone*), and give examples of common collocations such as *undergo treatment* / *therapy* / *surgery*.
- Question 5: *Noble* can mean a person is admirable, respectable, and morally good.

C. Word Forms: Have students complete the sentences (1–4) with the correct form of four of the words in the box. Remind them to add *-ility* to an adjective to form a noun after deleting the final *-e*. If time allows, have students write a new sentence for each word as a noun.

Video Summary: This video is about jellyfish. It gives facts and information about their behavior and their biological makeup.

Key Vocabulary: *clone, invertebrate, revert, venomous*

Answer Key

Before You Watch

A. 1. d; 2. c; 3. b; 4. a

While You Watch

A. a, c, e

B. 1. sea jellies; 2. polyp; 3. venomous; 4. water; 5. evaporate; 6. beaches

Critical Thinking

Possible answer(s): I think bioluminescence can help jellyfish attract prey. Since jellyfish are mostly transparent, I don't think they would need to use light as a form of camouflage.

TEACHING NOTES

Before You Watch

A. Previewing: Have students read the passage and match the words (1–4) with their definitions (a–d). Then have students compare answers with a partner. The prefix *in-* means “not,” so the opposite of an *invertebrate* is a *vertebrate*. The prefix *re-* means “again,” so *revert* means to change back.

While You Watch

A. Gist: Play the video. Then have students check the topics covered in the video. Have students compare answers in pairs.

B. Completion: Remind students they can use up to two words for each answer. Then play the video again and have students complete the notes individually, then check answers in pairs.

Critical Thinking

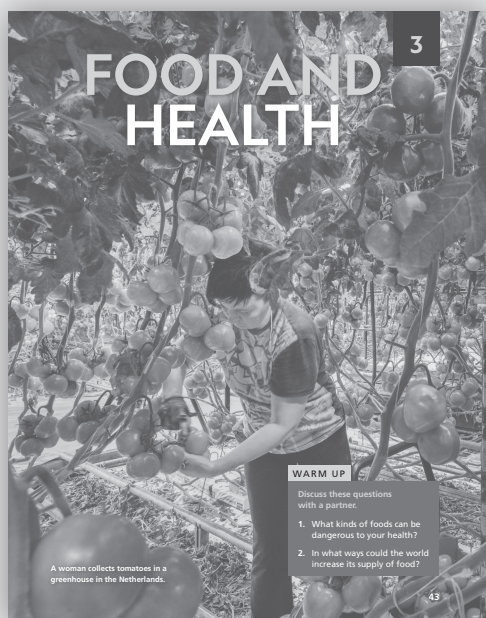
Have students look back at the infographic on page 30 and think about how jellyfish might use bioluminescence. Have them discuss their ideas with a partner.

Vocabulary Review

Have students work individually to check their understanding of the unit's target vocabulary. If time allows, have students write an example sentence with each word. Ask for volunteers to read their completed sentences aloud to the class.

Additional vocabulary practice questions are available for download on the *Reading Explorer* website.

FOOD AND HEALTH



UNIT INTRODUCTION

This unit focuses on food safety and health. In “How Safe Is Our Food?” students read about different ways the risk of foodborne illness can be reduced. In “The Battle for Biotech,” students read about the benefits and risks of genetically modified foods, with clear arguments from experts on both sides of the issue. In “Is Our Food Safe?” students will watch a video about foodborne illness. Students will also read about a salmonella scare in the United States in 2008, and a study that showed the benefits of using genetically engineered (GE) rice seed in China.

Visit the *Reading Explorer* website to download supplementary worksheets for this unit.

Key Words for Internet Research: *foodborne disease, E.coli, CDC, salmonella, PulseNet, genetic engineering, biotech foods, GE crops*

WARM UP

Answer Key

Possible answer(s):

1. food that isn't cleaned or prepared properly; foods that are high in fat and sugar
2. by finding ways to grow crops in more diverse areas; by teaching more people to farm their land; by genetically modifying more crops to be disease-resistant

TEACHING NOTES

Growing tomatoes in a greenhouse can extend the harvest season by several months due to the warm temperatures and near perfect growing conditions.

In addition, a greenhouse protects the tomatoes against too much rain, which can cause a type of fungal disease.

- Read the Unit Title aloud as students look at the photo. Have students discuss how the photo relates to the title. Discuss how we make decisions about what kind of food we choose to eat.
- Read the caption aloud and explain the meaning of *greenhouse*. Have students say why growers might prefer a greenhouse instead of growing crops in a field.
- Have students discuss the questions with a partner, and follow up with a class discussion.

LESSON OVERVIEW

Target Vocabulary: *compulsory, confine, contaminate, determine, digestion, feasible, infect, integral, nationwide, optimistic*

Reading Passage Summary: Although food-related illnesses can be deadly, there is much that can be done to help reduce the risk of sicknesses. By improving sanitary conditions and changing the way farm animals are raised, the risk of coming into contact with dangerous bacteria can be decreased.

Answer Key

Before You Read

- A. 1.** sanitary; **2.** bacteria; **3.** immune systems; **4.** foodborne
- B.** Possible answer(s): Food and water contaminated with bad bacteria such as *E.coli* and *salmonella* cause food poisoning. To avoid this, we can wash all fruit and vegetables, cook food enough to kill bacteria, and keep food preparation areas clean.

Reading Comprehension

- A. 1.** c; **2.** d; **3.** a (Para F); **4.** a (Para H); **5.** b (Para I)
- B. 1.** NG; **2.** T; **3.** T; **4.** F (the mangoes were washed in contaminated water); **5.** T

Reading Skill

- A. 1.** I forgot about the appointment; **2.** The medicine in our cabinet was old; **3.** I had a stomachache; **4.** new health guidelines; **5.** improper hand washing
- B. 1.** c (Para C); **2.** e (Para D); **3.** b (Para G); **4.** d (Para H); **5.** a (Para I and Para J)

Critical Thinking

- ▶ fruits and vegetables; chickens
- ▶ Possible answer(s): employing these methods might be expensive; farmers need to be taught about these methods, and there might be cultural and language barriers that prevent them from understanding the information.

Vocabulary Practice

- A. 1.** compulsory; **2.** integral; **3.** nationwide; **4.** determined; **5.** contaminated; **6.** infection
- B. 1.** a; **2.** b; **3.** a; **4.** b
- C. 1.** nation; **2.** city; **3.** world

Before You Read



A. Definitions: Have students read the paragraph, and match the words with their definitions (1–4). Then have students compare with a partner.

B. Predicting: Make sure students understand what it means to have food poisoning. Have students answer the question with a partner, then read the passage to check their ideas.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 2: The singular form of *bacteria* is *bacterium*.
- Question 3: Scientists needed to match types of bacteria in order to link cases together.
- Question 5: A *model* is someone or something that others can copy and aim to be like.

B. Evaluating Statements: Have students read each statement and choose T (true), F (false), or NG (not given), then correct any false statements. Check answers as a class.

- Question 1: There is no mention of where people first got sick.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Recognizing Cause and Effect Relationships (1)**. Level 4 *Reading Explorer* teaches students three different ways of recognizing cause and effect. With this first look, explain to students the difference between a cause and an effect. A cause is an action or a condition that makes something happen. An effect is a result of that action. The cause and effect relationship might be indicated by words such as *caused*, *as a result of*, *because (of)*, *so*, *due to*, *thus*, and *the reason*; or it may be implied without using these words. Advise students to ask the following questions when trying to determine a cause and effect relationship: *What is the cause?* (the action that makes something happen) and *What is the effect?* (the result of the action).

A. Analyzing: Have students read the sentences (1–5) and underline the cause in each one. Have students check answers in pairs.

B. Matching: Remind students how to determine a cause and effect relationship by asking *What is the cause?* and *What is the effect?* Have students match the causes (1–5) with the effects (a–e) quoting the relevant paragraph references. Check answers as a class.

Critical Thinking

- Have students look back at the reading passage before answering the questions. Check answers as a class.
- Have students think about the challenges each approach might pose. Discuss answers as a class.

Vocabulary Practice

A. Definitions: This paragraph is about a salmonella scare in 2008. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then match each word in red with its definition.

- Question 2: the root *integ-* means *entire*. Other words with this prefix include *integrate* and *disintegrate*.

B. Words in Context: Have students complete the sentences (1–4) with the correct word or phrase (a or b). Check answers as a class.

C. Word Parts: The suffix *-wide* changes a noun to an adjective and is usually used to refer to a location: The problem happens around the *world* (noun). It is a *worldwide* (adjective) problem. Have students complete the sentences and check answers in pairs.

LESSON OVERVIEW

Target Vocabulary: *allergic, alternative, conventional, deficiency, diminish, modify, notwithstanding, nutritional, revolution, trait*

Reading Passage Summary: Genetic alteration has existed for thousands of years, but recent developments in technology have allowed us to create biotech foods using new ways of genetic engineering. Many scientists say genetically altering our food is safe, and that the known benefits far outweigh the potential risks. However, critics disagree.

Answer Key

Before You Read

- A.** Possible answer(s): biotech foods might cause health issues in humans and dangers to the environment
- B.** 1. biotech foods appear to be safe or even safer than conventional varieties; 2. people have mixed opinions; 3. although there are skeptics, many scientists think so

Reading Comprehension

- A.** 1. b; 2. d (Para C); 3. a (Para D); 4. d; 5. a
- B.** 1. b; 2. d; 3. c

Reading Skill

- A.** Possible answer(s): **Arguments for:** good history, safe for humans, environmental benefits, increased crops; **Arguments against:** unexpected consequences, environmental risks, unproven benefits
- B.** 1. thousands; 2. higher risk; 3. natural; 4. chemical; 5. unexpected health effects; 6. adequately tested

Critical Thinking

- Possible answer(s): **Evidence for:** good history: problems have been few; safe for humans: potential to improve the quality and nutritional value, safer than conventional

varieties; environmental benefits: may actually be good for the land; increased crops: can help address the urgent problems of food shortage and hunger; **Evidence against:** unexpected consequences: rushed to market, harmful proteins; environmental risks: developed too quickly and released before they've been adequately tested; unproven benefits: the benefits of golden rice have been exaggerated

- Possible answer(s): I eat genetically modified food in the conventional sense. For example, I choose the biggest, juiciest tomatoes at the market, and I know these have been genetically modified over thousands of years. But I don't like the idea of genetically modified food in which rat genes are inserted into vegetables, for example, because I don't feel the health effects are fully known.

Vocabulary Practice

- A.** 1. modified; 2. revolution; 3. allergic; 4. notwithstanding
- B.** 1. good; 2. a choice; 3. little; 4. the usual; 5. size; 6. smaller
- C.** 1. decline; 2. lessen; 3. reduce; 4. fade

TEACHING NOTES

Before You Read

A. Discussion: Have students read the paragraph individually and think about the question. In groups, have students make a list before discussing answers as a class.

B. Predicting: In pairs, have students ask and answer the questions. Encourage them to expand on their answers and give reasons for their opinions. Have pairs locate the question headings in the text and then read individually to find the answers.

Reading Comprehension

A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 1: “To show both sides” means to point out different views on an issue.
- Question 3: Paragraph D mentions that scientists have linked fumonisins with cancer in animals. This is relevant because of the idea it could also cause cancer in humans.

B. Matching: Have students refer to the reading passage to match each crop (1–3) with an effect (a–c), then check answers with a partner. Remind students that one effect is extra.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Evaluating Arguments**. Information for and against an idea are also called *pros and cons*, or *advantages and disadvantages*. It is important to understand the writer’s purpose for writing before determining his or her argument. A useful way of evaluating a writer’s argument is to present the information for and against in a T-chart.

A. Analyzing: Have students look back at Reading B and find arguments for and against biotech foods. Then have students check answers in pairs.

B. Completion: Have students complete the chart by using words or phrases from Reading B. Then compare their answers with a partner.

Critical Thinking

- Have students look back at the chart and find supporting evidence in the reading for each argument. Check answers as a class.
- Have students answer the question, then share their ideas with partner. Note: several countries ban genetically modified food, while in other countries, companies are required to label it.

Vocabulary Practice

A. Completion: This passage is about GE rice seed in China that has reduced pesticide use by 80 percent. Direct students’ attention to the photo and caption next to activity A. Have students read the information first, then use the correct form of the words to complete the passage. Check answers as a class and then choose a volunteer to read the completed passage aloud to the class.

- Question 4: Note that *notwithstanding* means *despite*: *Despite such fears and concerns, proven examples . . .*

B. Words in Context: Have students circle the correct words to complete the definitions (1–6), then compare answers in pairs.

C. Word Usage: *Diminish* means “make or become less.” Have students choose the correct word in bold to complete the sentences (1–4). Remind students to use a dictionary or thesaurus if necessary. If time allows, have students use a thesaurus to find other synonyms, such as *deplete*, *dwindle*, and *lower*. Ask students to write new sentences using the synonyms they find.



Video Summary: This video is about food poisoning. It gives facts and information about how many people get sick every year and tells about an E. coli outbreak in Germany in 2011.

Key Vocabulary: *globalization, hard to tell, unreported*

Answer Key

Before You Watch

A. Possible answer(s): Food can be contaminated when it's being grown; for example, if dirty water is used or if the conditions aren't sanitary. Food can also be contaminated when it's being prepared if the kitchen isn't clean or if the food isn't heated or stored properly. Contaminated food can make us vomit or cause a fever.

B. 1. globalization; 2. hard to tell; 3. unreported

While You Watch

A. a, c

B. 1. 128,000; 2. 3,000; 3. 3,000; 4. sprouts; 5. 53; 6. 15

Critical Thinking

Possible answer(s): 1. 3 (some chemical pesticides are necessary to rid crops of toxins); 2. 5 (this could hold restaurants more accountable); 3. 3 (the risks might be similar in both environments)

TEACHING NOTES

Before You Watch

A. Discussion: Have students answer the questions and share their ideas with a partner.

B. Previewing: Have students read the paragraph and match the words in bold with their definitions (1–3). Then have students compare answers with a partner. The expression *hard to tell* is informal and means “not easy to know the truth.”

While You Watch

A. Main Ideas: Play the video. Then have students check the ideas mentioned in the video. Have students check answers in pairs.

B. Completion: Have students complete the notes before watching the video again. Then play the video again and have students check answers in pairs.

Critical Thinking

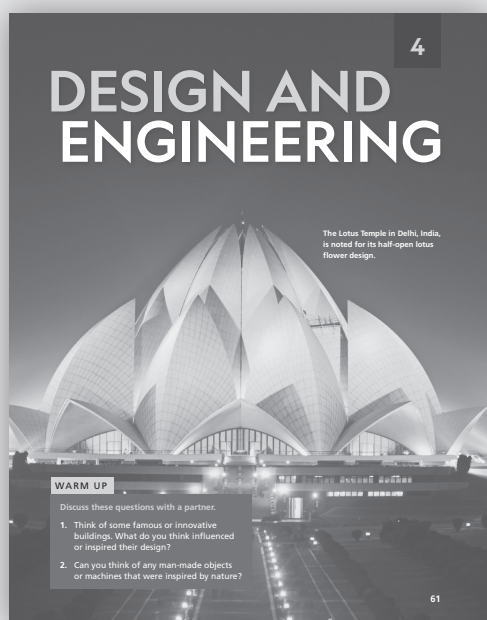
Have students read the statements, and circle how strongly they agree (1 = strongly disagree; 5 = strongly agree). Have them discuss their answers with a partner, giving reasons for their opinions.

Vocabulary Review

Have students work individually to check their understanding of the unit's target vocabulary. If time allows, have students write an example sentence with each word. Ask for volunteers to read their completed sentences aloud to the class.

Additional vocabulary practice questions are available for download on the *Reading Explorer* website.

DESIGN AND ENGINEERING



UNIT INTRODUCTION

This unit focuses on how both natural and synthetic materials can be used to solve problems and create new designs. In “Design by Nature: Biomimetics,” students read about how the natural world provides inspiration for biomimetics. In “Weaving the Future,” students read about how high-tech products stimulate the minds of fashion designers across the globe. In “Robotic Hands,” students will watch a video about a new type of robot used in the ocean. Students will also read about a building inspired by termites, and how an artist temporarily changes outdoor spaces.

Visit the *Reading Explorer* website to download supplementary worksheets for this unit.

Key Words for Internet Research: *biomimetics, Stickybot, Velcro, high-tech textiles, wearable electronics*

WARM UP

Answer Key

Possible answer(s):

1. Sydney Opera House, Taj Mahal, Burj Khalifa, The Guggenheim, the Pompidou Center, The Gherkin, One World Trade Center, Casa Milà; the architects might have been inspired by nature, height, or vastness.
2. a water filter based on rocks, a wind turbine based on humpback whales, Velcro, a device for harvesting water based on a beetle

comprises 27 independent marble “petals,” clustered into groups of three. The top of the building appears to be open, but in fact it is a glass and steel roof that allows natural daylight to pour through.

- Read the Unit Title aloud as students look at the photo. Have students discuss how the photo relates to the title. Discuss how *design* and *engineering* are necessary factors in building an innovative building such as this one.
- Read the caption aloud and explain the meaning of *temple* and *lotus*. Have students say how the building resembles a lotus flower.
- Have students discuss the questions with a partner, and follow up with a class discussion.

TEACHING NOTES

The Lotus Temple is a nine-sided marble building, set in 26 acres of gardens in New Delhi. It

LESSON OVERVIEW

Target Vocabulary: *biological, device, fund, gap, gradually, insight, nonetheless, phase, vertical, vital*

Reading Passage Summary: Biomimetics, the science that looks at how to apply designs from nature to try and solve problems, is an innovative and exciting field. Scientists around the world are trying to replicate nature's designs, in order to solve problems that we encounter every day.

Answer Key

Before You Read

- A.** 1. draw inspiration; 2. incredibly complex; 3. have the potential; 4. specific purpose
B. 1. a biologist who studied the thorny devil; 2. The thorny devil lizard has the ability to get water to travel from its foot across its body and into its mouth to drink. 3. make a device to help people collect water in the desert

Reading Comprehension

- A.** 1. b (Para A); 2. c (Para E); 3. a; 4. a (Para G); 5. d

- B.** 1. d; 2. a; 3. b; 4. c

Reading Skill

- A.** 1. b; 2. c; 3. a

- B.** 1. B; 2. F; 3. G; 4. H

Critical Thinking

Possible answer(s): beavers that have waterproof fur: a type of coat that can keep you dry and warm in freezing waters.

Vocabulary Practice

- A.** 1. nonetheless; 2. insight; 3. gaps; 4. vertical; 5. gradually

- B.** 1. b; 2. a; 3. b; 4. b; 5. a

- C.** 1. importance; 2. absolutely; 3. role

Before You Read



A. Definitions: Have students read the paragraph, paying attention to the words in bold. Then have students read through the definitions and write the correct phrase next to 1–4. Note that *have the potential (to)* and *draw inspiration (from)* both begin with a verb. Point out the prepositions *to* and *from* that follow the phrases. Check answers as a class.

B. Skimming: Remind students that *skimming* means to look very quickly for the main idea. Have students read the questions (1–3) and then skim the first paragraph to find the answers. Check answers as a class.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 3: Note that “things” is a reference to certain natural abilities of a fly, which Fearing believes are too complicated to replicate in a robot.
- Question 4: *Limitation* means something it is not able to do.
- Question 5: Option “d” is not true because Velcro is cited as the only famous product of biomimetics.

B. Matching: Have students read each application (1–4) and match it with an animal trait that inspired it (a–d). Check answers as a class.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Scanning for Information (2)—Matching Information to Paragraphs**. Remind students that they have already learned about this concept. With this type of exam question students will need to match information in the form of reasons, examples, descriptions, etc. to particular paragraphs in the text. Students need to read the statements and identify key words or phrases. The exact words may not be used in the passage so students may need to think of synonyms or antonyms. Make sure students understand the difference between a reason, a prediction, and a contrast, and elicit words they might be able to scan for with each.

A. Matching: Have students read the sentences 1–3 and match each one with the type of information it contains (a–c). The words *will*, *unlike*, and *reason* are key clues. Have students check answers in pairs.

B. Scanning: Have students scan the reading for the information, using the words *definition*, *prediction*, *reason*, and *example* as clues. Check answers as a class.

Critical Thinking

Have students look at the animal attributes and answer the question in a group. Have groups share answers with the class.

Vocabulary Practice

A. Completion: This paragraph is about a building designed using biomimicry. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then circle the correct words to complete the paragraph. Check answers as a class and then choose a volunteer to read the completed paragraph aloud to the class.

- Question 1: *Nonetheless* signals a contrast in ideas. Other synonyms are *however*, *nevertheless*, *even so*, *but*, *still*, *yet*, and *though*.
- Question 2: Note the full expression *have an insight (into something)*.

B. Words in Context: Have students complete the definitions with the correct phrase (a or b). Check answers as a class.

- Question 3: Elicit that *device* is a formal word to mean “thing” or “tool.”

C. Collocations: Other words that mean the same as *vital* are *essential* and *imperative*. Elicit other words that mean the same as *vital*: *critical*, *crucial*, *key*, *indispensable*, *integral*, *urgent*, *high-priority*. Have students complete the sentences and check answers in pairs. Remind students that one word is extra. If time allows, have students write a new sentence for each word with *vital*. Ask students to substitute the synonyms above to see if their sentences still make sense.

LESSON OVERVIEW

Target Vocabulary: *appliance, fantasy, foresee, forthcoming, fraction, manufacturing, portable, rigid, suspend, thereby*

Reading Passage Summary: With the advent of synthetic fibers, anything is possible! New innovative clothing designs are being thought up by creative people around the world and researchers are even using synthetic textiles to design and construct portable buildings. Some of these high-tech ideas draw their inspiration from nature and are being designed to help make our lives easier.

Answer Key

Before You Read

- A. 1.** Textiles; **2.** fiber; **3.** Synthetic
B. Possible answer(s): waterproof clothing, wearable electronics, invisibility uniforms

Reading Comprehension

- A. 1.** b; **2.** c (Para D); **3.** a; **4.** c; **5.** a
B. 1. E; **2.** B; **3.** K; **4.** F; **5.** A

Reading Skill

- A. 1.** A; **2.** SU; **3.** RF; **4.** A; **5.** RP
B. 1. active; **2.** smart; **3.** smart apron; **4.** invisible; **5.** innovators

Critical Thinking

Possible answer(s): to monitor your blood sugar if you have diabetes; to measure calories; to check your vital signs

Vocabulary Practice

- A. 1.** thereby; **2.** suspended; **3.** rigid; **4.** fantasy
B. 1. portable; **2.** fraction; **3.** appliance; **4.** foresee; **5.** forthcoming; **6.** manufacturing
C. 1. cast; **2.** sight; **3.** front

TEACHING NOTES

Before You Read



A. Definitions: Have students read the caption individually and use the words in bold to complete the definitions (1–3). Check answers as a class.

B. Predicting: Have students answer the question and then discuss with a partner. Have students read the passage to check their ideas.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 2: Students need to infer a connection between absorbing vibrations and a reduction in sound. The writer includes a direct quote from Vinchon to make us feel Vinchon's excitement.
- Question 3: Alex Soza is a fashion designer whose unique ideas come to him in dreams so he would therefore be the most likely to come up with the idea of "a coat made of paper with six sleeves."

B. Scanning: Remind students that they learned about scanning for information (matching information questions) in the reading skill in Unit 4A. If necessary, have students turn back to that section of the Student's Book and review this skill. Have students find the information in the reading passage and note the paragraph letter (A–K) each item appears in. Then check answers in pairs.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Recognizing Lexical Cohesion**. Writers use lexical cohesion to make their writing more interesting. Make sure students understand the meaning of each technique, and give additional examples if necessary.

A. Recognizing Lexical Cohesion: Have students read the sentences from Reading B and note down the correct example of lexical cohesion for each item (1–5). Check answers as a class.

B. Recognizing Lexical Cohesion: Have students look back at Reading B to find the examples of lexical cohesion. Then check answers in pairs.

Critical Thinking

Have students think of possible future applications of wearable electronics, then share their ideas with a partner. Have pairs agree on an application and design it on paper to share with the class. Ask students to vote for the most useful and innovative idea.

Vocabulary Practice

A. Completion: This paragraph is about how the artist Christo uses man-made material to change outdoor spaces. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then complete the paragraph with words from the box. Check answers as a class and then choose a volunteer to read the completed paragraph aloud to the class.

- Question 4: The phrase *turn fantasies into realities* is a common expression used when people are successful at something they have always wanted.

B. Definitions: Have students match the words to the definitions, then compare answers in pairs.

C. Word Parts: The prefix *fore-* means “before” and *foresee* means “to see into the future.” Have students complete the sentences and share answers with a partner.

- If time allows, have students think of a prefix that is an antonym of *fore-*. Elicit the prefix *post-* and point out the following words: *postpone* (arrange for something to take place after the scheduled time), *postdate* (assign a date after the actual one), *postgraduate* (a student pursuing studies for a more advanced qualification after getting one degree), *posthumous* (occurring after death). Note also the prefix *back*, which forms an antonym of *foreground* (*background*).

Video Summary: This video shows marine biologist David Gruber and roboticist Robert Wood talking about their new robot that they developed to help study ocean life.

Key Vocabulary: *coral, fragile, genome, grab*

Answer Key

Before You Watch

A. 1. d; 2. c; 3. a; 4. b

B. Possible answer(s): This robot looks much softer. The bristles are curved, which would cause less damage to marine life.

While You Watch

A. a, b

B. 1. T; 2. T; 3. F; 4. F; 5. T

Critical Thinking

- ▶ Possible answer(s): a worm can regenerate when it gets cut in half; a chameleon can change color to show its mood; a seahorse's tail can grasp objects with amazing strength
- ▶ Possible answer(s): scientists could study how a seahorse's tail works to invent a prosthetic arm for humans

TEACHING NOTES

Before You Watch

A. Previewing: Have students read the paragraph and match the words (1–4) with their definitions (a–d). Then have students compare with a partner.

B. Discussion: Have students look at the photo and read the caption before answering the question. Have students discuss their ideas with a partner.

While You Watch

A. Gist: Play the video. Then have students check the two things shown in the video. Have students check answers in pairs.

B. Evaluating Statements: Have students read the statements and choose T (true) or F (false) before watching the video again. Then play the video again and have students check answers in pairs.

Critical Thinking

- ▶ Have students work in small groups to answer the question. Remind them to think of interesting characteristics of both plants and animals.
- ▶ Have students choose one of their ideas and say what a practical use might be. Share answers with the class.

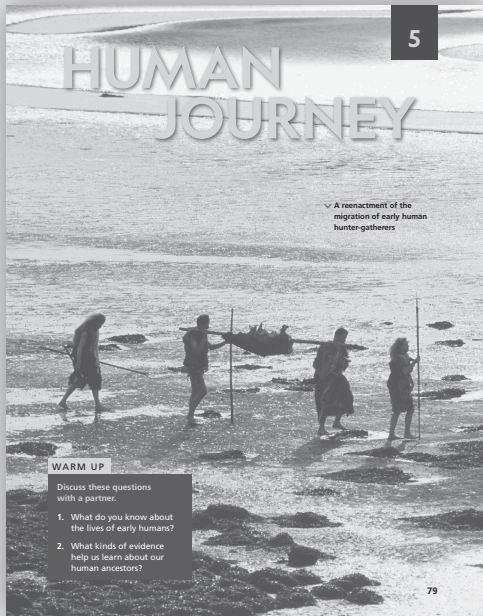
Vocabulary Review

Have students work individually to check their understanding of the unit's target vocabulary. If time allows, have students write an example sentence with each word. Ask for volunteers to read their completed sentences aloud to the class.

Additional vocabulary practice questions are available for download on the *Reading Explorer* website.

HUMAN JOURNEY

5



UNIT INTRODUCTION

This unit focuses on extraordinary journeys humans have made over time. In “The DNA Trail,” students read about the human migration to other continents over many thousands of years. In “Fantastic Voyage,” students read about the voyage of people across the Pacific around 3,000 years ago. In “Cave Artists,” students will watch a video about ancient cave art. Students will also read about Neanderthals, and a new theory about how the first people arrived in the Americas.

Visit the *Reading Explorer* website to download supplementary worksheets for this unit.

Key Words for Internet Research: *Neanderthal, DNA, human migration, ancestry, chromosomes, genetics, Lapita, Polynesians, El Niño*

WARM UP

Answer Key

Possible answer(s):

1. All humans today can be traced back to Africa; they migrated in waves throughout the world over many thousands of years.
2. DNA; archeological evidence such as bones and man-made items such as tools; mummified bodies preserved in snow.

TEACHING NOTES

Although we might look similar today to our ancestors from tens of thousands of years ago, our lives are very different now. The great human journey spans 200,000 years and started in

Africa, before spreading out to other continents over time.

- Read the Unit Title aloud as students look at the photo. Have students discuss how the picture relates to the title. Ask: “What do you think *human journey* refers to?” (Human evolution, and how people came to inhabit all parts of the globe.)
- Read the caption aloud and explain the meaning of *migration* and *hunter-gatherers*. Have students give reasons why our ancestors might have migrated, and how that ties into the word *journey*. Explain the meaning of *reenactment*, pointing out that although the photo is not real, it is based on history.
- Have students discuss the questions with a partner and follow up with a class discussion.

LESSON OVERVIEW

Target Vocabulary: *bulk, calculate, descendant, identical, immense, rate, roughly, scattered, trace, vanish*

Reading Passage Summary: Who are we? Where did we come from? Recent DNA technology has taught us that we are all descendants of a single woman who lived about 150,000 years ago in Africa. From there the journey began, and evidence suggests that humans migrated from Africa to Asia, and finally to all other parts of the world over the next tens of thousands of years.

Answer Key

Before You Read

- A. 1.** Africa; **2.** South America; **3.** Asia; **4.** Europe
B. genetic mutations; archeological evidence; genetic traces in the DNA of indigenous people

Reading Comprehension

- A. 1.** c; **2.** a; **3.** b (Para G); **4.** a; **5.** d
B. 1. d; **2.** c; **3.** e; **4.** b; **5.** a

Reading Skill

- A. 1.** arrow pointing toward the migration date of *200,000 years ago*; **2.** arrow pointing toward the migration date of *70,000–50,000 years ago*; **3.** arrow pointing to the migration route heading toward Australia; **4.** arrow pointing toward *Lake Mungo, Australia*; **5.** arrow pointing toward the migration date of *20,000–15,000 years ago*
B. 1. It gives an alternative theory by stating that Europe might have been settled by an inland migration from India instead of directly from the Middle East. **2.** The “broad human prehistoric framework” that Forster refers to is the same thing as the “basic outlines of a story of human migration” mentioned in paragraph K. **3.** Possible answer(s): Genetic traces of the group that made the 13,000-kilometer migration from Africa to Australia exist in the DNA of indigenous peoples of Malaysia, Papua New Guinea, and

nearly all Australian aborigines. Archeological evidence has also been found at Lake Mungo, Australia, supporting this genetic link.

Critical Thinking

- Possible answer(s): jobs, love, education
 ► Possible answer(s): **Positive effects:** people bring money and diversity to the new economy; **Negative effects:** the job market in the new economy becomes more competitive, and local people have a harder time finding work

Vocabulary Practice

- A. 1.** roughly; **2.** calculate; **3.** scattered; **4.** immense; **5.** bulk; **6.** vanished
B. 1. bulk; **2.** identical; **3.** trace; **4.** descendant; **5.** rate
C. 1. unemployment; **2.** success; **3.** steady; **4.** alarming

Before You Read



A. Understanding Maps: Ask students to look at the map in pairs and take turns pointing to and naming the six continents shown. Have them study the “years ago” numbers in red, in order to notice the sequence of events. Then have students complete the sentences with the name of a continent. Check answers as a class.

B. Skimming: Have students skim the passage for the kinds of evidence scientists are looking for, then compare their ideas with a partner.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 3: Note that the word *split* in paragraph G means “divided.”

- Question 4: Note that *imperceptible* means it is impossible to notice with our senses. The word *percept* can be seen in *imperceptible* and like *impossible*, the *im* means it cannot be *perceived* or cannot be *noticed* or is *unnoticeable*.
- Question 5: In paragraph J, the phrases *Most scientists believe* (sentence 4) and *Perhaps they* (sentence 6) signal a theory and not a fact in reference to option “d.”

B. Recognizing Lexical Cohesion: Remind students that they learned about recognizing lexical cohesion in the reading skill in Unit 4A. If necessary, have students turn back to that section of the Student’s Book and review this skill. Have students read each sentence (1–5) and match the pair of underlined words with a type of lexical cohesion (a–e). Check answers as a class.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Synthesizing Information**. Point out that visuals such as photos and maps can often illustrate information from the reading passage and that photo captions and sidebars also support ideas in the text. Connecting this information from the text and these features is called synthesizing and can help students better understand the passage.

A. Synthesizing: Have students read the paraphrased sentences from Reading A and then label the parts of the map on page 82 that are being referenced (1–5).

B. Synthesizing: Have students read the sidebar “Alternative Routes?” on page 83 and answer the questions with a partner. Elicit answers from the class.

Critical Thinking

- Have students read the question, note down their ideas, then share with a partner.
- Have students consider positive and negative effects of human migration, and then share answers with the class.

Vocabulary Practice

A. Completion: This paragraph is about Neanderthals. Direct students’ attention to the photo and caption next to activity A. Have students read the information first, then complete the paragraph. Remind students that four words are extra. Check answers as a class and then choose a volunteer to read the completed paragraph aloud to the class.

- Question 1: *Roughly* means “not exactly.” Other synonyms include *approximately*, *about*, *in the range of*.
- Question 3: *Scattered* means “spread out.”

B. Definitions: Have students match the definitions (1–5) with the correct word. Check answers as a class.

C. Collocations: The word *rate* refers to a measure, quantity, or frequency of something. Have students complete the sentences (1–4), then check answers in pairs. If time allows, have students write a new sentence for each collocation.

LESSON OVERVIEW

Target Vocabulary: *analogous, clue, disrupt, horizon, intact, interval, navigation, phenomenon, stretch, stubborn*

Reading Passage Summary: Around 3,000 years ago, people set out on extraordinary adventures across the Pacific Ocean and began to colonize the many islands along their route. Two amazing civilizations were responsible—the Lapita and the Polynesians. Anthropologists are now coming up with new theories about how these pioneers navigated such unbelievable distances without the use of modern technology.

Answer Key

Before You Read

A. Possible answer(s): **1.** They may have been searching for food. They may have been adventurers. **2.** They might have followed stars or sea creatures, or seen smoke from distant lands.

B. Students' own answers

Reading Comprehension

A. 1. a; **2.** b; **3.** c (Para H); **4.** b (Para H); **5.** a

B. 1. T; **2.** F (The Lapita sailed as far east as Samoa and Tonga); **3.** T; **4.** NG; **5.** F (They reached South America by A.D. 1000)

Reading Skill

A. 1. F; **2.** F; **3.** S; **4.** S; **5.** S

B. 1. S (It is also possible ...); **2.** F; **3.** S (Scientists believe ...); **4.** F

Critical Thinking

- Possible answer(s): Astronauts want to explore space. Divers want to explore the oceans.
- Possible answer(s): No, I don't think I would like to join an expedition to another planet. I think the risks are too high, and there's enough to see here on Earth!

Vocabulary Practice

- A. 1.** stretched; **2.** intervals; **3.** navigated;
4. clues; **5.** disrupts
B. 1. is observable; **2.** similar; **3.** complete;
4. earth and sky; **5.** difficult
C. 1. famous; **2.** continuous; **3.** courageous

TEACHING NOTES

Before You Read

A. Discussion: Have students look at the picture and read the caption. Make sure they understand the meaning of *descendants* and *exploring*. Have students answer the questions and share their ideas with a partner.

B. Scanning: Have students scan the reading passage to check their predictions in activity A.

Reading Comprehension

A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 5: Something *over the horizon* is not visible, but it exists. People with curiosity and adventurous spirits would wonder what more there was to see beyond their current environment.

B. Understanding Maps: Have students look back at the map on pages 90–91 and decide if the information in the statements (1–5) is true (T), false (F), or not given (NG). Elicit answers from the class.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Distinguishing Fact from Speculation**. Writers use speculation (or theory) when their ideas cannot be proven, and words such as *suggest*, *may*, *might*, and *possibly* soften their assertion. Knowing the difference between fact and speculation means students will be better able to evaluate the information and ideas in the reading passage.

A. Fact or Speculation: Have students read the sentences from Reading B and decide whether they are fact (F) or speculation (S). Remind them to look for key words such as *believe*, *think*, *hypothesize*, *suggest*, *may*, *might*, *possibly*, *likely*, and *perhaps* as stated in the Reading Skill paragraph. Have student check answers in pairs.

B. Fact or Speculation: Have students look back at Reading B to find the information (1–4) and state whether each one is fact or speculation, circling the words in the passage that indicate the speculations. Elicit answers from the class.

Critical Thinking

- Remind students of the paraphrase to Irwin's comment in Reading Comprehension Question 5: *The Lapita were motivated by a curiosity about new places*, then think of other kinds of expeditions or explorations today with similar motives. Have students note their ideas and share with a partner.
- Have students answer the question and share their opinion with a partner.

Vocabulary Practice

A. Completion: This passage is about new theories regarding the migration path of the first people in the Americas. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then circle the correct words to complete the passage. Check answers as a class and then choose a volunteer to read the completed passage aloud to the class.

B. Words in Context: Have students circle the correct words to complete the sentences (1–5) and then compare answers in pairs.

C. Word Parts: The suffix *-ous* changes a word into an adjective. Have students complete the sentences (1–3) and share answers with a partner. If time allows, have students write a new sentence for each word.

Video Summary: This video is about cave art. It gives facts and information about the history of cave art and why it might have been created.

Key Vocabulary: *depict, engrave, pigment, predominantly*

Answer Key

Before You Watch

A. 1. c; 2. d; 3. a; 4. b

B. Possible answer(s): to tell stories; to create art; for religious purposes

While You Watch

A. a, b, d, f

B. 1. Spain; 2. 40,000; 3. Ice; 4. black; 5. communication

Critical Thinking

Yes, I think it's worth the time and effort because it teaches us more about our ancestors. By learning about them, we can understand more about ourselves.

While You Watch

A. Gist: Play the video. Then have students check the questions that are answered in the video. Have students check answers in pairs.

B. Completion: Have students read and complete the notes before watching the video again. Then play the video again and have students check answers in pairs.

Critical Thinking

Have students read the question and discuss their ideas with a partner. Suggest they make a chart of pros and cons to help them decide if studying early human migration and ancient cave art is worth the time and effort or not.

Vocabulary Review

Have students work individually to check their understanding of the unit's target vocabulary. If time allows, have students write an example sentence with each word. Ask for volunteers to read their completed sentences aloud to the class.

Additional vocabulary practice questions are available for download on the *Reading Explorer* website.

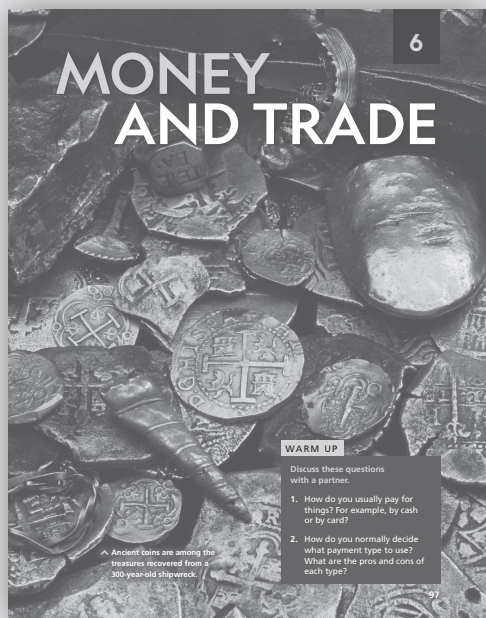
TEACHING NOTES

Before You Watch

A. Previewing: Have students read the paragraph and match the words (1–4) with their definitions (a–d). Then have students compare answers with a partner.

B. Discussion: Have students answer the question and then discuss their ideas with a partner.

MONEY AND TRADE



UNIT INTRODUCTION

This unit focuses on how money is used around the world. In “How Money Made Us Modern,” students read about the history of money and how it’s changed over time. In “The Rise of Virtual Money,” students read about Bitcoin and the pros and cons of virtual currency. In “Take the Money... and Run?,” students will watch a video about people’s reaction to free money. Students will also read about how Sweden is soon to be a cashless society, and how Bitcoin may have ancient origins.

Visit the *Reading Explorer* website to download supplementary worksheets for this unit.

Key Words for Internet Research: *representation of value, currency, economic system, virtual currency, Bitcoin, cryptography, Silk Road, Satoshi Nakamoto*

WARM UP

Answer Key

Possible answer(s):

1. I usually pay for things by card. I don’t usually carry cash around.
2. It depends on the amount, but I usually pay by card. I think it’s more convenient, and there’s always a paper trail in case you need to refer to the transaction. I don’t carry a lot of cash because I don’t want to lose it. It’s easier to replace a lost credit card.

TEACHING NOTES

Ancient coins look different from the coins we use today. In the past, the value of money was

determined by the metal that was used to make the coin. Coins were not all uniform. Rather, they all had a slightly different shape and size and had different values.

- Read the Unit Title aloud as students look at the photo. Have students discuss how money is related to trade, both in the past and today. Have students make a list of synonyms for the word *trade* (barter, swap, exchange, buy).
- Read the caption aloud and ask students how these 300-year-old objects are different from the money we use today.
- Have students discuss the questions with a partner. Follow up with a class discussion.

LESSON OVERVIEW

Target Vocabulary: *commodity, convenience, essentially, judgment, payment, policy, signify, stable, transaction, trigger*

Reading Passage Summary: Since ancient times, humans have had economic systems to represent the value of objects in their societies. Some systems used commodity money—the value of the currency is fixed by the metal within it. Modern systems, like ours today, use fiat money—the value of the currency is fixed by the government. Today we use a variety of methods of payment, ranging from cash to credit cards to virtual currency, which may just be the way of the future.

Cons: people might run up debt more easily; there might be more cases of identity theft.

- Possible answer(s): I think the types of transactions to go cashless first will be in places like busy sandwich shops with a high volume of customers. Payments made with cards or phones could speed-up transactions and reduce queues.

Vocabulary Practice

- A.** 1. payment; 2. convenience; 3. transactions; 4. policy; 5. judged; 6. trigger
B. 1. fairly constant; 2. oil and natural gas; 3. nodding your head; 4. basically
C. 1. strict; 2. insurance; 3. company; 4. public

Answer Key

Before You Read

- A.** 1. Inflation; 2. Foreign exchange; 3. credit card; 4. bill
B. Possible answer(s): I think people used coins and objects like shells and bird feathers in ancient times. They also bartered and exchanged goods.

Reading Comprehension

- A.** 1. b; 2. d (Para A); 3. c (Para H); 4. c (Para J); 5. a (Para M)
B. Commodity Money: a, c, e, f;
Fiat Money: b, d, g

Reading Skill

- A.** 1. Naming; 2. Quoting; 3. Defining; 4. Reporting; 5. Cause-Effect; 6. Condition
B. Naming: In 2009, yet another high-tech successor to money emerged: Bitcoin.
Defining: Bitcoins are a sort of unofficial virtual Internet currency. **Quoting:** Parag Khanna, a financial policy expert, explains: "The real future is technology as money. That's what Bitcoin is about."

Critical Thinking

- Possible answer(s): **Pros:** all transactions can be traceable; there is less risk of losing money;

Before You Read



A. Definitions: Have students read the money-related words in the box and note which ones they already know. Use the words to complete the definitions (1–4). Check answers as a class.

B. Predicting: Have students answer the question and share their ideas with a partner before reading the passage to check their ideas.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 2: Although the writer says that the pieces were made of baked clay, there is no mention as to why the clay was heated.

B. Classifying: Have students find the definitions of *commodity* and *fiat* in the passage, then read each characteristic (a–g), and match it to the correct column. Check answers as a class.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Understanding the Function of Sentences**. By knowing the function of a sentence, the reader can better understand why the writer wrote the text and how it is organized.

A. Understanding Function: Have students read the sentences and use the functions in the Reading Skill box to help write the function of each sentence. Check answers in pairs.

B. Understanding Function: Have students read paragraph M in Reading A and underline sentences that match three functions listed in the Reading Skill box. Check answers as a class.

Critical Thinking

- ▶ Have students think about why a country might “go cashless” and then note some pros and cons for a country to do this. Share their ideas with a partner.
- ▶ Have students name types of transactions or activities that would likely go cashless first. Have them share ideas with a partner, giving reasons for their answers.

Vocabulary Practice

A. Completion: This paragraph is about how Sweden will soon become a cashless society. Direct students’ attention to the photo and caption next to activity A. Have students read the information first, then use the words in the box to complete the paragraph. Check answers as a class and then choose a volunteer to read the completed paragraph aloud to the class.

B. Words in Context: Have students complete the definitions with the correct word or phrase. Check answers as a class.

C. Collocations: The word *policy* refers to a course of action proposed by a government, company, or individual. Have students complete the sentences with the correct words and then check answers in pairs. If time allows, have students write a new sentence for each word.

LESSON OVERVIEW

Target Vocabulary: *asset, drawback, drug, fraud, principle, scarce, sophisticated, stocks, supposedly, verify*

Reading Passage Summary: Bitcoin is a decentralized virtual currency, which means it is not controlled by a central bank or government. As a cryptocurrency, it uses secure coding to enable transactions and is operated on a blockchain—a global network of computers that record all its transactions. Although Bitcoin has had a short and turbulent history, it and other virtual currencies may be the way of the future.

Answer Key

Before You Read

A. 1. years; **2.** trillion; **3.** 11

B. Possible answer(s): Virtual currency is a type of digital currency that is accepted electronically; it can be very unstable, but it's easy to make international money transfers for lower fees

Reading Comprehension

A. 1. c; **2.** b; **3.** c; **4.** c; **5.** a

B. 1. T; **2.** NG; **3.** F (One Satoshi is a fraction of a Bitcoin.); **4.** T; **5.** T; **6.** NG

Reading Skill

A. 1. bank; **2.** electronically; **3.** coding; **4.** blockchain; **5.** 2009; **6.** drugs; **7.** Silk Road

B. Possible answer(s): **What is Bitcoin?:** eight decimal places → smallest is “Satoshi”; users solve math problems to “mine” → get paid → trade mined Bitcoins; **What are benefits of Bitcoin?:** speedy transactions, no payment delays; can make payment without PayPal or credit card; no need for bank account; **What are the drawbacks?:** lack of stability

Critical Thinking

Possible answer(s): No, I wouldn't. I would be too concerned about the fluctuation and stability of the currency.

Vocabulary Practice

A. 1. sophisticated; **2.** principles; **3.** scarce; **4.** verify; **5.** drawback

B. 1. in their body; **2.** may have; **3.** go to jail; **4.** own; **5.** part of a company

C. 1. principal; **2.** principle; **3.** principal

TEACHING NOTES

Before You Read

A. Quiz: Have students read the questions and choose what they think is the best answer. The answers are on page 114. Students should not worry if they do not get them correct.

B. Predicting: Have students read the introduction to the passage and answer the questions before sharing their ideas with a partner. Have them check their ideas by reading the passage.

Reading Comprehension

A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 5: A supersonic jet plane is a very advanced form of transportation. According to paragraph 1, Bitcoin is compared to an early model vehicle. Therefore, more sophisticated forms of virtual currency will likely appear in the future.

B. Evaluating Statements: Have students read the statements and decide if the information is true (T), false (F), or not given (NG). Then have them check answers with a partner, correcting any false statements.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Summarizing (2)—Creating an Outline**. Remind students that they have already learned about this concept in Unit 2A. An outline is a way for readers to easily see how a passage is organized, and it helps highlight the main ideas and supporting details of a text. Have students notice the use of roman numerals, capital letters and numbers in the outline in activity A.

A. Outlining: Have students refer to paragraphs A–F in Reading B and highlight the most important information. Then have students complete the outline with words, phrases, or numbers from the passage. Check answers in pairs.

B. Outlining: Have students find the most important information in paragraphs G–N of Reading B and create an outline of their own. Then have students compare their answers with a partner.

Critical Thinking

Have students think about the pros and cons of being paid in Bitcoin and then answer the questions. Have pairs discuss their ideas, giving reasons.

Vocabulary Practice

A. Completion: This passage is about the history of cryptocurrencies. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then use the words in the box to complete the passage. Check answers as a class and then choose a volunteer to read the completed passage aloud to the class.

B. Words in Context: Have students circle the correct words to complete the sentences and then compare answers in pairs.

C. Word Usage: The word *principal* ends in *-pal*, which means “friend.” Students can use this to help them remember which word means the person in charge of a school. Have students complete the sentences and share answers with a partner. If time allows, have students write a new sentence for each word.



Video Summary: This video shows the results of an experiment designed to find out how people will react if they are offered free money.

Key Vocabulary: *catch, innate, in a flash, no-strings-attached*

Answer Key

Before You Watch

A. 1. catch; 2. in a flash; 3. innate;
4. no-strings-attached

While You Watch

A. c

B. Possible answer(s): 1. offered people free money; 2. took the money; 3. booth / cash / money; 4. took the money very quickly;
5. a giant pair of eyes; 6. Most people did not take the money.

Critical Thinking

- Possible answer(s): I think I would have reacted the same way the majority of people in the video did.
- Possible answer(s): Yes, I think so, because different cultures have different ideas about community. For example, some cultures expect to share their wealth more evenly, so the idea of "free" money might not be so strange.

TEACHING NOTES

Before You Watch

A. Previewing: Direct student's attention to the photo and caption. Have students read the quotes and match the bold words with their definitions (1–4). Then have students compare answers with a partner.

While You Watch

A. Main Idea: Play the video. Then have students choose the main result of the experiment. Have students check answers in pairs.

B. Completion: Have students read and complete the notes before watching the video again. Play the video again and have students check answers in pairs.

Critical Thinking

- Have students think about how they would have reacted at each stage of the experiment. Have them note their ideas then share with a partner.
- Have students answer the questions with a partner. Elicit answers from the class.

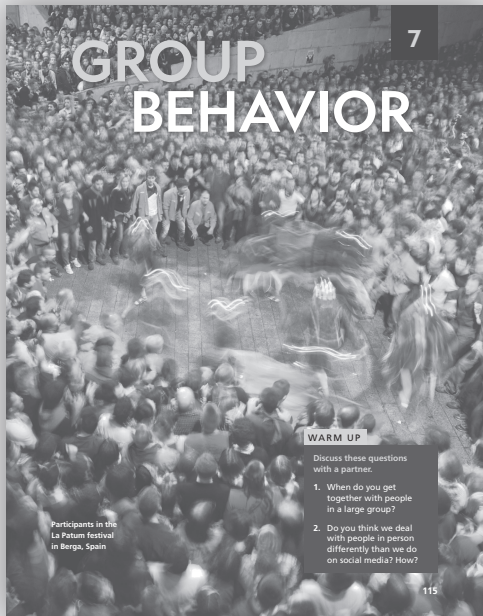
Vocabulary Review

Have students work individually to check their understanding of the unit's target vocabulary. If time allows, have students write an example sentence with each word. Ask for volunteers to read their completed sentences aloud to the class.

Additional vocabulary practice questions are available for download on the *Reading Explorer* website.

GROUP BEHAVIOR

7



UNIT INTRODUCTION

This unit focuses on people's behavior. In "A Crowd in Harmony," students read about how people behave in large groups at a festival. In "Our Online Behavior," students read about how an evolutionary anthropologist explains our hostility online. In "Social Conformity," students will watch a video about an experiment designed to test how easily people conform. Students will also read about the popularity of religious tourism, and how a woman started an anti-bullying campaign after being bullied.

Visit the *Reading Explorer* website to download supplementary worksheets for this unit.

Key Words for Internet Research: *Kumbh Mela festival, crowd psychology, online behavior, online aggression*

WARM UP

Answer Key

Possible answer(s):

1. at festivals in my town, birthday parties, national events, concerts
2. Yes, I think we are kinder to people we meet in real life. Also, non-verbal communication is important, and you can't have eye contact or get other social cues online.

TEACHING NOTES

La Patum festival takes place every year during Corpus Christi in a town near Barcelona and has been celebrated for centuries. Townspeople dress

up as mythical figures and participate in a series of dances. In 2005, the festival was declared a Masterpiece of the Oral and Intangible Heritage of Humanity by UNESCO.

Read the Unit Title aloud as students look at the photo. Have students discuss how the picture relates to the title and say how they think the people in the crowd are interacting together.

Read the caption aloud and explain the meaning of *participants*. Have students say whether they think all the people are participating in some way, or just the dancers in the center.

Have students discuss the questions with a partner and follow up with a class discussion.

LESSON OVERVIEW

Target Vocabulary: *evident, faith, harmony, organized, participant, progress, prospective, sacred, society, suspect*

Reading Passage Summary: The Kumbh Mela festival brings tens of millions of Hindu pilgrims together at the Ganges River in India. The festival is incredibly well run, and people are respectful and positive towards each other. Research shows that a ritual or tradition in a large group is healthy and can make people feel more connected to their communities.

Answer Key

Before You Read

- A.** 1. Pilgrims; 2. overcrowded; 3. bathe
B. Possible answer(s): I think people who take part in this festival feel part of a bigger community, which has a positive effect on their health and well-being.

Reading Comprehension

- A.** 1. c; 2. d (Para C); 3. c; 4. a (Para F); 5. d
B. 1. long afterward; 2. shared identity; 3. psychological crowd; 4. station safer

Reading Skill

- A.** 1. b; 2. c; 3. a; 4. c; 5. c
B. 1. holy / sacred / devout; 2. push, around; 3. breaks down; 4. deter

Critical Thinking

- ▶ Possible answer(s): The pilgrims reported a 10 percent improvement in their health; less pain; less anxiety; higher energy levels.
- ▶ Possible answer(s): The effects of taking time off work or school can be very positive. Work and school are very demanding, and any break from a stressful situation will improve your health.

Vocabulary Practice

- A.** 1. organized; 2. participants; 3. sacred; 4. prospective

- B.** 1. moves onward; 2. clear; 3. community; 4. connect; 5. believe; 6. great
C. 1. Participants; 2. occupant(s); 3. servants; 4. descendants

Before You Read



A. Definitions: Have students look at the photo and read the caption, then complete the definitions (1–3). Note the long *a* sound in *bathe* is different from the short *a* sound in *bath*. Have students check answers in pairs.

B. Predicting: Have students answer the question then discuss answers in pairs. Have students skim through the passage quickly to check their ideas.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 2: Paragraph C says *every year* and then states that the festival is especially large every 12 years.
- Question 3: Note that *critical to* (something) means “necessary,” and *criticize* (something) means to say you do not like it.

B. Cause and Effect: Remind students that they learned about recognizing cause-and-effect relationships in the reading skill in Unit 3A. If necessary, have students turn back to that section of the Student’s Book and review this skill. Have students complete each sentence with two words from the passage. Check answers as a class.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Understanding Words from Context**. Context can be part of speech, synonyms, antonyms, or examples in the text that give clues about a word's meaning. Make sure students understand how to use context to guess the meaning of words.

A. Words in Context: Have students scan the first two paragraphs in Reading A for the words in bold. Use the context to choose the best definition (a, b, or c) for each. Check answers in pairs.

B. Words in Context: Have students find words or phrases in Reading A that match the definitions (1–4). Elicit answers as a class.

B. Words in Context: Have students complete the definitions by circling the correct words. Check answers as a class.

- Question 1: Point out that *progress* here is a verb, but it can also be a noun—*People made great progress*.
- Question 2: Note the noun form, *evidence*.

C. Word Forms: The suffix *-ant* means “doing or performing” something or “characterized by or serving” something. Have students complete the sentences and check answers in pairs. If time allows, have students write a new sentence for each noun form of the verbs in the box.

Critical Thinking

- ▶ Have students find and underline evidence in the passage to support the claim that being in a crowd makes people healthier.
- ▶ Have students give their opinion on whether they agree with the claim by considering the three bulleted points. Have them share their ideas with a partner and then ask pairs to report their opinions to the class in a class discussion.

Vocabulary Practice

A. Completion: This passage is about the popularity of religious tourism. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then use the correct form of the words in the box to complete the information. Check answers as a class then choose a volunteer to read the completed passage aloud to the class.

- Question 1: Elicit the noun and verb forms of *organized*—*organization* (n.) and *to organize* (v.).
- Question 4: Point out *prospective* is used with people—*prospective student*, but can also refer to an event that is likely to happen—*prospective job*.

LESSON OVERVIEW

Target Vocabulary: *aggression, collaborate, confront, contemporary, division, harassment, humanity, insult, pressure, substantial*

Reading Passage Summary: There is growing aggression on social media, and people seem to be more cruel today than ever before. The Internet is an anonymous place where nasty and aggressive behavior can go unpunished. Researcher Agustín Fuentes looks deeper into the issue of whether social media is really to blame for our hostility online.

Answer Key

Before You Read

- A.** Possible answer(s): **1.** Yes, but only on my friends' posts. I comment on their photos and on their opinions. **2.** Yes, I've seen a lot more bullying online in the past few years.
- B.** Possible answer(s): I think the best thing to do is delete a negative comment on something I posted. If someone else has posted something negative, I usually just ignore it.

Reading Comprehension

- A.** **1.** b; **2.** c (Para C); **3.** b; **4.** d; **5.** b
- B.** **1.** anonymity; **2.** cooperation; **3.** neurobiology; **4.** online sources; **5.** online aggression

Reading Skill

- A. Prefix only:** unfriend, unlock, Internet;
Suffix only: apeline, successful, bitterness, global; **Both prefix and suffix:** interaction, expression, transformation; **Neither prefix nor suffix:** solo, argue

- B.** **1.** nat, e; **2.** tain, d; **3.** equ, a; **4.** vis, b;
5. temp, c

Critical Thinking

- Possible answer(s): make your friend aware that his or her online behavior seems aggressive; calmly discuss your different views with your colleague; block the stranger from having access to your accounts

- Possible answer(s): Yes, e.g., a group of people could all report the stranger to the social media site and get that person's account deleted.

Vocabulary Practice

- A.** **1.** insulted; **2.** harassment; **3.** confront; **4.** aggressive; **5.** humanity
- B.** **1.** a; **2.** a; **3.** b; **4.** b; **5.** b
- C.** **1.** financial; **2.** coming under; **3.** get away from; **4.** constant

TEACHING NOTES

Before You Read

A. Discussion: Have students read the questions and discuss their answers with a partner. Discuss answers as a class.

B. Predicting: Have students note down ideas, discuss various approaches with a partner, and then read the passage to check the writer's opinion.

Reading Comprehension

A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 2: Paragraph C states that Fuentes is an evolutionary anthropologist, which is the study of the evolution of human physiology and behavior.

B. Completion: Have students complete the sentences with words and phrases from the box. Remind students that one option is extra. A *shouting match* is when people scream in anger at each other. Have students check answers with a partner. If time allows, have students write a new sentence for each word.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Understanding Word Roots and Affixes**. A prefix is added to the beginning of a word and a suffix is added to the end. Affixes can be added to change a word's part of speech or meaning. By building their knowledge of affixes and common word roots, students will greatly increase their vocabulary.

A. Understanding Affixes: Have students add the words to the correct column in the chart. Remind them that some words have both a prefix and a suffix, and other words have neither. Check answers as a class.

B. Understanding Word Roots: Have students underline the common root in each word set (1–5), then match it with its meaning (a–e). Check answers with a partner.

Critical Thinking

- ▶ Have students read the problems and note down ways to deal with them. Then have students discuss their ideas with a partner.
- ▶ Have students answer the question and then explain their ideas to a partner.

Vocabulary Practice

A. Completion: This passage is about how a woman who was bullied started an anti-bullying campaign. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then circle the correct words to complete the passage. Choose a volunteer to read the completed passage aloud to the class.

B. Words in Context: Have students complete the sentences (1–5) with the correct answer (a or b), then compare answers in pairs.

C. Collocations: *Pressure* is the use of persuasion, influence, or intimidation to make someone do something. Have students circle the correct word to complete the sentences (1–4), and share answers with a partner. If time allows, have students write a new sentence for each of the collocations in 1–4 that were not used.



Video Summary: This video shows the results of an experiment designed to test whether a woman in a crowded waiting room would conform to strange group behavior.

Key Vocabulary: *peer pressure, socialized, test subject*

Answer Key

Before You Watch

A. 1. b; 2. a; 3. c

B. Possible answer(s): Sometimes when one of my friends changes her hairstyle, other people change theirs as well; I noticed that a few of my co-workers became vegetarians, and soon many other people followed the trend.

While You Watch

A. b

B. 1. eye doctor; 2. stand up; 3. doesn't ask; 4. three; 5. continues to conform; 6. shows; 7. conform to the rules of the previous group

Critical Thinking

- ▶ Possible answer(s): I think I would have asked someone why they were standing up. I don't think I would have conformed.
- ▶ I'm surprised that the woman stood up even after the other people left the room! I can't believe that people would conform so quickly and easily.

While You Watch

A. Gist: Play the video. Then have students choose the main purpose of the experiment.

B. Completion: Have students choose the correct words to complete the summary. Then play the video again and have students check answers in pairs.

Critical Thinking

- ▶ Have students answer the questions and then discuss their idea with a partner.
- ▶ Have students think about the people's behavior in the video. Then have them answer the question and share their ideas with a partner.

Vocabulary Review

Have students work individually to check their understanding of the unit's target vocabulary. If time allows, have students write an example sentence with each word. Ask for volunteers to read their completed sentences aloud to the class.

Additional vocabulary practice questions are available for download on the *Reading Explorer* website.

TEACHING NOTES

Before You Watch

A. Previewing: Have students read the paragraph and match the words (1–3) with their definitions (a–c). Then have students compare answers with a partner.

B. Discussion: Have students answer the question and discuss their ideas with a partner. Elicit ideas from the class.

INVESTIGATIONS



UNIT INTRODUCTION

This unit focuses on crimes and investigations and looks at ways in which crimes are committed. In “Who Killed the Emperor?” students read five theories about how Napoleon Bonaparte died. In “In the Crime Lab,” students meet Marcella and Alphonse, who work together to investigate suspicious deaths in the U.S. state of Virginia. In “Beating a Lie Detector,” students will watch a video about how to score well on a polygraph. Students will also read about fugu, a poisonous fish, and how arsenic was a popular method of poisoning in the past.

Visit the *Reading Explorer* website to download supplementary worksheets for this unit.

Key Words for Internet Research: *Napoleon Bonaparte’s death, chief medical examiner, director of toxicology, pathology, forensics*

WARM UP



Answer Key

Possible answer(s):

1. DNA testing, blood splatter patterns, fingerprint analysis, crime reports
2. Two girls disappeared in my town about 30 years ago, and the case has never been solved. They were walking home from school one afternoon and were never seen again.

TEACHING NOTES

Crime scene investigators are the people who document a crime scene. They use technical and scientific methods to collect evidence such as fingerprints, footprints, tire tracks, blood, and other

body fluids, hairs, and fibers. The evidence is then put together to paint a bigger picture of what must have happened.

- Read the Unit Title aloud as students look at the photo. Make sure they understand that an *investigation* is a search. Have students discuss how the picture relates to the title and say what the man is doing.
- Read the caption aloud and explain the meaning of *technical* and *scientific*. Have students discuss what technical and scientific skills they think the man in the photo needs.
- Have students discuss the questions with a partner and follow up with a class discussion.

LESSON OVERVIEW

Target Vocabulary: *cease, compelling, dispute, grand, inconclusive, plot, poison, relentlessly, revenge, symptom*

Reading Passage Summary: The French Emperor Napoleon Bonaparte was sent away to an island as a prisoner, where he died in 1821. There are many theories surrounding how and why he died, ranging from disease to murder. Some seem more plausible than others.

Answer Key

Before You Read

- A. 1.** present; **2.** Cancer; **3.** prisoner
B. Possible answer(s): **Political Murder?:** Was Napoleon killed by the British and the French royalists? **Poisoned by His Wallpaper?:** Did the wallpaper in his house contain arsenic? **Doctors' Mistake?:** Did the doctor give him too large a dose of medicine? **Disease?:** Did Napoleon have cancer? **A Case of Revenge?:** Was he murdered due to his actions?

Reading Comprehension

- A. 1.** d; **2.** a (Para C); **3.** c (Para D); **4.** b (Paras D and F); **5.** d (Para H)
B. 1. F; **2.** S (Para C: *In his view*); **3.** F; **4.** S (Para E: *it is likely*); **5.** S (Para F: *Karch theorizes*); **6.** S (Para H: *there were rumors*); **7.** F

Reading Skill

- A. 1.** a; **2.** a, b; **3.** a; **4.** a; **5.** a, b
B. Possible answer(s): I think Napoleon must have been murdered, but the circumstances surrounding the murder are too vague to be sure. I read that there was arsenic found in his hair sample, but as we read in other paragraphs, the arsenic could have come from the wallpaper or from the seafood he ate. / Although some of the evidence is speculation, I think Napoleon was accidentally poisoned by arsenic. It's a known fact that his wallpaper contained arsenic.

Critical Thinking

- Possible answer(s): He means that because people like the stories so much, they would probably ignore any new facts found in a new investigation.
- Possible answer(s): think; we could possibly learn more about history if we used modern techniques to analyze the remains.

Vocabulary Practice

- A. 1.** poisonous; **2.** cease; **3.** Symptoms; **4.** compelling; **5.** dispute
B. 1. large and impressive; **2.** not clear; **3.** in secret; **4.** never seems to stop; **5.** wronged
C. 1. bitter disputes; **2.** A dispute over; **3.** in dispute; **4.** beyond dispute

Before You Read



A. Definitions: Ask students to read the caption individually and think about what types of words are in bold. Then have students complete the sentences with the correct form of the word. Check answers as a class.

B. Predicting: Have students read the five headlines individually. Then have pairs discuss what kind of information they might find under each heading. Have students skim through the passage quickly to check their ideas.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 1: Remind students about the headings they discussed in Before You Read. Point out that there is no definitive answer for the cause of Napoleon's death, only theories.

- Question 5: François de Candé-Montholon is proud to say that he is an aristocrat and that his ancestor did it. This sounds as though he is looking in his past to find events that make his family sound more interesting and important.

B. Fact or Speculation: Remind students that they learned about distinguishing fact from speculation in the reading skill in Unit 5B. If necessary, have students turn back to that section of the Student's Book and review this skill. Have students find the information (1–7) in the passage and write F (fact) or S (speculation), then circle the words in the passage that indicate speculation. Check answers as a class.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Evaluating Evidence**. Make sure students understand that when weighing up one or more theories on a topic they need to look for evidence given in the passage. Facts, examples, and expert opinions can be presented as evidence. Students need to look for evidence that supports each theory and then ask the questions given in the Reading Skill box.

A. Evaluating Evidence: Have students read each theory in paragraphs C to H, then choose the evidence (1–5) to support it. Remind them that more than one answer is possible. Check answers in pairs.

B. Evaluating Evidence: Have pairs look back at Reading A and decide which theory is best supported with evidence and then share their ideas with the class.

Critical Thinking

- Have students find the quote in the passage (paragraph J) and note down their ideas, then share with a partner.
- Have students complete the sentence giving reasons for their choice, then share it with a partner. Elicit answers from the class.

Vocabulary Practice

A. Completion: This passage is about fugu, a type of poisonous fish. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then use the correct form of the words in the box to complete the passage. Check answers as a class and then choose a volunteer to read the completed passage aloud to the class.

- Question 2: Point out that *cease* is followed by a gerund (*-ing* verb).
- Question 3: Note that *symptoms* is followed by the preposition *of* and refers to something bad. (One symptom of global warming is rising sea levels.)

B. Words in Context: Have students complete the definitions with the correct words or phrases. Check answers as a class.

- Question 1: *Grand* is a formal word and not often used in spoken English.
- Question 2: Elicit the prefix *in-* (not) and word root *conclude* (end). Point out that the suffix *-ive* makes *inconclusive* an adjective.

C. Collocations: The word *dispute* means a disagreement, argument, or debate. Have students complete the sentences and check answers in pairs. If time allows, have students write a new sentence for each collocation.

LESSON OVERVIEW

Target Vocabulary: *allegation, candidate, deprived of, evaluate, frankly, in terms of, manipulative, remorse, suspicious, weird*

Reading Passage Summary: Meet Marcella Fierro and Alphonse Poklis, two colleagues who analyze medical evidence in homicide cases. This interview gives an insight into what they do, and discusses the technology they use to detect poisons and other toxic substances.

Answer Key

Before You Read

A. 1. b; 2. c; 3. a

B. b, c, d

Reading Comprehension

A. 1. a; 2. d (Para B); 3. b (Para D); 4. c (Para F);
5. d (Para G)

B. 1. c; 2. b; 3. d; 4. f; 5. a

Reading Skill

A. 1. b; 2. c; 3. d; 4. a; 5. e

B. 1. a; 2. c; 3. c; 4. a; 5. b

Critical Thinking

- Possible answer(s): He did not think they were good people. He called them *controlling, sneaky, scary, manipulative*, and said they have no conscience, sorrow, or remorse. These are all very negative traits.
- Possible answer(s): I agree with Poklis because a person who poisons someone has to think about it for a long time, then plan out how to do it.

Vocabulary Practice

A. 1. candidate; 2. manipulative; 3. alleged;
4. suspicions

B. 1. evaluate; 2. weird; 3. remorse;
4. deprived of; 5. frankly; 6. in terms of

C. 1. legal; 2. allege; 3. legislature

TEACHING NOTES

Before You Read



A. Scanning: Have students read the three names (1–3) and job descriptions (a–c), then scan paragraph A for the answers. Check answers as a class.

B. Skimming: The interview questions are before each paragraph on pages 144–145. Have students read these quickly and choose the topics (a–e) that they think will be discussed, then read the passage to check their answers.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 5: Poklis says, “... you aren’t going to plan” He means that people act quickly in America and poisoning someone would take too much time.

B. Words in Context: Remind students that they learned about understanding words from context in the reading skill in Unit 7A. If necessary, have students turn back to that section of the Student’s Book and review this skill. Have students scan the passage to find the words and phrases (1–5), and study the context around each one to match it with its definition (a–f). Then have students check answers with a partner. Remind them that one definition is extra.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Understanding Idiomatic Expressions**. Idioms are informal, common expressions that are often used in a casual way. They cannot be easily translated, so students will have to memorize them. Suggest students keep an idioms diary so every time students hear or read an idiom they can write it down, work out the meaning then use it in a sentence to help remember it.

A. Understanding Idiomatic Expressions: Have students read the sentences and match the idioms in bold with their meaning. Check answers in pairs.

- Question 1: Note similar idioms: *not if you paid me*, *not for love or money*, *not on any account*.
- Question 3: Point out other idioms with *rope*: *show the ropes* (teach), *end of one's rope* (frustrated), *know the ropes* (be experienced).

B. Understanding Idiomatic Expressions: Have students look back at Reading B to find the idioms in bold, then circle the definition. Check answers as a class.

Critical Thinking

- Have students reread paragraph E, then describe Poklis's opinion in their own words. Discuss the question with a partner.
- Have students note down their opinion and then share their answer with a partner. Take a class poll and facilitate a discussion based on the results.

Vocabulary Practice

A. Completion: This passage is about how arsenic was used as a popular poison in the past. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then choose the correct words to complete the passage. Check answers as a class, then choose a volunteer to read the completed passage aloud to the class.

B. Definitions: Have students match the words and phrases in the box with their definitions, then compare answers in pairs.

- Question 6: Point out that synonyms for *in terms of* are *about* and *in regard to*.

C. Word Roots: Ask students if they can think of any other words with the same root such as *legalize*, *illegal*, *legislation*, and *legacy*. Have students complete the sentences and share answers with a partner. If time allows, have students write a new sentence for each word in the box.



Video Summary: This video is about lie detector tests and gives information about how stressful lying can be. It shows a man who is trying to beat the test.

Key Vocabulary: *baseline, interrogation, spike*

Answer Key

Before You Watch

- A.** 1. baseline; 2. interrogation; 3. spike
B. Possible answer(s): take deep calming breaths, take blood pressure medication, use mental imaging tactics to convince themselves that the lie is true

While You Watch

- A.** b, c
B. 1. F (you breathe faster); 2. T; 3. F (Aldrich Ames was super relaxed.); 4. T; 5. F (He failed the test.)

Critical Thinking

- ▶ Possible answer(s): 3
- ▶ Possible answer(s): Yes, I think so because there is scientific proof about the way the results are analyzed.

While You Watch

A. Gist: Play the video. Then have students check the methods Jonny uses to try and beat the polygraph. Have students check answers in pairs, then say whether their predictions from Before You Watch B were mentioned.

B. Evaluating Statements: Have students answer T (true) or F (false) before watching the video again. Then play the video again and have students check answers in pairs, correcting the false statements.

Critical Thinking

- ▶ Have students answer and then share their rating with a partner.
- ▶ Have students note down reasons for and against allowing a polygraph test as evidence in a court of law. Then have students answer the question and discuss their ideas with a partner.

Vocabulary Review

Have students work individually to check their understanding of the unit's target vocabulary. If time allows, have students write an example sentence with each word. Ask for volunteers to read their completed sentences aloud to the class.

Additional vocabulary practice questions are available for download on the *Reading Explorer* website.

TEACHING NOTES

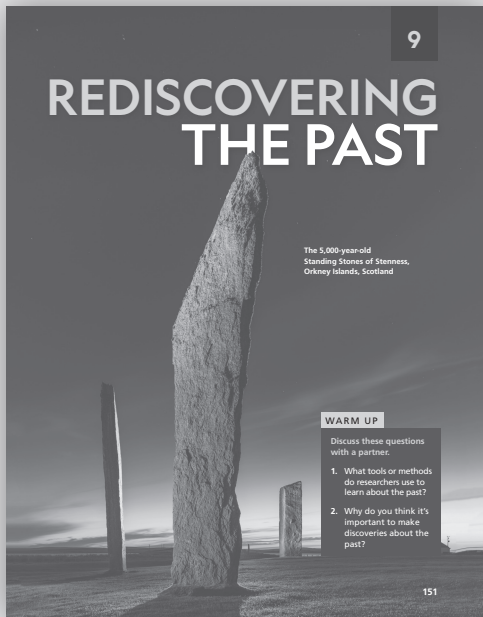
Before You Watch

A. Previewing: Have students read the paragraph and match the bold words with their definitions (1–3). Then have students compare answers with a partner.

B. Predicting: Have students answer the question and discuss their ideas with a partner.

REDISCOVERING THE PAST

9



UNIT INTRODUCTION

This unit focuses on new digital technology that allows scientists to learn more about the past. In “Virtually Immortal,” students read about Rani ki Vav, an ancient Indian well, and learn about how 3-D technology is being used to preserve a digital copy for future generations. In “Lure of the Lost City,” students learn how scientists used lidar to help locate a lost civilization in Honduras. In “Archeology From Space,” students will watch a video about how technology is used to explore the past. Students will also read about the tomb of Tutankhamun, and the lost city of El Dorado.

Visit the *Reading Explorer* website to download supplementary worksheets for this unit.

Key Words for Internet Research: *Rani ki Vav, digital scanning technology, the Scottish Ten, La Mosquitia, Ciudad Blanca, satellite photography, lidar*

WARM UP



Answer Key

Possible answer(s):

1. 3-D imaging, drones, carbon dating, DNA testing
2. Discoveries from the past teach us about our ancestors, which helps us understand more about who we are.

TEACHING NOTES

For centuries, humans have been interested in understanding the past. In recent years, technology has allowed scientists to more easily locate and study ancient cities and artifacts, and find better ways to preserve them for future generations.

- Read the Unit Title aloud as students look at the photo. Make sure they understand that *rediscover* means to discover again. Have students discuss how the picture relates to the past, considering that the material used in the photo was once “discovered” by the people who built it.
- Read the caption aloud and discuss how old 5,000 years actually is. Have students compare past events in history by drawing a timeline to illustrate how old the Standing Stones are.
- Have students discuss the questions with a partner and follow up with a class discussion.

LESSON OVERVIEW

Target Vocabulary: *assemble, bounce back, carving, column, firsthand, garment, gaze, memorial, stunned, virtual*

Reading Passage Summary: In the 1960s, archeologists dug out a magnificent ancient site in India called Rani ki Vav, built in the 11th century. Thanks to cutting-edge technology, the entire structure has now been recorded digitally as a way to preserve it for future generations to come.

Answer Key

Before You Read

- A.** Possible answer(s): **1.** There is an old historic building that used to be a stadium. The old post office has been rebuilt. **2.** Technology can be used to simulate how the buildings were originally built, and help engineers decide how to best complete restoration work. It can show images of what is inside sealed tombs without disturbing the ancient artifacts.
- B.** Possible answer(s): The building looks like it could be a temple or a home for an emperor. Actual answer: It is a well.

Reading Comprehension

- A. 1.** a; **2.** c (Para C); **3.** d; **4.** a (Para K); **5.** b
- B. 1.** K; **2.** G; **3.** I; **4.** H; **5.** E

Reading Skill

- A. 1.** ...*it is* a well; **2.** ...*the water* seeps down; **3.** ...the most magnificent *works of art*; **4.** ...*putting on* earrings; **5.** ...*leads* into the well itself
- B. 1.** "Wise men speak because they have something to say; fools *speak* because they have to say something." **2.** "To err is human, to forgive *is* divine." **3.** "If you don't love something, you're not going to go the extra mile, *you're not going to* work the extra weekend, *you're not going to* challenge the status quo as much."

Critical Thinking

- Possible answer(s): the Taj Mahal; Machu Picchu; Stonehenge; the statues on Easter Island; the Pyramids; the Colosseum
- Possible answer(s): I think the Taj Mahal, the Pyramids, and the Colosseum because the history behind these three buildings is immense, and the time and cost of human life that went into building them should never be lost.

Vocabulary Practice

- A. 1.** firsthand; **2.** gazed; **3.** stunned; **4.** garments; **5.** virtual
- B. 1.** returns to you; **2.** after a friend dies; **3.** cutting into; **4.** put the pieces together; **5.** floor to ceiling
- C. 1.** tour; **2.** reality; **3.** classroom

Before You Read

A. Discussion: Have students read the questions and discuss their answers with a partner. Have them brainstorm ways technology can be used to record historic buildings.

B. Predicting: Have students look at the picture. Then have pairs discuss what they think the structure is. Have students read the passage to check their ideas.

Reading Comprehension

A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 1: Point out the phrases *what seems to be* and *However* in paragraph A. This contrast tells us that the structure is not a temple.

- Question 5: Although there are 10 buildings listed, the Scottish Ten is a project, not a list of historical sites.

B. Scanning: Remind students that they learned about scanning for information with matching information questions in the reading skill in Unit 4A. If necessary, have students turn back to that section of the Student's Book and review this skill. Ask students to read each statement carefully and identify key words or phrases. Have students find the information and note the paragraph letter. Check answers as a class.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Recognizing Ellipsis**. Writers omit certain words or phrases to create less repetition and improve the flow of the text.

A. Recognizing Ellipsis: Have students read the sentences from Reading A and decide where the bold word or phrase should go. Check answers in pairs.

B. Recognizing Ellipsis: Have students read the famous quotes and add any missing words. Have students discuss in pairs what the quotes mean. In quote 3, point out that adding the missing words makes the quote sound redundant because of the repetition.

Critical Thinking

- Have students make a list of cultural sites and artifacts they think should be digitally preserved. Have them discuss their answers with a partner.
- In pairs, have students choose their top three and note down their reasons. Have students share ideas with the class.

Vocabulary Practice

A. Definitions: This passage is about the tomb of Tutankhamun. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then match each word in red with its definition (1–5). Check answers as a class and then choose a volunteer to read the completed passage aloud to the class.

- Question 1: A common collocation with *firsthand* is a *firsthand account* (as a witness). We can also say *I heard it secondhand* (not heard directly).
- Question 2: Point out that the meaning of *gaze* here suggests looking at the tomb in wonder and awe.

B. Words in Context: Have students circle the correct words to complete the sentences. Check answers as a class.

- Question 2: Elicit words with the same root: *memory, memorize, commemoration, remembrance*.

C. Collocations: The word *virtual* (in computing) means not existing physically but made by software to appear real. Ask students to share experiences of *virtual reality* games they have played or *virtual tours* they have been on. Have students complete the sentences and check answers in pairs. Remind students that one word is extra. If time allows, have students write a new sentence for each collocation.

LESSON OVERVIEW

Target Vocabulary: *extensive, fascinated, inhabitant, legend, pyramid, satellite, slope, trail, uncover, vegetation*

Reading Passage Summary: In 2015, a team of researchers and archaeologists explored a remote area of Honduras thought to contain a lost city called Ciudad Blanca. They believed there were ruins of a lost city, abandoned for at least 500 years. New technology was used to help them locate the ruins, and they recorded what they found using 3-D imaging. Nothing they found was touched or removed and further expeditions are planned with the permission of the Honduran government.

Answer Key

Before You Read

- A.** Possible answer(s): Atlantis is a city rumored to have existed before it sank into the ocean. No one knows exactly where it was, or if it was actually a real place at all. People have been looking for Atlantis for centuries, and many theories exist about it today.
- B.** Possible answer(s): Researchers could use drones and GPS to try and map out this area. The main challenges would be overland travel through the dense jungle and finding clues they'd need to help guide them to the ancient city. There would also be wild animals.

Reading Comprehension

- A.** 1. c; 2. d (Para G); 3. b; 4. a (Para J); 5. c
- B.** 1. F (The Lost City of the Monkey God is also known as Ciudad Blanca. La Mosquitia is a region.); 2. T; 3. NG; 4. T; 5. F (Fisher's team didn't touch or remove anything.)

Reading Skill

- A.** 1. legend; 2. explorers; 3. rain forest; 4. items; 5. divulge
- B.** 1. reports; 2. photographs; 3. jungle canopy; 4. laser beams; 5. astonishing

Critical Thinking

Possible answer(s): No, I don't think they should use invasive techniques. **For:** to learn more about the history; museums could house the artifacts and they'd be well preserved; people could make a lot of money; **Against:** the environment would be ruined; the artifacts could be damaged; technology today can document the lost city without disturbing the land

Vocabulary Practice

- A.** 1. fascinated; 2. inhabitants; 3. legend; 4. uncover; 5. satellite; 6. extensive
- B.** 1. side; 2. a forest; 3. plants, trees, and flowers; 4. triangle
- C.** 1. folktale; 2. myth; 3. legend

TEACHING NOTES

Before You Read

A. Discussion: Have students read the questions and share their answers with a partner.

B. Predicting: Have students look at the photo and consider the terrain and the landscape, imagining what it might be like to be on the ground. Have students answer the questions, then discuss their ideas with a partner before reading the passage to check their ideas.

Reading Comprehension

A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 5: Paragraph L refers to stone sculptures in the shape of animals, not buildings.

B. Evaluating Statements: Have students read the statements and answer T (true), F (false), or NG (not given). Then students check answers with a partner, correcting any false statements.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Scanning for Information (3)—Summary Completion**. Remind students that they have already learned about this concept. The incomplete summary is a paraphrase of what they have read, so the words given to complete the summary are also often synonyms or paraphrases of those from the reading passage.

A. Summarizing: Have students read the summary and complete it with the correct words or phrases from the box. Remind students to read the summary quickly and identify the likely part of speech for each missing word first. Then try to predict the answers before scanning the reading to find them. Check answers as a class.

B. Summarizing: Have students read the summary and complete it with words from the reading passage. Then check their answers with a partner.

Critical Thinking

Have students think about the pros and cons of using invasive techniques in La Mosquitia. After making a list, have students answer the question and share their ideas with a partner. Discuss ideas with the class.

Vocabulary Practice

A. Completion: This passage is about the lost city of El Dorado. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then circle the correct words to complete the passage. Check answers as a class and then choose a volunteer to read the completed passage aloud to the class.

B. Words in Context: Have students circle the correct words to complete the sentences, then check answers with a partner.

C. Word Usage: Have students give examples of legends, myths, and folktales they know. Have students match the words to each example and then share answers with a partner.



Video Summary: This video is about how state-of-the-art technology—photography equipment in the past and drones and satellite images these days—is used in archeology. Space archeology is the use of satellite images for mapping ancient archeological and environmental features. This imagery can highlight specific items that might be buried beneath the Earth’s surface.

Key Vocabulary: *figure out, pinpoint, state-of-the-art, subtle*

Answer Key

Before You Watch

A. 1. figure out; 2. pinpoint; 3. subtle; 4. state-of-the-art

While You Watch

A. a, b, c

B. 1. NG; 2. T; 3. F (within a few meters); 4. NG

Critical Thinking

- ▶ Possible answer(s): Citizens might be able to identify and locate sites that aren’t obvious. They could have a different perspective on what the images actually show. By identifying potential sites quickly, this may stop sites from being looted and help archeologists to preserve these sites for the future.
- ▶ Possible answer(s): Yes, I would. I think satellite imagery is interesting, and I’d like to help contribute to archeological research in some small way.

While You Watch

A. Gist: Play the video. Then have students check the topics. Compare answers in pairs,

B. Evaluating Statements: Have students answer true (T), false (F), or not given (NG) before watching the video again. Then play the video again and have students check answers in pairs, correcting the false statement.

Critical Thinking

- ▶ Have students answer the question and note down some ideas, then discuss their ideas with a partner.
- ▶ Have students give their opinion, then discuss their ideas with a partner.

Vocabulary Review

Have students work individually to check their understanding of the unit’s target vocabulary. If time allows, have students write an example sentence with each word. Ask for volunteers to read their completed sentences aloud to the class.

Additional vocabulary practice questions are available for download on the *Reading Explorer* website.

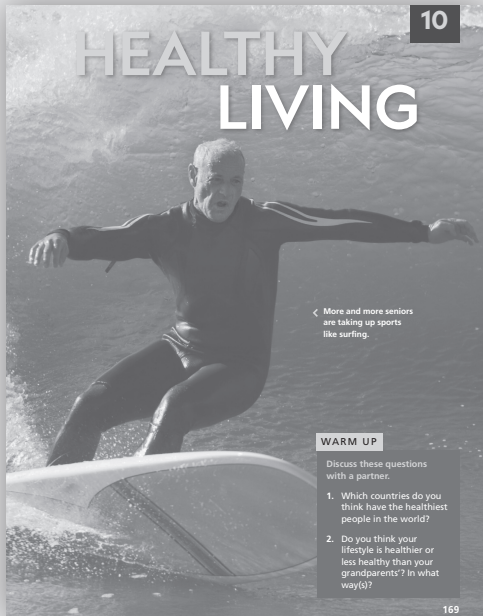
TEACHING NOTES

Before You Watch

A. Previewing: Direct students attention to the infographic and caption above the title on page 167. Have students read the paragraph and match the bold words with their definitions (1–4). Then have students compare with a partner.

HEALTHY LIVING

10



UNIT INTRODUCTION

This unit focuses on longevity and common factors that are present in longer lifespans. In “Living Longer,” students read about how genetics, diet, and lifestyle all play a key role in enabling people to live longer. In “In Search of Longevity,” students read about how nutrition, an active social life, and a bit of luck can lead to a happy, long, and fulfilled life. In “You Are What You Eat,” students will watch a video about the Mediterranean diet. Students will also read about a tiny worm that may help extend human life, and how animals that eat less might live longer.

Visit the *Reading Explorer* website to download supplementary worksheets for this unit.

Key Words for Internet Research: *genes, healthy diet, Okinawa, Sardinia, Loma Linda, Laron syndrome, centenarian*

WARM UP

Answer Key

Possible answer(s):

1. Maybe parts of South America and Scandinavia countries with easy access to nature and free or affordable healthcare
2. I think my lifestyle is healthier than that of my grandparents because of modern advances in medicine and better nutrition.

TEACHING NOTES

People are living longer today than ever before in human history. As people start retiring with good health, they are starting to participate in hobbies

and activities that they didn’t have the time to pursue during their working lives. The result is more and more seniors having fun and taking up new activities later in life.

- Read the Unit Title aloud as students look at the photo. Have students discuss how what the man is doing is related to healthy living.
- Read the caption aloud and have students say what types of activities they think seniors typically do. How is that different from what this man is doing?
- Have students discuss the questions with a partner. Follow up with a class discussion.

LESSON OVERVIEW

Target Vocabulary: *chronic, elderly, epidemic, homogeneous, immune, lifespan, mandatory, passed down, relocate, slightly*

Reading Passage Summary: Scientists believe that genetics can be partly responsible for a long lifespan. Researchers looked at the genes of elderly people in small, isolated communities in Italy, Ecuador, and California, and determined that genes do have a role to play in longevity. According to geneticist Giuseppe Passarino, genetics are just one piece of the puzzle—environment and luck also have a role to play in determining who lives a long life.

Answer Key

Before You Read

- A.** 1. gene; 2. centenarians; 3. diabetes
B. Students' own answers. Giuseppe Passarino's estimate: 25%.

Reading Comprehension

- A.** 1. a; 2. b (Para D); 3. c; 4. b (Para F);
 5. d (Para J and Para K)
B. 1. their; 2. Indeed; 3. As

Reading Skill

- A.** 1. When asked about (the reasons) for his long life, he said he avoided drinking, smoking, and women, that he'd eaten mostly figs and beans while growing up and hardly ever any red meat; 2. (owing to) a gene that affects their sense of taste, and this gene gives them a taste for healthy bitter foods; 3. (because of) a gene that causes a condition called Laron syndrome; 4. (because of) a lack of roads, phones, and electricity; 5. (because) he knows he is immune to cancer and diabetes
B. 1. the reasons; 2. owing to; 3. because of; 4. because of; 5. because

Critical Thinking

Possible answer(s): How often do you exercise? What do you typically eat each day? What time do you go to sleep? What time do you wake up? Do you do group activities?

Vocabulary Practice

- A.** 1. passed down; 2. slight; 3. lifespan; 4. elderly
B. 1. large; 2. have; 3. the same kind; 4. won't; 5. long; 6. move to a new
C. 1. lifespan; 2. lifestyle; 3. lifelong; 4. lifelike

Before You Read



A. Definitions: Have students read the caption then complete the definitions (1–3) with the words in bold. Check answers as a class. For sentence two elicit that *cent* means “hundred.”

B. Predicting: Have students answer the question and share their ideas with a partner before reading the passage to check.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 1: Point out that the word *may* in option “a” signals a theory and not a fact.
- Question 5: In paragraph J, Passarino says, “It’s certain genes at certain times,” which refers to the environment. He believes that genes are probably responsible for 25 percent of living a long and healthy life. Circumstance kept Caruso from going to war, so he feels a little luck helps people live a long life, too.

B. Coherence: Have students read the sentences (1–3) and circle the best option for each, then check answers in each given paragraph.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Recognizing Cause and Effect Relationships (2)**. Remind students that they have already learned about this concept in Unit 3A. The cause, or reason, is the event that happens first but the writer may put this reason before or after the action in the writing passage. Remind students to look for words and phrases that signal reasons to help recognize cause-and-effect relationships.

A. Scanning: Have students scan Reading A and write short answers to each question (1–5). Check answers in pairs.

B. Cause and Effect: Have students look back at Reading A and underline the words or phrases in the passage that signal the reasons in activity A. Check answers as a class.

Critical Thinking

Have students read the question. Elicit the three regions mentioned in the article: Calabria (Italy), Ecuador, and California (U.S.A.) Then have students look back at the passage to identify and evaluate the evidence produced by each region before thinking about what type of questions they would ask a group of centenarians. Have students note their questions and then share their ideas with a partner.

Vocabulary Practice

A. Completion: This paragraph is about experiments on a tiny worm that may help extend human life. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then use four of the words in the box to complete the paragraph. Remind students that two options are extra. Check answers as a class and then choose a volunteer to read the completed paragraph aloud to the class.

- Question 1: Point out other phrasal verbs with *pass*: *pass out*, *pass over*, *pass by*, *pass up*.
- Question 2: Elicit that *slight* means "not much."
- Question 3: Confirm to students that *lifespan* refers to the period of time between two dates ("birth" and "death"). Similarly, *wingspan* refers to the distance between two points—the measure of the distance from the tip of one outstretched wing to the other.

B. Words in Context: Have students circle the words to complete the sentences (1–6). Check answers as a class.

- Question 3: Elicit the prefix *homo-* (same) and give other examples such as *homophone*, *homogenize*, *homonym*.
- Question 5: Point out that *chronic* describes something that happens for a long time: *chronic ailment*, *chronic fatigue*.

C. Word Parts: Have students complete the sentences (1–4) with the correct word from the box and check answers in pairs. If time allows, have students write a new sentence for each word.

LESSON OVERVIEW

Target Vocabulary: *barely, discourage, forbid, guideline, industrious, ironically, lean, longevity, privilege, relieve*

Reading Passage Summary: People from three different communities—Sardinians, Adventists, and Okinawans—tend to have longer than average lifespans. Many of these people have certain “guidelines” they follow to improve their lives. Their lifestyle, diet, and genetics are all contributing factors to their longevity.

Answer Key

Before You Read

- A.** Possible answer(s): They have low-calorie, plant-based diets.
B. Students’ own answers

Reading Comprehension

- A. 1.** c; **2.** a; **3.** b; **4.** c; **5.** c
B. 1. a, e; **2.** d, g; **3.** c, f

Reading Skill

- A. 1.** family; **2.** twice; **3.** homegrown; **4.** alcohol; **5.** 4; **6.** Californian; **7.** 87; **8.** climate; **9.** network
B. Quantitative data: **Sardinians:** 91 of 17,865 people born between 1880 and 1900 have lived to 100; rate is more than twice as high as national average; genetics—80% directly related to first Sardinians; **Adventists:** drinking 5 glasses of water a day and eating 4 servings of nuts each week; live 4–10 years longer than the average Californian; **Okinawans:** average lifespan of 81 (men) and 87 (women); lower rates of cancer and heart disease than Americans. Remaining data is qualitative.

Critical Thinking

- Possible answer(s): I don’t smoke. I exercise every day, and don’t eat red meat. I have a lot of good friends, and I see my family regularly.

- Possible answer(s): I think it would be hard for me to grow all my own food, and I like to have a few glasses of wine every week. I don’t think I could follow all of the advice here.

Vocabulary Practice

- A. 1.** longevity; **2.** lean; **3.** barely; **4.** guideline; **5.** ironic
B. 1. mustn’t; **2.** shouldn’t; **3.** hardworking; **4.** special advantage; **5.** free them from
C. 1. sense of; **2.** disaster; **3.** provide

TEACHING NOTES

Before You Read

A. Discussion: Have students read the caption and answer the question individually. Then have students discuss answers with a partner.

B. Scanning: Have students read the passage individually and add in other information. Discuss answers as a class.

Reading Comprehension

A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 2: Point out that lifestyle is mentioned in paragraph D, and nutrition and genetics in paragraph E. Therefore, option “a” is the correct option.
- Question 3: *compelling* means “convincing,” and refers to the difference in the two lifespans.
- Question 4: Point out that natural environment is mentioned in paragraph L, diet in paragraph M, and social relationships in paragraph N, leaving option “c” as the only possible answer.

- Question 5: Note that option “c” is the only one mentioned for all three groups.

B. Matching: Have students match each person (1–3) to their guidelines for longevity (a–g). One guideline is extra and is not mentioned in the passage. Have students check answers with a partner.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Understanding Quantitative and Qualitative Data**. Quantitative data is statistical information, whereas qualitative data is based on observation and interpretation. Qualitative data is often used in writing to describe behavior or make observations about trends.

A. Completion: Have students complete the chart with words or numbers from Reading B. Remind students to use only one word or one number for each space. Check answers in pairs.

B. Analyzing: Have students underline the quantitative data and circle the qualitative data. Note that “lower rates of cancer and heart disease than Americans” does not include a number but it does refer to a statistical pattern and is therefore considered quantitative. Have students check answers with a partner.

Critical Thinking

- Have students think about which of the guidelines to longevity they currently follow and share their answers with a partner.
- Have students think about how they could change their lifestyle to fit the guidelines mentioned in the passage. Ask whether it would be easy or hard for them to do. Have students share their answers with a partner.

Vocabulary Practice

A. Definitions: This passage explores the idea that eating less has an effect on animal longevity and whether this could be a guideline for slowing aging in humans too. Direct students’ attention to the photo and caption next to activity A. Have students read the information first, then match each word in red to its definition (1–5). Check answers as a class and then choose a volunteer to read the completed passage aloud to the class.

- Question 2: Point out *lean meat* has the fat trimmed off. A person without much body fat can also be described as *lean*.
- Question 3: Elicit that *barely* and *slightly* (from Reading 10A) both refer to “a little.”
- Question 4: Point out that *guideline* differs from a rule in that rules must be followed, while a guideline is only advice.

B. Words in Context: Have students circle the correct words to complete the sentences and then compare answers in pairs.

- Question 1: Note the strength of the word *forbid*; it means “prohibit.”
- Question 4: Ask students to think of some *privileges* an employee might be given.

C. Collocations: The word *relief* means a sense of calmness and relaxation after feeling stressed or experiencing anxiety. Have students complete the sentences and share answers with a partner. If time allows, have students write a new sentence for each collocation.

- Note the slightly different definitions of *relief*. It can refer to a feeling as in *feel relief*, *sense of relief*, and *sigh of relief*. However, in *provide relief*, *pain relief*, and *relief from symptoms*, it refers to something that stops the pain or symptoms, such as medicine. In *disaster relief*, the word refers to things such as money, food, or clothing provided to help people affected by a disaster.

Video Summary: This video is about the diet and lifestyle of the people who live in Crete. It tells about how they get the food they eat and the positive effects it has on their lives.

Key Vocabulary: *grove, omega-3, quintessential*

Answer Key

Before You Watch

A. 1. c; 2. a; 3. b

B. Possible answer(s): olive oil, red wine, salad, pasta, nuts, figs, dates

While You Watch

A. c

B. b, c, e, f

Critical Thinking

Possible answer(s): I would consider living in Sardinia. I love the Mediterranean climate and food. I would love a more slow-paced lifestyle too, where I could have long relaxing meals with family and friends.

TEACHING NOTES

Before You Watch

A. Previewing: Have students read the paragraph and match the bold words with their definitions (1–3). Then have students compare with a partner.

B. Discussion: Have students answer the question and discuss their ideas with a partner.

While You Watch

A. Main Idea: Play the video. Then have students choose the main message. Have students compare answers in pairs.

B. Detail: Have students read the claims (a–f) and check the ones that are made in the video. Play the video again, and check answers as a class.

Critical Thinking

Have students make a list of all the places mentioned in the unit, then consider if they would want to live in any of them. Have students discuss their answer with a partner.

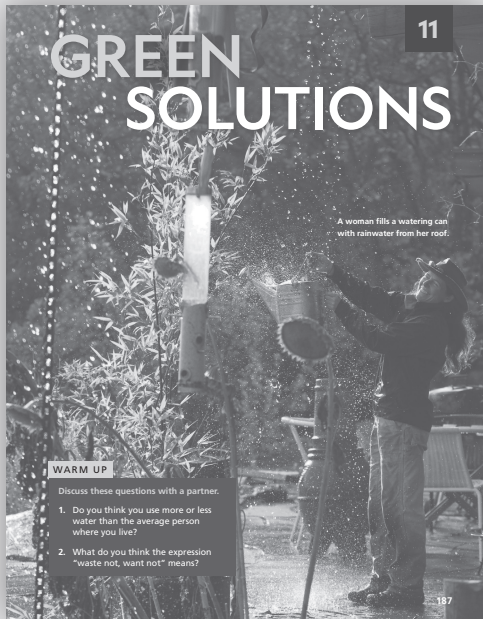
Vocabulary Review

Have students work individually to check their understanding of the unit's target vocabulary. If time allows, have students write an example sentence with each word. Ask for volunteers to read their completed sentences aloud to the class.

Additional vocabulary practice questions are available for download on the *Reading Explorer* website.

GREEN SOLUTIONS

11



UNIT INTRODUCTION

This unit focuses on environmental problems that threaten our world today, and possible solutions to help those affected. In “Saving Water,” students read about what is being done to solve water shortages around the globe. In “Technology as Trash,” students learn about the world of e-waste and what can be done to reduce its hazardous effects. In “Your Water Footprint,” students will watch a video highlighting the environmental cost of a T-shirt and what we can do to reduce its carbon footprint. Students will also read about water conservation efforts in the future, and the dangers posed by sending e-waste to developing nations.

Visit the *Reading Explorer* website to download supplementary worksheets for this unit.

Key Words for Internet Research: *water conservation, Rajendra Singh, e-waste, obsolete technology*

WARM UP

Answer Key

Possible answer(s):

1. I think I use more water because I usually take two showers every day.
2. I think it means that if you use things sparingly, you'll never be without them. In other words, you should conserve what you have. / I think it means don't waste anything because you might need it in the future.

TEACHING NOTES

People are becoming more and more aware of threats to the environment and, as a result, are thinking about new ways to conserve our natural

resources. Recycling rainwater is one way to solve the water shortage problem, which is affecting many communities around the world.

- Read the Unit Title aloud as students look at the photo. Have students discuss what the woman is doing and how it relates to being “green.” (She wants to keep the environment healthy by not wasting natural resources or causing pollution.)
- Read the caption aloud and have students discuss other ways to be “green.”
- Have students discuss the questions with a partner and then follow up with a class discussion.

LESSON OVERVIEW

Target Vocabulary: *consumption, crisis, dedication, divert, extent, inherit, related to, shortage, surpass, whereby*

Reading Passage Summary: Water shortages exist everywhere, and the problem is now a global crisis. Spain, India, and South Africa are just three countries of many where some people do not have enough water to stay healthy. In these areas, experts are working with the local communities to find new and innovative ways to conserve water.

Answer Key

Before You Read

- A. 1.** 3; **2.** farming; **3.** 5,000; **4.** the same amount of
B. Spain, India, and South Africa; water shortages due to wells being dug; lack of rain; lack of dams; broken water pipes and poor plumbing

Reading Comprehension

- A. 1.** c; **2.** b; **3.** a (Para G); **4.** b; **5.** b
B. 1. farming; **2.** wells; **3.** water; **4.** dam; **5.** raise / replenish; **6.** wasted; **7.** consumption / use; **8.** dams

Reading Skill

- A. 1.** Julio Escudero; **2.** Neil Macleod;
3. Sandra Postel
B. 1. b; **2.** c; **3.** b; **4.** a; **5.** b

Critical Thinking

Possible answer(s): **a firsthand account from a farmer:** Pro: he knows what the problems are; Con: he's biased; **research from a scientific journal:** Pro: trustworthy research; Con: not a firsthand account; **statistics from a government department:** Pro: well researched; Con: numbers could be skewed to suit the government's agenda; **a report from an environmental organization:** Pro: they probably know the subject well; Con: results could be biased to fit their agenda.

Vocabulary Practice

- A. 1.** surpass; **2.** shortages; **3.** crisis; **4.** extent; **5.** consumption; **6.** diverted
B. 1. whereby; **2.** related to; **3.** inherit; **4.** dedication
C. 1. revealed; **2.** acknowledge; **3.** know

Before You Read



A. Quiz: Have students take the quiz and then check their answers on page 202.

B. Scanning and Predicting: Have students scan the passage to find the three regions mentioned. Then have students think about what kinds of water problems exist in these places before reading the passage to check their ideas.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 2: Option "a" is mentioned at the beginning of paragraph C, option "c" is discussed in paragraph B, and option "d" comes up in paragraph A, leaving option "b" as the correct answer.
- Question 4: Point out that Macleod thought they would need to build another dam, but they did not have to in the end.
- Question 5: Sandra Postel is a conservationist, so we know that her mission is to protect water. Therefore, "big gains" must refer to "addressing water shortages."

B. Cause and Effect: Remind students that they learned about recognizing cause and effect relationships in the reading skill in Unit 3A. If necessary, have students turn back to that section of the Student's Book and review this skill again. Have students complete each blank with one word from the passage and then check answers in pairs.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Identifying Sources of Information**. A *source* is a person or publication that provides information about a topic. A credible source is one that can be trusted.

A. Identifying Sources: Have students look back at Reading A and find each source (1–3). A *resident*, *the head*, and *the director* are all people, so they should look for names.

B. Identifying Sources: Have students look back to each indicated paragraph in Reading A and choose the correct source (a, b, or c) for each statement (1–5). Remind students that a source is not always given for information in a text. Check answers as a class.

Critical Thinking

Have students read the question, then think about the pros and cons of each source listed. In pairs, have students discuss how each source could be credible, while at the same time considering how each source might be biased.

Vocabulary Practice

A. Completion: This passage is about how water conservation measures, such as raising the cost of water, could reduce people's consumption levels. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then use the words or phrases in the box to complete the passage. Check answers as a class and then choose a volunteer to read the completed passage aloud to the class.

- Question 1: Elicit synonyms for *surpass*: *exceed*, *go beyond*.
- Question 2: Note common collocations with shortage: *water shortage*, *food shortage*, *skills shortage*.
- Question 6: Note that *divert* is also used to refer to airplanes that make abrupt changes to their routes. (*The flight was diverted to New York because of the storm.*)

B. Definitions: Have students match the words or phrases in red in activity A to the definitions (1–4). Check answers as a class.

- Question 4: Note that *dedicate* as a verb refers to a person giving their time (*She dedicated five hours to the project*), or when a thing is given as a donation (*The tree was dedicated to the park*). As a noun, *dedication* refers to the quality of being committed to something.

C. Collocations: The word *extent* means “the degree or scale” of something. Have students circle the correct verb to complete the sentences and check answers in pairs. If time allows, have students write a new sentence for each of the three verbs in bold that were not used in sentences 1–3.

LESSON OVERVIEW

Target Vocabulary: *discard, distressing, hazardous, infrastructure, notify, obsolete, pile, substance, toxic, transition*

Reading Passage Summary: With modern technology improving at a rapid rate, computers, smartphones, and other electronic devices quickly become obsolete. Many of them end up in developing countries as e-waste, where their parts are melted down and pieces are left to pollute the environment and harm the health of those working in the landfills and hoping to reuse the parts.

Answer Key

Before You Read

- A.** Possible answer(s): **1.** I usually give it to an older family member or donate it. **2.** They end up in a landfill somewhere; parts might be recycled and reused to make new devices.
- B.** Possible answer(s): too much waste in landfills, poisons the environment, causes health problems

Reading Comprehension

- A. 1.** c; **2.** b (Para A); **3.** d; **4.** a; **5.** b
- B. 1.** e; **2.** d; **3.** f; **4.** c; **5.** g; **6.** a

Reading Skill

- A. Positive:** attractive, fortunately, ideal, valuable; **Neutral:** secretly, typical, ultimately; **Negative:** arrogantly, sadly, selfish
- B. 1.** – (sadly); **2.** + (ideal); **3.** – (the problem is); **4.** – (distressing)

Critical Thinking

Possible answer(s): I don't think the writer is critical of the people in Ghana. I think the writer blames the people in developed countries for producing so much e-waste in the first place.

Vocabulary Practice

- A. 1.** infrastructure; **2.** piles; **3.** discarded; **4.** substances; **5.** toxic; **6.** hazardous
- B. 1.** problems; **2.** changes gradually; **3.** told; **4.** no longer useful
- C. 1.** toxic; **2.** natural; **3.** banned

TEACHING NOTES

Before You Read



A. Discussion: Have students read the questions and discuss their answers with a partner.

B. Skimming and Predicting: Have students read just the first sentence of each paragraph (C–G) and predict what problems e-waste causes. Discuss answers as a class before students read the whole passage to check their ideas.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 3: If you run to *keep up* with someone, you are working hard to match their pace. It means to “continue going” to match someone or something. Point out that the opposite of *keep up* is *fall behind*.

B. Identifying Purpose: Have students scan the paragraphs listed and match them with its purpose (a–g). One purpose is extra and is not mentioned in the passage. Have students check answers with a partner.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill



Have students read the paragraph **Understanding a Writer's Attitude**. Writers use words and phrases as a way to give clues about their feelings on a topic. Students should look for these words and determine whether they indicate a positive, neutral, or negative attitude.

A. Classifying: Have students add the words to the correct column in the chart. Check answers in pairs. While the adjective *ultimate* often indicate a positive attitude, the adverb *ultimately* is neutral because it means “finally.”

B. Understanding Attitude: Have students read the statements (1–4). Ask them to find these sentences in Reading B before marking them with (+) or (–). Then have students compare answers in pairs and underline any words in the passage that helped them decide.

Critical Thinking

Have students look back at the passage and answer the question about the writer’s attitude. Encourage students not to allow their own biases to drive their answer here, but rather to think about the writer’s perspective. Have them share their ideas with a partner.

Vocabulary Practice

A. Completion: This passage is about the dangers of used electronics in developing nations. Direct students’ attention to the photo and caption next to activity A. Have students read the passage first, then circle the correct words to complete the information. Check answers as a class and then choose a volunteer to read the completed passage aloud to the class.

- Question 1: Point out the prefix *infra-* which means “below.”
- Question 2: Suggest synonyms of *piles*: *mounds, heaps, stacks, loads*.
- Question 4: Note to students that *substance* is a general term to mean “a particular type of matter,” and often follows an adjective (a *toxic substance*, a *sticky substance*, a *white substance*).

B. Words in Context: Have students circle the correct words to complete the sentences, and then compare answers in pairs.

C. Collocations: Have students complete the sentences and share answers with a partner. If time allows, have students write a new sentence for each collocation in the box.

- Question 2: A *natural substance* usually refers to substances that are a product of nature, such as those found in plants and animals.
- Question 3: *Banned substances* at the Olympic Games include steroids and hormone modifiers.

Video Summary: This video shows how cotton has an impact on the planet. It gives facts about the ways cotton affects the environment.

Key Vocabulary: *cotton*

Answer Key

Before You Watch

- A.** Possible answer(s): **1.** T-shirt, socks, underpants; **2.** it is lightweight and easy to wash; **3.** towels, sheets, paper
- B.** Possible answer(s): Very large amounts of water and energy are used in the manufacturing, distribution, and care of cotton clothing. This has a negative impact on the environment.

While You Watch

- A.** See Before You Watch B.
- B.** **1.** 2,700; **2.** 900; **3.** 5; **4.** 40; **5.** 1/3

Critical Thinking

Possible answer(s): The government could insist on a water ban to help conserve water, and all families could use rain barrels instead of water hoses and sprinklers in the short term. In the longer term, dams and reservoirs could be built. Individuals could also spend less time in the shower and only use the washing machine when there is a full load.

TEACHING NOTES

Before You Watch

A. Discussion: Have students read the definition and answer the questions (1–3). Then have students compare their ideas with a partner.

B. Predicting: Have students answer the question and discuss their ideas with a partner.

While You Watch

A. Gist: Play the video. Then have students say if any of their predictions were mentioned. Discuss answers as a class.

B. Completion: Have students complete the paragraph using numbers from the box before watching the video again. Remind students that one option is extra. Play the video again and have students check answers in pairs.

Critical Thinking

Have students read the question and note their answers. Then have students discuss their ideas with a partner. Elicit answers from the class.

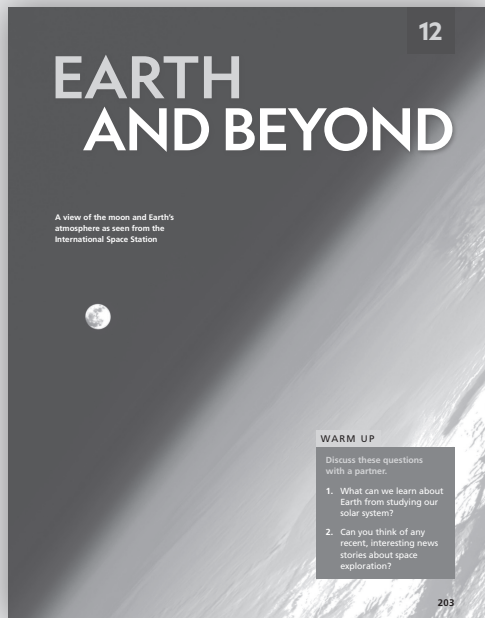
Vocabulary Review

Have students work individually to check their understanding of the unit's target vocabulary. If time allows, have students write an example sentence with each word. Ask for volunteers to read their completed sentences aloud to the class.

Additional vocabulary practice questions are available for download on the *Reading Explorer* website.

EARTH AND BEYOND

12



UNIT INTRODUCTION

This unit focuses on what lies beyond our planet in space. In “Planet Hunters,” students read about how astronomers are searching for planets outside our solar system. In “The Threat From Space,” students learn about the risk of meteorites colliding with the Earth and what scientists are doing to lessen the threat. In “Shooting Stars,” students will watch a video about meteors. Students will also read about the possibility of making contact with aliens, and how our moon likely formed.

Visit the *Reading Explorer* website to download supplementary worksheets for this unit.

Key Words for Internet Research: *exoplanet, Doppler technique, transits, Giese 581 d, Apophis, asteroid detection*

WARM UP



Answer Key

Possible answer(s):

1. We can learn more about how Earth was formed; we might find innovative ways to conserve our natural resources.
2. There are many interesting news stories about plans to travel to Mars. I also recently read an article about a large object that is not from our solar system traveling quickly past our Sun.

TEACHING NOTES

The International Space Station is a space laboratory in orbit around Earth and was launched

in 1998. Its mission is to research what happens to people when they live in space, and it is used to help astronauts prepare to go even deeper into space in the future.

- Read the Unit Title aloud as students look at the photo. Have students discuss what *beyond* means in this context and say what they think the different colors in the photo show.
- Read the caption aloud and make sure students understand the meaning of *atmosphere* and know what the International Space Station is. Have students discuss what they know about our solar system, and what lies beyond it.
- Have students discuss the questions with a partner and follow up with a class discussion.

LESSON OVERVIEW

Target Vocabulary: *atmosphere, atomic, composition, exclude, hence, resemble, scope, spin, thrive, to date*

Reading Passage Summary: Humans have always been interested in space, and over time astronomers have mapped out our solar system. Now astronomers are looking deeper into space to study *exoplanets*—planets in other solar systems that orbit their own star. They are hoping to find another planet out there that supports life.

Answer Key

Before You Read

A. Possible answer(s): They might want to find out whether the exoplanets are similar to Earth. They want to see if there's any possibility of alien life.

B. a, b

Reading Comprehension

A. 1. c; **2.** c (Para B); **3.** d; **4.** b; **5.** a (Para L)

B. 1. F; **2.** F; **3.** F; **4.** S ("may"); **5.** F;
6. S ("would almost certainly")

Reading Skill

A. 1. a; **2.** g; **3.** c; **4.** b; **5.** e; **6.** d

Critical Thinking

Possible answer(s): I think it's important to invest in space exploration, but only within our own solar system. We are destroying the environment on our planet, so humans need to find alternatives to our current climate crisis. Maybe we can find ways to inhabit Mars.

Vocabulary Practice

A. 1. To date; **2.** atmosphere; **3.** scope; **4.** hence
B. 1. nuclear; **2.** around and around; **3.** similar to;
4. really; **5.** not part; **6.** the parts it is made of
C. 1. composed; **2.** combine; **3.** compared

Before You Read



A. Discussion: Have students read the caption and answer the question, then discuss their ideas with a partner.

B. Skimming: Have students look at the reading title and headings and quickly skim through the passage and infographic. Then have students check the topics they think they will read about. Have them read the passage to check their answers.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 2: The phrase *nearly 3,900* in paragraph B means "almost 4,000." *Nearly* means not as much as, but very close.
- Question 5: The author says that life existed on Earth before land plants. At that time, Earth would not have shown a "red edge." Therefore, life may exist on other planets without a "red edge."

B. Fact or Speculation: Remind students that they learned about distinguishing fact from speculation in the reading skill in Unit 5B. If necessary, have students turn back to that section of the Student's Book and review this skill again. Have students choose F (fact) or S (speculation) for each of the statements (1–6), then find the words that indicate speculation. Have them check answers in pairs.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill

Have students read the paragraph **Recognizing Cause and Effect Relationships (3)**. Remind students that they have already learned about this concept in Units 3A and 10A, using key words such as *because*, *due to*, and *thus*. Often, the cause-and-effect relationship is not stated directly, so the reader needs to infer the relationship from the context.

A. Cause and Effect: Have students read the effects (1–6) and match them with their causes (a–g), using context from Reading A. One cause is extra. Check answers as a class.

Critical Thinking

Have students think about their opinion about space exploration, then choose the statement that best reflects how they feel. Have pairs compare answers, giving reasons for their ideas.

Vocabulary Practice

A. Completion: This passage is about contacting aliens by sending messages through space. Direct students' attention to the photo and caption next to activity A. Have students read the passage first, then circle the correct words to complete the information. Check answers as a class then choose a volunteer to read the completed passage aloud to the class.

- Question 1: *To date* means “until now” and synonyms include *so far*, *as yet*, and *up to the present (time)*.
- Question 3: Elicit from students that *scope* means “extent of” our own lifetimes.

B. Words in Context: Have students circle the correct words to complete the definitions. Check answers as a class.

C. Word Parts: Have students complete the sentences and check answers in pairs. If time allows, have students write a new sentence for each of the words in the box.

LESSON OVERVIEW

Target Vocabulary: *catastrophe, deflect, dilemma, engage, motor, nuclear, numerous, rotate, scenario, smash*

Reading Passage Summary: Most days, pieces of rock fall to the Earth from outer space. These meteorites are generally harmless. However, there is a real threat of a meteorite colliding with our planet one day, which could cause catastrophic damage. Scientists today are thinking of innovative ways of using technology to reduce the threat.

Answer Key

Before You Read

A. 1. crater; **2.** meteorite; **3.** diameter

B. 1. b (Para A); **2.** d (Para C); **3.** a (Para I);
4. c (Para K)

Reading Comprehension

A. 1. a; **2.** c (Para B); **3.** b (Para E); **4.** b; **5.** d (Para I)

B. 1. the Egyptian god of evil; **2.** a bruised hip and wrist; **3.** 85 kilometers wide; **4.** read newspapers outdoors; **5.** one in 45,000

Reading Skill

A. 1. b; **2.** a; **3.** a; **4.** a

B. 6. bigger than a sports arena;
3. grapefruit-sized; 4. the length of a car;
2. the size of an apple; 1. the size of grains of sand; 5. as big as a 15-story building

Critical Thinking

Possible answer(s): **Warn the public:** Pro: People could take steps to protect themselves. Con: If the public knew about it, they might panic and cause mass panic. **Consult experts while keeping it a secret:** Pro: People wouldn't know to panic, and hopefully the experts could divert the course of the asteroid. Con: The government might not hire the best "experts" to solve the problem. I think it would be best to keep it secret and hopefully find a way to change the course of the asteroid.

Vocabulary Practice

A. 1. Numerous; **2.** smashed; **3.** scenario;
4. catastrophic; **5.** deflected

B. 1. rotates; **2.** engage; **3.** dilemma; **4.** motor;
5. nuclear

C. 1. divided; **2.** Dialog; **3.** dilemma

TEACHING NOTES

Before You Read



A. Definitions: Have students read the captions and match the words in bold to the definitions (1–3). A small chunk of rock in space is called a *meteoroid*. It is called a *meteor* when it falls through a planet's atmosphere and is called a *meteorite* once it falls to the ground.

B. Scanning: Have students scan Reading B for the names of people (1–4), then match them to their descriptions (a–d). For Ed Lu, point out that the answer cannot be found at the first mention of the man's name; students will need to read on. Have students check answers in pairs.

Reading Comprehension



A. Multiple Choice: Have students read the entire passage silently and then answer the questions. Alternatively, play the audio and have students read along. Check answers as a class, asking students to give evidence for their answers using paragraph references from the passage.

- Question 3: Students will need to find the date of each impact mentioned. The impact at Sylacauga occurred in 1954, Tunguska in 1908, Chesapeake Bay, 35 million years ago, and the Gulf of Mexico, the oldest, 66 million years ago.
- Question 4: The *gap* refers to "no early-warning system." When that gap closes (or is filled), we can detect more potential threats.

B. Short Answer: Remind students that they learned about scanning for information with short answer questions in the reading skill in Unit 1B. If necessary, have students turn back to that section of the Student's Book and review this skill again. Have students scan the passage for answers to the questions. Have students check answers with a partner.

Additional comprehension questions are available for download on the *Reading Explorer* website.

Reading Skill 15-20 MINS

Have students read the paragraph **Interpreting Analogies**. Analogies are important because they give the reader a better idea of what big numbers actually mean.

A. Interpreting: Have students read the analogies and choose the best description (a or b). In sentence 1, a refrigerator probably weighs about 200 pounds. In sentence 4, a movie is about two hours long.

B. Interpreting: Have students rank the phrases in order from 1 (smallest) to 6 (largest). Check answers as a class. Have students give examples of the size of each item.

Critical Thinking 10-15 MINS

Have students read the question and discuss the pros and cons of both situations with a partner. Have pairs share their ideas with the class.

Vocabulary Practice 20-30 MINS

A. Completion: This paragraph is about theories of how our moon was formed. Direct students' attention to the photo and caption next to activity A. Have students read the information first, then use the words from the box to complete the paragraph. Check answers as a class and then choose a volunteer to read the completed paragraph aloud to the class.

- Question 4: Elicit the strength of the adjective *catastrophic* and point out that it means *disastrous, cataclysmic, devastating, ruinous*.
- Question 5: Explain the difference between *deflect* (change direction after hitting something) and *reflect* (to bounce light back).

B. Completion: Have students complete the sentences with the correct form of the words and then compare answers in pairs.

- Question 1: Elicit the noun form of *rotate* (*rotation*).
- Question 2: Point out that *engage* can be a formal word used to mean "start fighting against," but it is often used to mean "start talking with" or "show interest in." *Engaged* is also used as an adjective to describe two people who have agreed to marry.

C. Word Parts: The prefix *bi-* can also mean "two" (*bicycle, bilingual, biannual*). Have students complete the sentences and share answers with a partner. One word is extra. If time allows, have students write a new sentence for each word in the box.

Video Summary: This video is about meteors and what happens when they fall into Earth's atmosphere.

Key Vocabulary: *debris, mystical, streak*

Answer Key

Before You Watch

A. Possible answer(s): they happen regularly; they're also called shooting stars; they are pieces of rock; they are brilliant and bright.

B. 1. b; **2.** c; **3.** a

While You Watch

A. b, c, d

B. 1. T; **2.** F (It heats up.); **3.** T; **4.** NG; **5.** T; **6.** NG

Critical Thinking

Possible answer(s): 2, 3, 1; I think asteroids present a real danger to the future of our planet. If Earth were to be hit with a large enough asteroid, we would become extinct like the dinosaurs, so I think it's the most important issue to concentrate on.

While You Watch

A. Gist: Play the video. Have students check the topics that were covered, then check answers in pairs.

B. Evaluating Statements: Have students read the statements and choose T (true), F (false), or NG (not given) before watching the video again. Play the video again and have students check answers in pairs, correcting any false statements.

Critical Thinking

Have students read the projects and rank them in order from 1–3 (1 = most important; 3 = least important). Then have students discuss their ideas with a partner, giving reasons for their answers.

Vocabulary Review

Have students work individually to check their understanding of the unit's target vocabulary. If time allows, have students write an example sentence with each word. Ask for volunteers to read their completed sentences aloud to the class.

Additional vocabulary practice questions are available for download on the *Reading Explorer* website.

TEACHING NOTES

Before You Watch

A. Discussion: Direct student's attention to the photo and caption on page 219. Have students answer the question and discuss their ideas with a partner.

B. Previewing: Have students read the information and match the bold words to their definitions (a–c). Then have students compare their ideas with a partner.