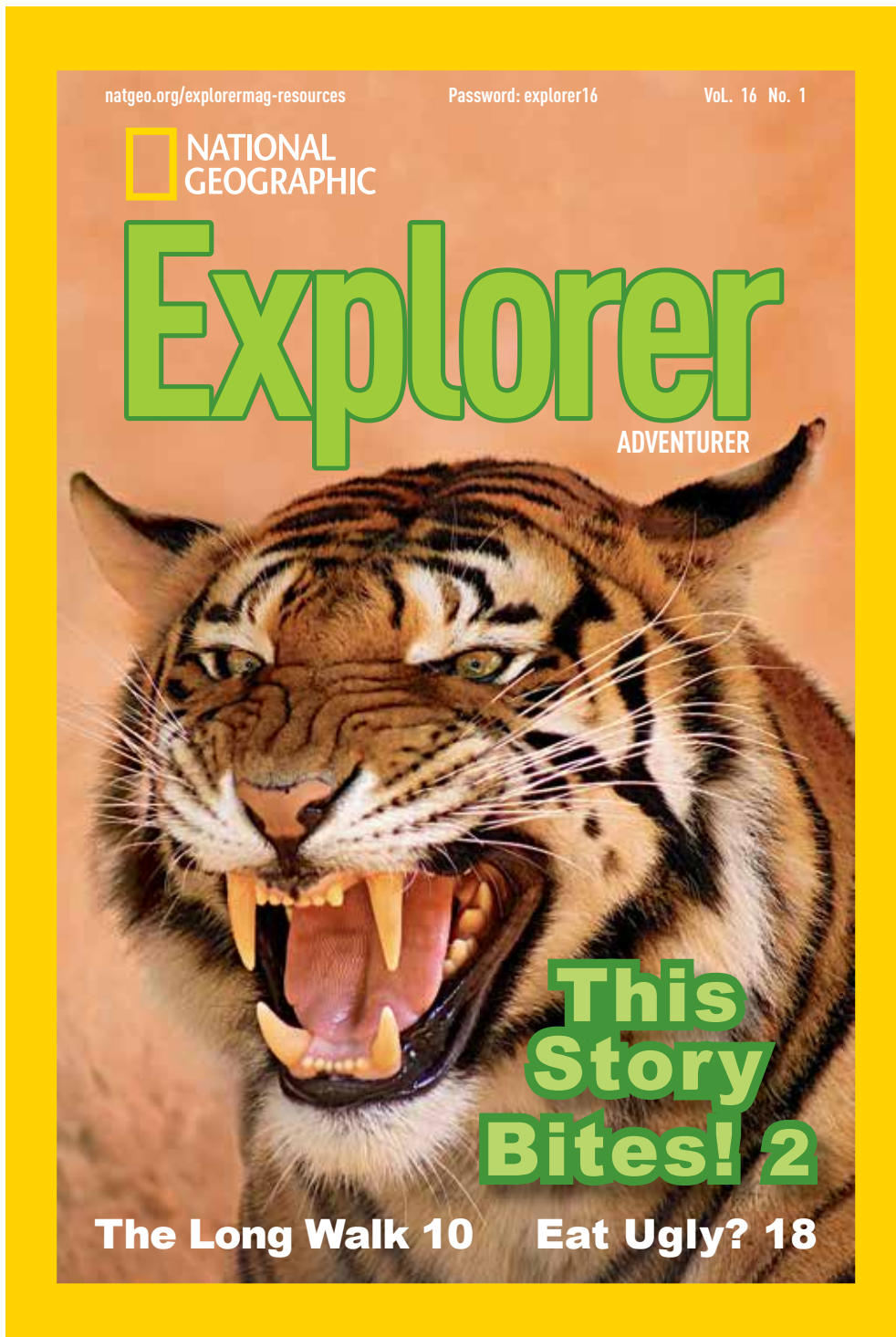


TEACHER'S GUIDE

Adventurer

September 2016



In This Guide

This guide contains language arts and science lessons for articles in the September 2016 issue of EXPLORER ADVENTURER.

Explorer Magazine

EXPLORER classroom magazines are specifically written for each grade, 2-5. Through great storytelling and stunning photographs, the EXPLORER magazines develop literacy skills and teach standards-based science content.

The EXPLORER magazines strive to offer a variety of reading experiences for students with different ability levels in the same class. Thus, all articles have been measured using the Lexile® Framework for Reading. Some articles will be easier to read than others, but all articles in EXPLORER ADVENTURER will be within the 520-950L range.

EXPLORER is part of NATIONAL GEOGRAPHIC EXPLORER'S Education program. For more resources, visit the "For Teachers" tab on EXPLORER'S website, natgeo.org/explorermag-resources.

Your Subscription Includes:

- Magazines
- Classroom Posters
- Projectable Magazine
- Interactive Whiteboard Lesson
- Teacher's Guide
- App (additional subscription required)

Objectives

- Students will use context clues to understand the meaning of unfamiliar words.
- Students will explain concepts based on information in the text.

Resources

- Vocabulary Assessment Master (page 6)
- Language Arts Assessment Master (page 7)

Summary

- The article “This Story Bites!” introduces students to animals that use their teeth in different ways and explains how various types of teeth help animals survive.

BUILD VOCABULARY AND CONCEPTS

- **canine**
- **enamel**
- **fang**
- **incisor**
- **molar**
- **tusk**

Display the vocabulary words on a word wall or on the whiteboard. Point out to students that when they read they will encounter words they don't know. Remind them that using context clues such as the sentences before and after an unknown word and photographs on the page can help them figure out what the unfamiliar word means.

Give each student a copy of the **Vocabulary Assessment Master**. Instruct students to record each vocabulary word from the article. Have them scan the article to locate each bold word in the text.

Tell students to record text and photo clues from the article that are related to each word. Then have each student record his or her own idea about what each word means. Invite volunteers to read aloud the definitions in the Wordwise feature on page 7. Invite students to compare the definitions they wrote with those in the text. Discuss how context clues helped them understand the meaning of each word.

READ

Inform students that the purpose of this article is to introduce them to animals with different kinds of teeth. After reading the article, they will understand how animals use their teeth and why different types of teeth are used in different ways .

Display pages 2-3 of the projectable magazine. Invite a volunteer to read aloud the headline and text. Discuss the meaning of any words that students are unfamiliar with. Then point out that the images on the screen show four different animals and all four animals have different types of teeth. **Say:** *Not all teeth are the same. Teeth come in many different sizes and shapes. Some, like the elephant's two large tusks, even stick outside of the animal's mouth.*

Revisit the words in the text on the screen. Point out to the class that each type of tooth has a purpose. **Ask:** *Which of these teeth do you think can bite, chomp, or gnaw? Which can chew, crunch, or mince? What else can these animal teeth do?* Encourage students to share their opinions. As a class, compare the actions of various teeth to everyday objects students are familiar with.

Give each student a copy of the **Language Arts Assessment Master**. Have students read the article on their own. As they do, instruct them to record each type of animal identified in the article and the everyday object that its teeth are compared with. Challenge them to them explain why the comparison makes sense.

This Story Bites!

LANGUAGE ARTS

TURN AND TALK

Have students turn and talk to discuss what they learned about teeth. **Ask:** *Why does the article describe a crocodile's teeth as pinchers?* (They grab and clamp down on things.) *Why does it say a snake's teeth are like a syringe?* (They're hollow and work like a needle when a doctor gives a shot.) *What kind of teeth are good at grinding and chewing?* (molars, or wide, flat teeth) Invite students to share what else they learned about teeth.

• **Explain Concepts** Point out to students that when they read articles on scientific topics, they may encounter new ideas or concepts. But just because the information is new doesn't mean it has to be hard to understand. **Say:** *The best way to figure things out is to ask questions as you read. What happened? Why did it happen? How is one thing related to another? You can usually find the answer to each of your questions right there in the text.* Point out that a good way to test your understanding of a topic is to try to explain the ideas to someone else. **Say:** *If you can't explain the concept, you might need to read the article again.* Have students turn and talk to share their **Language Arts Assessment Masters** with a partner. Can they explain their answers clearly? Do their answers and explanations make sense? If not, instruct partners to reread the text and revise their answers accordingly. Then prompt discussion with questions such as: *Why are a beaver's teeth orange?* (Iron forms an orange enamel on the front of their teeth.) *How can a narwhal's tooth "taste" water?* (It isn't coated with enamel. Water passes right through it.) *Why are an elephant's tusks considered to be a multi-purpose tool?* (Elephants can do many different things with their tusks.)

WRITE AND ASSESS

You may want students to write about what they learned to assess understanding. Encourage students to reflect upon what they read and how it affected their ideas about the topic.

- *Why are incisors good teeth for cutting?*
- *Why is the sulawesi babirusa's tusk a mystery?*
- *What surprised you about what you read?*

SCIENCE

Objectives

- Students will compare and contrast different types of teeth.
- Students will understand how animals use their teeth to survive in their environments.
- Students will recognize the unique characteristics of some animals' teeth.

Resources

- Content Assessment Master (page 8)
- "Tooth Tales" poster (Teacher's Edition; pages 8-9 in Student Edition)
- Comprehension Check (page 9)
- "This Story Bites!" Interactive Whiteboard (optional)

Science Background

Teeth are bone-like structures found in most animals' mouths. They form in the gums inside the jaws. Teeth are an important body part that help animals survive in their environment.

There are four different type of teeth:

- incisors: front teeth that can cut food;
- canines: sharp, pointed teeth that can stab;
- premolars: teeth behind the canines that may cut, crush, or grind; and
- molars: large, wide, flat teeth in the back that grind and chew.

One important job of teeth is to help animals catch and eat food. Animals that eat different types of food have different types of teeth. Carnivores, or meat eaters, have sharp teeth. Herbivores, or plant eaters, have flat teeth. Omnivores, which eat both meat and plants, have sharp teeth in the front and flat teeth in the back. And insectivores, which are animals that eat insects, have square teeth with sharp points.

Teeth are important for eating, but they help animals survive in other ways, too. Animals may use their teeth to dig, lift, or carry. They can use their teeth when they fight. Teeth can even be an anchor. Walrus jab their large canine teeth into the ice when they sleep!

ENGAGE

Tap Prior Knowledge

Instruct students to each think of an animal. Invite volunteers to describe their animal's teeth. Compare and contrast the results. As a class, discuss reasons why animals might have different types of teeth.

EXPLORE

Preview the Lesson

Display pages 2-3 of the projectable magazine. Have students examine the photos. Then invite a volunteer to read aloud the headline and deck. **Ask:** *Based on the information here, what do you think this article is about? (teeth) Why? (The photos are all show the animals' teeth. The words in the headline and deck identify things teeth can do.)* Point out the ellipse at the end of the deck. Challenge students to explain why the ellipse is there. (It indicates that the list goes on. Teeth can do more than what's listed here.) Inform students that they'll learn more about what teeth can do and how those actions help animals survive as they read the article.

Set a Purpose and Read

Have students read the article in order to compare and contrast different types of animal teeth, understand how animals use their teeth to survive in their environments, and recognize the unique characteristics of some animals' teeth.

EXPLAIN

Compare and Contrast Animal Teeth

As a class, review the images in the article. Encourage students to offer brief descriptions of the different types of animal teeth. Tell them to think about what the teeth look like as well as what the teeth can do. Then give each student a copy of the **Content Assessment Master**. Instruct students to select three animals from the article. Tell them to record ways that the animals' teeth are alike and different. Challenge them to identify one way all three animals' teeth are the same. (Each of the animals uses its teeth to survive.)

SCIENCE

EXPLAIN

(continued)

How Teeth Help Animals Survive

Display pages 4-5 of the projectable magazine. Point out the large purple word *tool*. Discuss what a tool is. (an instrument that helps you do work) Then discuss reasons why people use tools. (Tools make it easier to get jobs done.) **Say:** *Sometimes it's impossible to do a job if you don't have the right tools.* Remind students that teeth are an important tool for animals. Animals use their teeth to do many different things. **Say:** *The right kind of teeth helps animals do what they need to do so they can survive.* Divide the class into small groups. Instruct groups to analyze the information in each section and then write a brief explanation telling how each animal's teeth help it survive. Encourage students to use information they collected on their **Language Arts Assessment Masters** and **Content Assessment Masters** as a guide. Rejoin as a class to share and compare results.

Recognizing Unique Animal Teeth

Display "**Tooth Tales**" poster. Read aloud the headline and deck. Then invite volunteers to read aloud each fact. Discuss how each fact could help the animal in question survive where it lives.

ELABORATE

Find Out More

Remind students that scientists think the narwhal uses its tooth to "taste" the water. Point out that the article states that this helps narwhals get a sense of how salty the water is. But the article doesn't explain why this is important or how knowing the salt-content of water helps narwhals survive. Assign each student a partner. Instruct pairs to conduct research. Challenge them to discover how the narwhal's tooth helps it survive.

Extend Your Thinking About Teeth

Point out to students that the article identified many different ways animals use teeth as tools. But these are just a few examples. Divide the class into small groups. Instruct groups to conduct research to discover other ways animals use teeth as tools. Challenge each group to find at least two new examples.

EVALUATE

Have students record their answers to the assessment questions in their science notebooks or on a separate sheet of paper.

- *What can a crocodile do with its pointed teeth? (grab and hold onto)*
- *How does the Sloane's viperfish eat since its teeth don't fit inside its mouth? (It swallows prey whole.)*
- *Why are teeth important tools for most animals? (Teeth help animals survive in their environments.)*

If you wish, have students complete the **Comprehension Check** to assess their knowledge of concepts mentioned in the article. You may also wish to examine the optional **Interactive Whiteboard** lesson that accompanies this article.

Name _____

Date _____

VOCABULARY ASSESSMENT: This Story Bites!

Record information from the article about each vocabulary word.

Word						
Text Clues						
Photo Clues						
What I Think the Word Means						
Definition						

LANGUAGE ARTS ASSESSMENT: This Story Bites!

Identify the everyday object each animal's teeth are compared to.
Explain why the comparison makes sense.

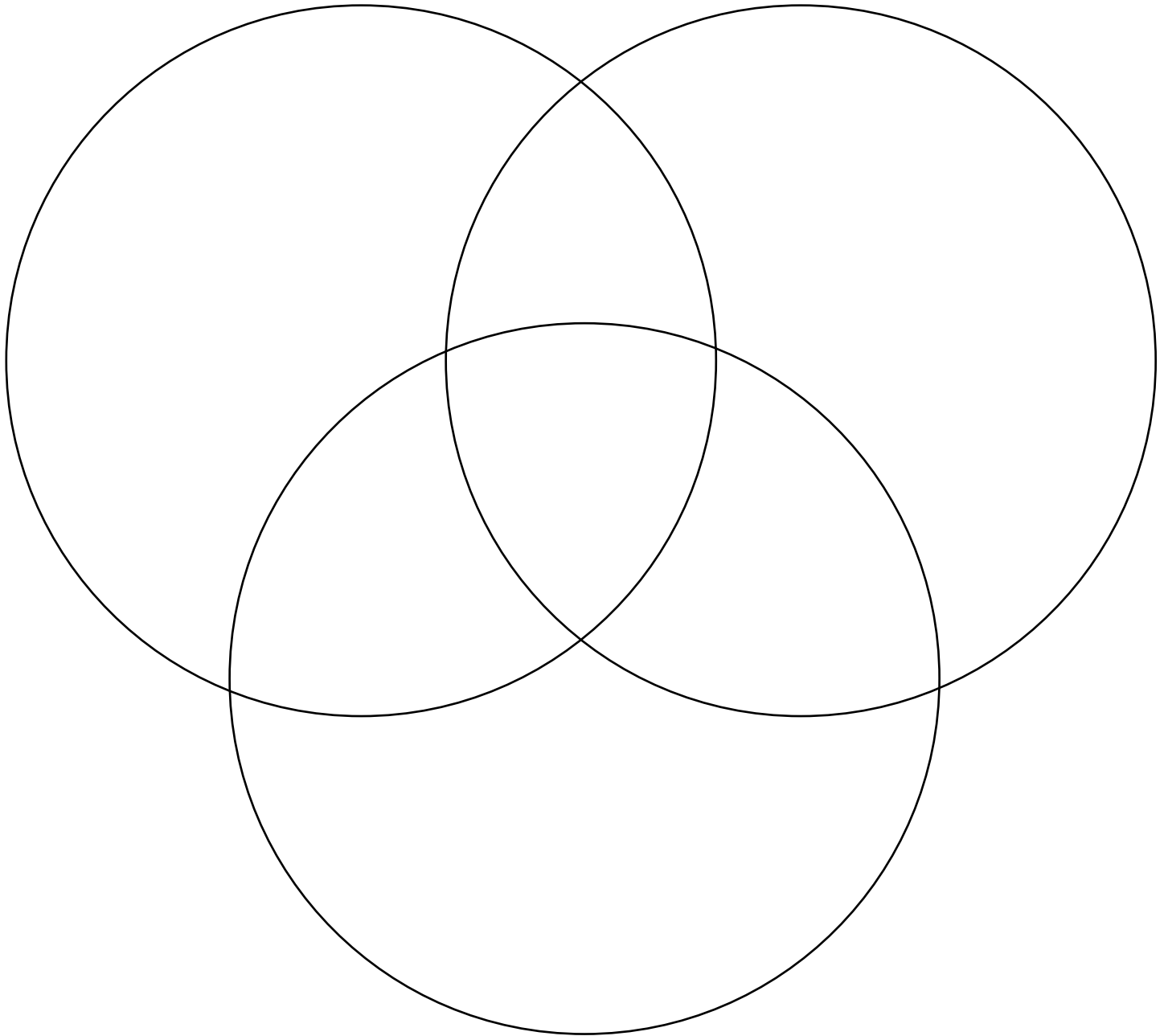
	Identify	Explain
elephant		
crocodile		
Sloane's viperfish		
green bush viper		
great white shark		
beaver		
naked mole rat		
narwhal		
sulawesi babirusa		

CONTENT ASSESSMENT: This Story Bites!

Pick three animals from the article. Use this diagram to compare and contrast their teeth. Then tell how all three animals' teeth are alike.

Animal: _____

Animal: _____



Animal: _____

COMPREHENSION CHECK: This Story Bites!

Read each question. Fill in the circle next to the correct answer or write your response on the lines.

1. What can a shark do with its teeth?

- Ⓐ cut
- Ⓑ grind
- Ⓒ lift

2. Which naked mole rat uses its teeth to break through the soil?

- Ⓐ the sweeper
- Ⓑ the digger
- Ⓒ the volcanoer

3. Which animal has enamel made out of iron on its teeth?

- Ⓐ narwhal
- Ⓑ crocodile
- Ⓒ beaver

4. Which animal's teeth are a multi-purpose tool?

- Ⓐ elephant
- Ⓑ green bush viper
- Ⓒ sulawesi babirusa

5. Pick one animal from the article. Describe its teeth. Explain how teeth help it survive.

The Long Walk

LANGUAGE ARTS  LEXILE 520L

Objectives

- Students will identify and investigate the definitions of unfamiliar words.
- Students will identify the main idea of the article and each section and summarize what they read.
- Students will explain concepts based on information in the text.

Resources

- Vocabulary Assessment Master (page 14)
- Language Arts Assessment Master (page 15)

Summary

- The article “The Long Walk” takes students on a 16,000 kilometer walk with National Geographic explorer Sarah Marquis as she explores the landscape from Siberia to Australia.

BUILD VOCABULARY AND CONCEPTS

Display pages 16-17 of the projectable magazine. Point out that there is no Wordwise feature in this article. **Say:** *That doesn't mean, however, that there will be no unfamiliar words in the article.*

Give each student a copy of the **Vocabulary Assessment Master**. As students read the article, instruct them to record each word they find difficult to understand. **Say:** *These may be words you've never seen before or they may be words you do know that are used in a new way.*

Tell students to circle three words on their lists. Have them predict and write a definition for each word. Next, have them write a sentence using each word, based on the definitions they wrote. Then have students find each word in a dictionary and record its definition. If a word has multiple meanings, have students use context clues in the article to select the correct definition. Have students write a new sentence based on the definition they found.

Invite volunteers to identify the words they defined and read aloud the before and after sentences they wrote. As a class, examine how investigating definitions contributed to students' understanding of each word.

READ

Give students a few minutes to scan the article in their magazines. **Then ask:** *What do you think this article is about? Why?* Encourage students to share their ideas.

Explain to students what they just attempted to identify was the main idea or overall topic of the article. Tell students that everything in the article is connected to the main idea. Each section has a main idea. Everything in a section is connected to the main idea of that section.

Display pages 10-11 of the projectable magazine. Model how to identify the main idea of the article.

Say: *To figure out what this article is about, I need to look for clues. The first clues are the photos. In the larger photo, I see a woman. In the smaller photo, I can see that she's walking. The headline tells me it's a long walk. Based on these clues, it's pretty obvious that the article is about the woman's trip, but where is she going? What is the point of her trip?* Invite a volunteer to read aloud the deck. **Say:** *This is extremely useful information! Now I know the main idea. This article is about Sarah Marquis' trip from Siberia to Australia. As I read the article, I'm sure I'll read lots of exciting details about her trip!*

Have students read the article on their own. As students read, encourage them to search for details that support the main idea of the article.

The Long Walk

LANGUAGE ARTS

TURN AND TALK

Have students turn and talk to discuss what they learned about how Marquis' trip. **Ask:** *How long was her trip? (16,000 kilometers) How long did it take? (three years) Was this her first long trip? (No. She has also walked from Canada to Mexico, around Australia, and across the Andes Mountains in South America.)*

- **Identify Main Ideas** Remind students that the article has a main idea. But each section has its own main idea, too. Explain that they can find the main idea of a section the same way they found the main idea of the article. They search for important clues. Give each student a copy of the **Language Arts Assessment Master**. Instruct students to write the title and record the main idea of the article. (Sarah Marquis walked alone from Siberia to Australia.) Then assign each student a partner. Have pairs select seven sections. Instruct them to record the subhead for each section they chose and then skim the text to determine the main idea of each one. Once partners are finished, have them share what they learned with another pair. Instruct pairs to work together to analyze all of their information and write a brief summary of the article.

- **Explain Concepts** After reading the article, **say:** *One way to see if you understand information is to try to tell someone else about the topic. If you can't explain the concept, you might need to read the article again.* Have students turn and talk to explain to a partner how Marquis prepared for her trip and how she stayed safe while on her journey. Prompt discussion with questions such as: *How does Marquis know where she's going?* (She studies detailed maps to plan the best route.) *How does she limit the amount of supplies she has to carry?* (She organizes food and gear refills along the way before she leaves.) *What does everything she takes have in common?* (It's all essential to her survival.)

WRITE AND ASSESS

You may want students to write about what they learned to assess understanding. Encourage students to reflect upon what they read and how it affected their ideas about the topic.

- *Why does Marquis study the languages and cultures of the countries she's traveling through?*
- *Why does she walk alone?*
- *What surprised you about what you read?*

The Long Walk

SCIENCE

Objectives

- Students will learn about the people and places Marquis visited.
- Students will understand how people's everyday activities affect the places where they live.

Resources

- Content Assessment Master (page 16)
- Comprehension Check (page 17)

Science Background

National Geographic explorer Sarah Marquis set out on her first venture when she was just eight years old. Accompanied by her dog, the Swiss native decided to spend the night in a cave she'd discovered—without telling her mother!

Since then, Marquis' treks have been both longer and more organized. In 2000, it took her four months and six days to walk across the U.S. from the Canadian border to Mexico. Two years later, she began a 17-month-long trek around the Australian continent. In 2006, she spent eight months walking through the Andes. And in 2010—on her 38th birthday—she departed Siberia en route to Australia.

Planning a trip like this can take years. Marquis studies topographic maps to outline her route and identify locations where she can replenish supplies. And she packs gear suitable for the variety of environments she'll encounter. Once she's on her way, she contacts people at home via a GPS device to let them know she's safe.

While extended ventures like these might not be for everyone, Marquis says the expeditions give her an "unbelievable connection with nature." And reporting on them makes her feel like "a little bridge between humans and nature."

ENGAGE

Tap Prior Knowledge

Instruct students to imagine that they could go anywhere in the world. Now tell them to imagine that they had to walk to get there. How long do they think it would take? What do they think they'd see along the way? Invite volunteers to share details about their adventures.

EXPLORE

Preview the Lesson

Display pages 10-11 of the projectable magazine. Read aloud the headline and deck. **Ask:** *What is this article about?* (a long walk) *Where did this walk start?* (Siberia) *Where did it end?* (Australia) Brainstorm a list of things the adventurer might have seen along the way.

Set a Purpose and Read

Have students read the article in order to learn about the people and places Marquis visited and to understand how people's everyday activities affect the places where they live.

EXPLAIN

Recognizing Characteristics

Instruct students to examine the article's photos in their student magazines. Invite volunteers to describe some of the landscapes they see. Guide the class to recognize that the writer went on an extremely long trip. Because of this, she encountered a wide variety of cultures and environments along the way. Assign each student a partner. Encourage students to review the article for details about each place and culture Marquis visited. Instruct them to summarize what they learned. Rejoin as a class to have pairs share their insights on the people and places Marquis encountered during her trip.

SCIENCE

EXPLAIN

(continued)

Understanding How People Impact Places

Display pages 12-13 of the projectable magazine. Zoom in on the photo of Marquis' cart. Point out the collection of smashed aluminum cans. **Say:** *As Marquis traveled, she could have tossed those cans aside. Instead, she strapped them to her cart and brought them along.* **Ask:** *Why do you think she did this?* Invite volunteers to share their opinions. Guide students to recognize that Marquis didn't want to change the environment by polluting it with aluminum cans. **Say:** *People's actions can change the world around them. Sometimes the changes are good and sometimes they're not. Marquis encountered examples of each when she took her long trip.* Give each student a copy of the **Content Assessment Master**. Instruct students to select three places Marquis went. Have them describe some of the everyday activities of people in each place and explain how those activities impact the area where the people live.

ELABORATE

Find Out More

Display pages 12-13 of the projectable magazine. Zoom in on the section "Step by Step." Point out to the class that this isn't Marquis' first long trip. She's also traveled from Canada to Mexico, around Australia, and across the Andes Mountains into South America. Instruct students to conduct research to learn more about Marquis and her adventures. Invite them to share what they learned with the class.

Extend Your Thinking About Venturing

Remind students that Marquis travels into remote parts of the world by herself for extended periods of time. As a class, list potential pros and cons of traveling like this. Discuss how sharing what she learns as she travels could impact the way people interact with the world around them.

EVALUATE

Have students record their answers to the assessment questions in their science notebooks or on a separate sheet of paper.

- *Why does Marquis dress like a man when she travels?* (to stay safe)
- *What essential gear does she take?* (clothing, a backpack, a cart, walking shoes, camping equipment, a tent, maps, food, and water)
- *Why did it take Marquis three tries to cross the Gobi Desert?* (She had an infected tooth and had to go to the hospital. Then there was a blizzard. She made it on her third try.)

If you wish, have students complete the **Comprehension Check** to assess their knowledge of concepts mentioned in the article.

VOCABULARY ASSESSMENT: The Long Walk

Record unfamiliar words from the article. Circle three words on the list.
Use the organizer to investigate the meaning of those words.

Unfamiliar Words			
Word			
Predicted Definition			
Sentence			
Dictionary Definition			
Sentence			

LANGUAGE ARTS ASSESSMENT: The Long Walk

Record the headline and main idea of the article. Select seven sections.
Record the subhead and main idea of each. Summarize the text.

Article Headline	Main Idea
Subhead	Main Idea
Summary 	

Name _____

Date _____

CONTENT ASSESSMENT : The Long Walk

Pick three places Marquis visited. Describe everyday activities of people in each place. Explain how these activities impact the area where the people live.

	Place:	Place:	Place:
Describe			
Explain			

COMPREHENSION CHECK: The Long Walk

Read each question. Fill in the circle next to the correct answer or write your response on the lines.

1. On which continent did Marquis begin her journey?
 A Asia
 B Africa
 C Australia
2. Which of these items did Marquis take on her trip?
 A a bicycle
 B a boat
 C a cart
3. Why does each tribe in the Sichuan Mountains have its own language and culture?
 A The tribes refuse to communicate with each other.
 B The people live far from modern-day cities.
 C The languages are hard for outsiders to learn.
4. Where did Marquis see evidence that people had polluted the environment?
 A **in the** Gobi Desert
 B **in** Kunming, China
 C along the Mekong River

5. Explain why Marquis takes such long walks.

Objectives

- Students will record and define vocabulary words and create a diagram to show how the words are alike and different.
- Students will use details and examples to make inferences about the text.

Resources

- Vocabulary Assessment Master (page 22)
- Language Arts Assessment Master (page 23)

Summary

- The article “Eat Ugly?” introduces students to the problem of worldwide food waste and explores possible solutions.

BUILD VOCABULARY AND CONCEPTS

- **developed nation**
- **developing nation**

Display the Wordwise feature on page 22 of the projectable magazine. Invite volunteers to read aloud the words and their definitions. Encourage students to share what they know about each word.

Give each student a copy of the **Vocabulary Assessment Master**. Instruct students to record each word and its definition. Discuss how the vocabulary words are related. Then challenge students to create a diagram that illustrates how the words are alike and different. Invite students to share their ideas with the class.

READ

Let students know in this article they will read about the problem of worldwide food waste. They will also explore potential solutions.

Tell students that as they read, they will come across many facts that are stated clearly in the text. These facts are explicit statements. But they will also encounter clues that require them to make an educated guess, or inference. To do this, they must combine what the text says with what they know to reach a logical conclusion.

Instruct students to examine the produce in the photo. **Say:** *When I look at this photo, I know that I'm looking at fruits and vegetables. But they don't look like the fruits and vegetables I usually see in the store.* Read aloud the headline. As you do, be sure to use a questioning tone of voice. Then model how to identify explicit statements and make an inference. **Say:** *This headline clearly states that these fruits and vegetables are "ugly." This is an explicit statement. The headline also explicitly states that this produce can be eaten. But there's more to the headline than that. It's questioning whether or not you would or should eat this produce. The only time I don't eat produce is if it has gone bad. The inference this causes me to make is that possibly ugly foods are also bad and shouldn't be eaten.* Invite a volunteer to read aloud the text above the introduction. **Say:** *This is also an explicit statement and it proves that many other people make this same inference: Ugly food is bad food. To understand why so many people think this, I'll need to read the article.*

Give each student a copy of the **Language Arts Assessment Master**. Instruct students to read the article on their own. As they do, instruct them to write one explicit statement and make one inference for each section of the article. As they record their ideas, tell them to be sure to quote accurately from the text.

LANGUAGE ARTS

TURN AND TALK

Have students turn and talk to discuss what they learned about wasted food. **Ask:** *How much food is wasted each year?* (about 1.3 billion metric tons) *What causes food to be wasted?* (what it looks like; how its grown, processed, and shipped) Encourage students to share other interesting facts they learned about wasted food.

• **Make Inferences** Remind students that making inferences is a strategy to help them understand what they read. **Say:** *Understanding what you just read is important. But interpreting information from a writer's clues takes practice. If you can't follow the clues, you might need to reread the text.* Have students compare their **Language Arts Assessment Masters** with a partner. Did students identify the same explicit statements? Did they find the same clues? If so and they developed different inferences, encourage students to review the text once again. Challenge students to show their partners where in the article they found the information to reach each conclusion as they explain the inferences they made after reading the text.

WRITE AND ASSESS

You may want students to write about what they learned to assess understanding. Encourage students to reflect upon what they read and how it affected their ideas about the topic.

- *What is the difference between a developed nation and a developing nation?*
- *Which solution from the article do you think is the best way to keep people from wasting so much food?*
- *What surprised you about what you read?*

SCIENCE

Objectives

- Students will understand why wasted food is a worldwide problem.
- Students will recognize that people can reduce food waste by changing their lifestyles and actively participating in solutions.

Resources

- Content Assessment Master (page 24)
- "Reducing Waste" poster (Teacher's Edition; page 23 of Student Edition)
- Comprehension Check (page 25)

Science Background

In many parts of the world, people don't think twice before they scrape the scraps from their dinner plate into the trash can. But according to the Food and Agricultural Organization (FAO) of the United Nations, this and other wasteful habits add up. In fact, people discard nearly 1.3 billion metric tons of food—or enough to feed three billion people—each year.

Food is discarded from the food chain in two distinct ways. It can be lost or wasted.

Lost food disappears when it is thrown away during harvesting, shipping, or processing. This is common in developing countries that lack the resources and infrastructure to keep food fresh. Food is wasted when retailers or consumers throw it away. This is common in developed countries, where food supplies are more abundant.

Some corporations are changing their practices to fix these problems in the food chain. But individuals can help, too. By changing their habits at the store, in restaurants, at home, and in the larger community, people can chip away at their food waste footprints.

ENGAGE

Tap Prior Knowledge

Prior to conducting this activity, collect two samples of the same fruit or vegetable. One sample should be perfect. The other sample should be misshapen in some way. Display the produce for the class. Take a poll to see which sample students would rather eat. Discuss why.

EXPLORE

Preview the Lesson

Instruct students to turn to page 19 of their student magazines. Invite a volunteer to read aloud the text above the introduction. Discuss reasons why this is a big problem.

Set a Purpose and Read

Have students read the article in order to understand why wasted food is a worldwide problem and to recognize that people can reduce food waste by changing their lifestyles and actively participating in solutions.

EXPLAIN

Understanding the World Food Problem

Display page 19 of the projectable magazine. Zoom in on the final paragraph and invite a volunteer to read that text aloud. **Say:** *There are nearly 800 million hungry people in the world. But about a third of our food goes to waste.* Discuss the irony of this situation. Then display page 20 of the projectable magazine. Invite volunteers to read aloud the section "Feeding the Hungry." As a class, discuss reasons why simply growing more food isn't the best way to solve the world food crisis.

SCIENCE

EXPLAIN

(continued)

Solving the World Food Problem

Display page 21 of the projectable magazine.

As a class, discuss the various ways fruits and vegetables are lost or wasted. Review the article to identify examples of how companies are changing their practices to conserve many of these lost or wasted foods. Then display the **"Reducing Waste" poster**. Have students follow along on page 23 of their student magazines as you examine how individuals can reduce the amount of food they waste, too. Give each student a copy of the **Content Assessment Master**. Based on what they've learned, instruct each student to create an advertisement that highlights the problem of wasted food and encourages people to reduce the size of their food waste footprint.

ELABORATE

Find Out More

Inform students that the article identified many different ways businesses have changed their practices so they waste less food. Divide the class into small groups. Instruct groups to conduct research on this topic. Challenge each group to identify one more example of a business that has changed its ways in an effort to waste less food.

Extend Your Thinking About Food

Remind students that the article stated that in some U.S. schools, children dump up to 40 percent of their lunches in the trash. Conduct a week-long experiment to see how much food your students dump. After all results are tallied, identify ways students can work together to reduce your school's food waste footprint.

EVALUATE

Have students record their answers to the assessment questions in their science notebooks or on a separate sheet of paper.

- *What kinds of foods are most likely to be lost or wasted?* (fruits and vegetables)
- *Where are four places people can find ways to reduce their food waste footprint?* (stores, restaurants, at home, in the community)
- *In which type of nation do people have the largest food waste footprint?* (developed nations)

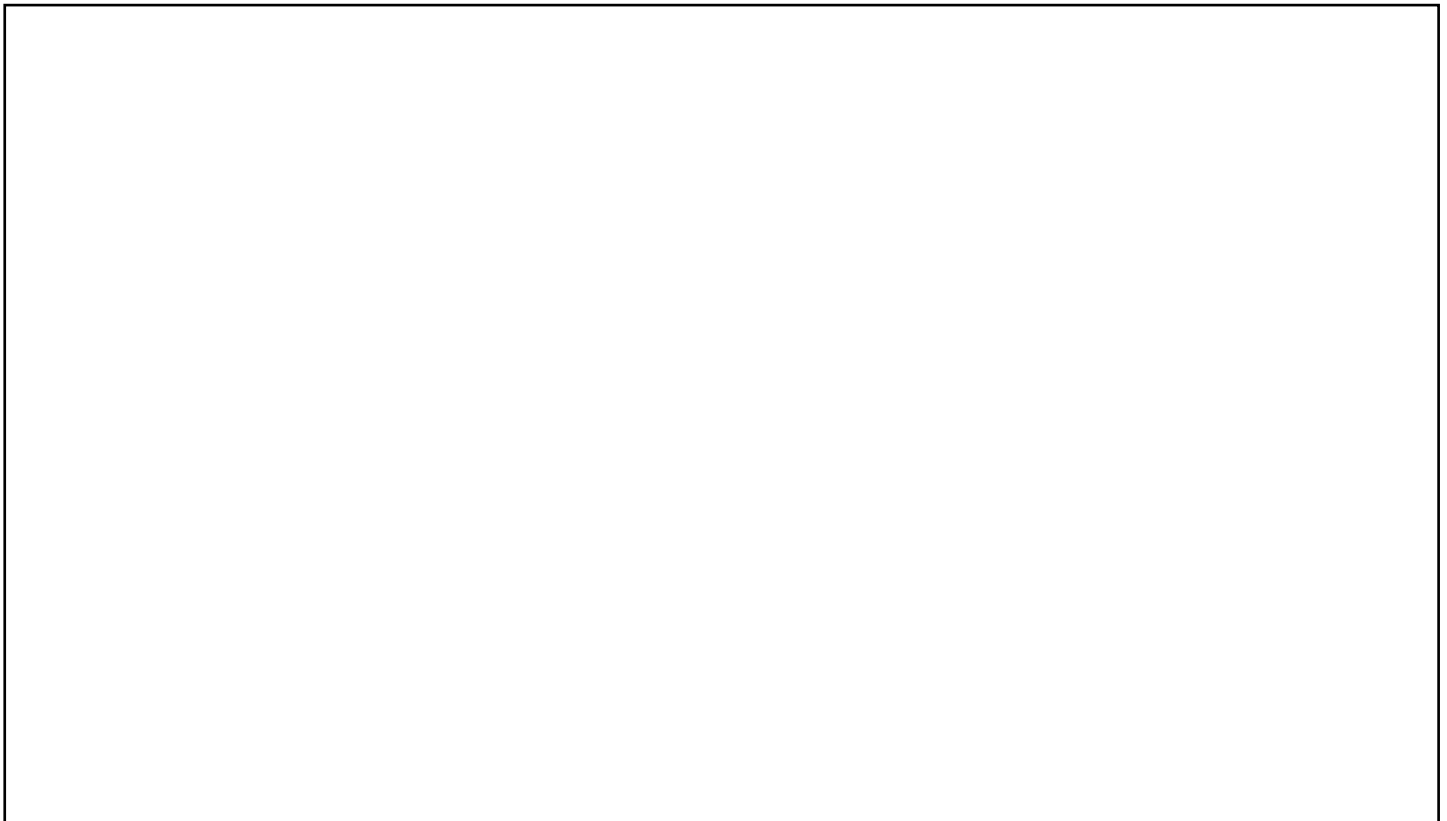
If you wish, have students complete the **Comprehension Check** to assess their knowledge of concepts mentioned in the article.

VOCABULARY ASSESSMENT: Eat Ugly?

Record each vocabulary word and its definition.

Word	Definition

Create a diagram that shows how the two words are alike and different.



LANGUAGE ARTS ASSESSMENT: Eat Ugly?

Record an explicit statement and make an inference from each section in the article.

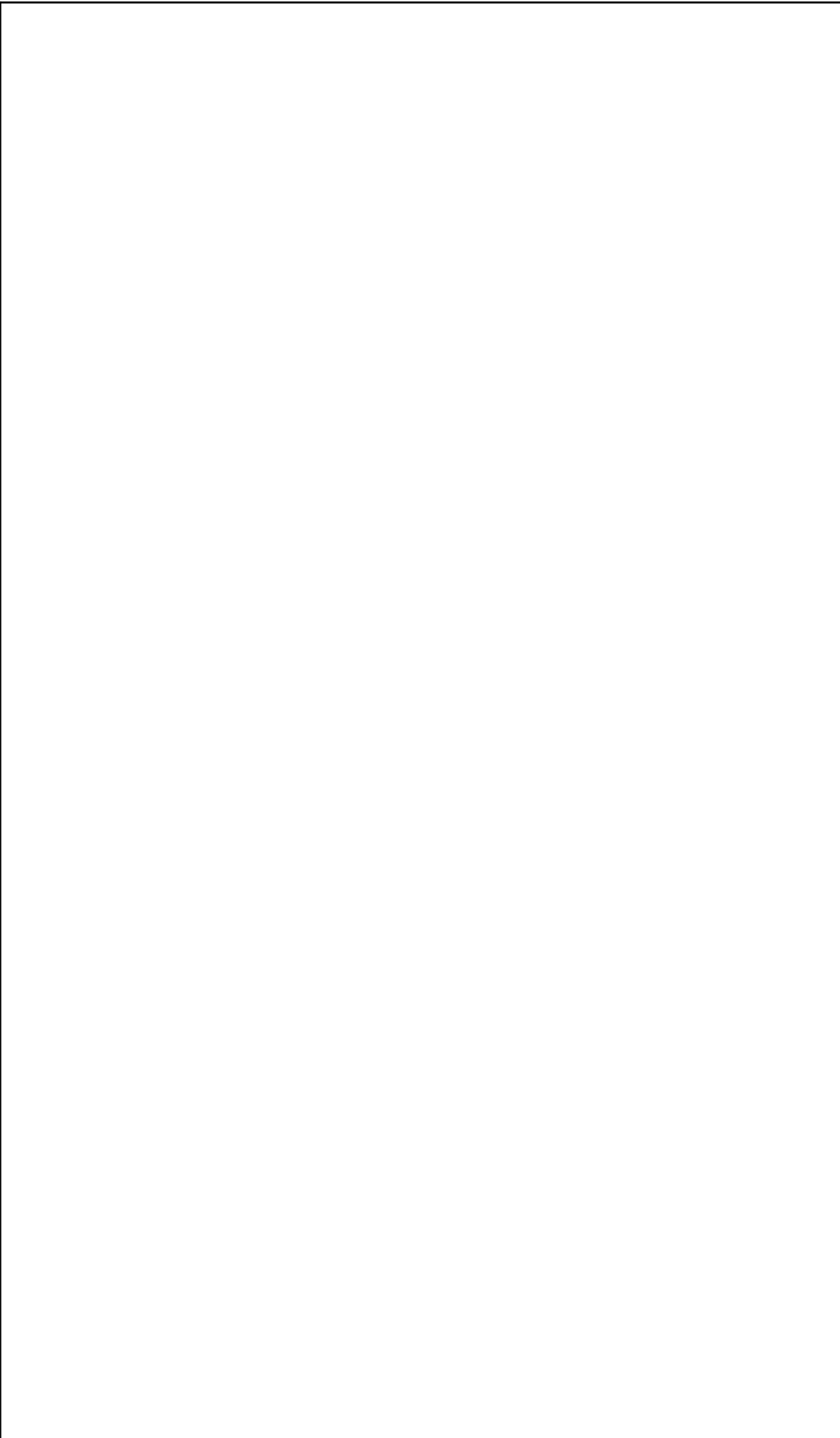
Explicit Statements		
1.		
2.		
3.		
4.		
5.		
Inferences		
What the Text Says	What I Already Know	Inferences I Can Make

Name _____

Date _____

CONTENT ASSESSMENT: Eat Ugly?

Create an advertisement that highlights the problem of wasted food and encourages people to reduce the size of their food waste footprint.



COMPREHENSION CHECK: Eat Ugly?

Read each question. Fill in the circle next to the correct answer or write your response on the lines.

1. According to this article, how much of the world's food goes to waste?
Ⓐ about half
Ⓑ about a third
Ⓒ about a fourth

2. About how many people worldwide suffer from hunger?
Ⓐ 8 million
Ⓑ 80 million
Ⓒ 800 million

3. What have people done to reduce the amount of food lost in developing countries?
Ⓐ given storage bins and multilayer grain sacks to farmers
Ⓑ developed juice products from less-than-perfect fruit
Ⓒ marked eggs with product information

4. What does it mean to "eat ugly"?
Ⓐ People eat rotten foods.
Ⓑ People eat imperfect foods.
Ⓒ People eat stinky foods.

5. Name three things you can do to reduce the size of your food waste footprint.

ANSWER KEY

This Story Bites!

Assess Vocabulary, page 6

Students should record the words and definitions from the Wordwise feature on page 7.

canine: a pointed tooth

enamel: the hard surface on a tooth

fang: a hollow tooth

incisor: a type of tooth in the front of the mouth for cutting

molar: a wide, flat tooth used for grinding and chewing

tusk: a long, curved tooth that sticks out of the mouth

Text clues, photo clues, and what students think each word means will vary. Evaluate each response for accuracy.

Assess Language Arts, page 7

Comparisons include: elephant/multi-purpose tool; crocodile/pincher; Sloane's viperfish/spear; green bush viper/syringe; great white shark/scalpel; beaver/chisel; naked mole rat/shovel; narwhal/sensor; and sulawesi babirusa/ornament. Explanations should reflect that each animal's teeth and the object it is compared to have a similar function.

Assess Content, page 8

Answers will vary depending on which animals students select. Students may compare the structure of function of various teeth. They should note that all teeth help animals survive in their environments.

Comprehension Check, page 9

1. A; 2. B; 3. C; 4. A; 5: Answers will vary depending on which animal students select.

The Long Walk

Assess Vocabulary, page 14

All unfamiliar words must appear in the article. Predicted definitions and sentences will vary. Students may use a printed or online dictionary to find each word's actual definition.

Assess Language Arts, page 15

Students should record the article title and each subhead. Information regarding main ideas and the summary should relate to the content of the text.

Assess Content page, 16

Answers will vary depending on which places students select. Students may describe everyday activities identified in the article or activities they can infer based on information in the text. Explanations should reflect their findings for each area.

Comprehension Check, page 17

1. A; 2. C; 3. B; 4: B; 5: Marquis takes long walks to better connect with nature and absorb the beauty around her.

Eat Ugly?

Assess Vocabulary, page 22

Students should record the words and definitions from the Wordwise feature on page 22.

developed nation: a nation with a highly developed economy and infrastructure; people living there have a higher life expectancy, higher levels of education and income

developing nation: a nation with a less developed economy; people living there have a lower life expectancy, lower levels of education and income

Diagrams should show an accurate comparison of the two terms.

Assess Language Arts, page 23

Students should record one explicit statement from each section, quoting directly from the text. Inferences may vary but should be logical and directly relate to the information in the article.

Assess Content, page 24

Students should utilize information from the article. Advertisements should clearly depict the problem of food waste and identify actions individuals can take toward finding a solution.

Comprehension Check, page 25

1. B; 2. C; 3. A; 4: B; 5: Answers will vary but should come from the article. A likely source for answers is the "Reducing Waste" sidebar on page 23.