

TEACHER'S GUIDE



Trailblazer (Grade 3)

Vol. 16 No. 4

In This Guide

This guide contains language arts and science lessons for articles in this issue of EXPLORER TRAILBLAZER.

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 TRAILBLAZER will be within the 350-750L range.

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

Objectives

- Students will identify and explain connections between vocabulary words.
- Students will ask and answer questions before, during, and after reading the article.
- Students will use what they learned to write an informational essay about manatees.

Resources

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

Summary

- The article “Man and Manatee” introduces students to Florida manatees and examines their coexistence with people.

BUILD VOCABULARY AND CONCEPTS

- **activist**
- **advocate**
- **endangered**

Display the Wordwise section on page 6 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. Then have them think about how the vocabulary words are related. Tell them to record three connections they see. For example: Both activists and advocates work to save endangered species.

After reading the article, divide the class into small groups. Have students share the connections they predicted before reading the article. Instruct them to reevaluate each connection based upon what they have learned. If necessary, have students rewrite their ideas to more accurately reflect connections between different vocabulary words.

READ

Let students know in this article they will read about Florida manatees and how humans interact with them. They will learn reasons why some people want to interact with manatees and why others think they shouldn't.

Explain to students that good readers ask questions before, during, and after they read. They ask questions, in particular, when they encounter something they don't understand or something they want to learn more about. Usually, they can find the answer in the text.

Display the photo on pages 2-3 of the projectable magazine. Instruct students to examine the man and the manatee in the photo. **Say:** *When I look at this photo, I see a man snorkeling next to a large animal. I've never seen an animal like this. What kind of animal is it? What is it like? Where does it live?* Read aloud the headline and deck. **Say:** *This information answered my questions. The animal is a manatee. It's a wild animal and it lives in Florida. Point out how close the man in the photo is to the manatee. **Say:** *If a manatee is a wild animal, I have a few more questions. How did the man get so close to the manatee? Is it safe to be this close? To find answers to those questions, I'll have to read the article.**

Give each student a copy of the **Language Arts Assessment Master**. Explain to student how they can use the worksheet to record questions and answers they have before, during, and after they read the article.

As a class, brainstorm a list of questions about the article. Instruct students to record the questions in the appropriate section of their worksheets. Then have students read the article on their own. As they do, instruct them to record additional questions and any answers they find in the text. If students still have questions about manatees after reading the article, instruct them to record those questions, too.

Man and Manatee

LANGUAGE ARTS

TURN AND TALK

Have students turn and talk to discuss what they learned about manatees. **Ask:** *What does a manatee look like?* (a chubby dolphin or a small whale) *How many manatees live in Florida?* (6,000) Invite students to share what else they learned about manatees.

- **Finding Connections** Explain to students that reading definitions tells people what words mean. But readers can get a more thorough understanding if they recognize how words are connected. Point out that this is exactly what they did when they wrote sentences about the vocabulary words in the article. Instruct students to turn and share the sentences they wrote on their **Vocabulary Assessment Masters** in small groups. Tell them to discuss similarities and differences in their sentences to get an even deeper understanding of the vocabulary words.

Ask and Answer Questions Remind students that asking and answering questions is a strategy to help them understand what they read. **Say:** *Even the best readers come across words or ideas they don't understand. Asking questions is the first step toward figuring those things out. If you ask questions, you know which answers to search for as you read and re-read the text.* Have students share and compare their **Language Arts Assessment Masters** in small groups. Do they have the same questions? Did they find the same answers? If not, encourage them to identify where in the text they found the answer and make any corrections necessary.

- **Writing About Manatees** Point out to the class that asking and answering questions doesn't just help them understand what they're reading. It's also a great way to learn about a new topic. Instruct students to use the information on their **Language Arts Assessments** to write a brief essay about manatees. Remind students to introduce the topic clearly and to include facts, definitions, and details they recorded while reading the article.

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 environment like where manatees live?*
- *Why do some people want to protect manatees?*
- *What surprised you about what you read?*

Man and Manatee

SCIENCE

Objectives

- Students will recognize unique characteristics of the Florida manatee.
- Students will understand why manatees live along the Florida coast in winter.
- Students will examine the pros and cons of human interaction with manatees.
- Students will identify actions people can take to help protect manatees.

Resources

- Content Assessment Master (page 8)
- "Meet the Manatee" poster (Teacher's Edition and pages 8-9 of the student magazine)
- Comprehension Check (page 9)
- "Man and Manatee" Interactive Whiteboard (optional)

Science Background

Manatees are endangered mammals that live in shallow, coastal waters. Unlike many water mammals, they never leave the water. When a manatee is born, its mother helps it reach the surface. That's where the baby takes its first breath. An hour later, it can swim on its own.

Manatees are herbivores that can grow up to 4 meters long and weigh up to 1,200 kilograms. Despite this size, manatees are actually graceful swimmers. Most of the time, they slowly glide along. But if needed, they can swim 15 mph (24 kph) for a short distance.

Resting manatees can stay underwater for up to 15 minutes. But when manatees swim, they must surface every three to four minutes to breathe. This can put them in danger. Many manatees die each year when they are hit by boats. Others get caught in fishing nets.

There are three species of manatees. They live in North America, in the Amazon River, and along the west coast and rivers of Africa. Regardless of where manatees live, they must go somewhere warm in winter. Manatees don't have enough blubber to keep them warm in cold waters.

ENGAGE

Tap Prior Knowledge

As a class, discuss how changing temperatures in summer and winter affect their lives. Then point out that animals must deal with changing seasons, too. Encourage students to identify different animals they've seen. Challenge them to describe what the animals do to survive when seasons change.

EXPLORE

Preview the Lesson

Display pages 2-3 of the projectable magazine. Point out how close the man in the photo is to the manatee. **Say:** *Looking at this photo, I know that this man wants to take a picture of the manatee. But seeing how close he is to the manatee, it would be pretty easy for him to reach out and touch the manatee as well. For the man, that might be an exciting experience.*

Ask: *But how do you think it would affect the manatee?* Invite students to share their opinions. Tell them they will learn more about how humans and manatees interact as they read the article.

Set a Purpose and Read

Have students read the article in order to recognize unique characteristics of the Florida manatee, understand why manatees live along the Florida coast in winter, examine the pros and cons of human interaction with manatees, and identify actions people can take to help protect manatees.

EXPLAIN

Recognizing Manatee Traits

Display the "**Meet the Manatee**" poster. Invite a volunteer to read aloud the headline and deck. Challenge students to identify six things they learned about manatees just from reading the deck. (They have (1) egg-shaped heads, (2) flat flippers, and (3) fan-shaped tails. (4) They are often spotted in shallow coastal areas. (5) They graze when they eat. (6) They eat sea grasses and algae.) Review the rest of the poster. Then divide the class into small groups. Instruct groups to review the article to find and record additional manatee traits.

SCIENCE

EXPLAIN

(continued)

Understanding Manatee Migration

Display page 4 of the projectable magazine. Zoom in on the partial map of the United States. **Say:** *This map shows where manatees live along the Atlantic and Gulf coasts. They live in areas with both dark and light blue borders during warm-weather months. But when it gets cold, they only live in the dark blue areas.* Display the map of Florida. Point out that both coastal and inland waterways have been marked with dark blue. Have students draw a map showing where manatees live at different times of the year. Remind them to include a map key. Then have them review the article with a partner. Challenge them to explain why manatees only live in Florida habitats during colder times of the year.

Examining Human Interaction with Manatees

Point out to the class that people interact with manatees all the time. **Say:** *Some people think this is OK. Others don't. Each side feels very strongly about its opinion.* Give each student a copy of the **Content Assessment Master**. Divide the class into small groups. Have groups examine the photos and review the text to identify different ways people interact with manatees. Then have them list what they consider to be pros and cons on the issue. Based on what they learned, have each student choose a side and write a brief statement explaining their opinion.

Identifying Ways People Can Help Manatees

Display page 6 of the projectable magazine. Zoom in on the sign at the bottom of the page. **Ask:** *Where would this sign be located and why is it needed?* (It would be in boat lanes of shallow waterways. That's where manatees live. When they come to the surface, they may be hurt by boats.) Divide the class into small groups. Instruct groups to review the article to identify things that activists and advocates are doing to help save manatees. Then have them brainstorm ideas and draw their own signs that will, in some way, help save this endangered species.

ELABORATE

Find Out More

Remind students that the article identified groups that want to limit access to manatees and those who don't. It also gave examples of how activists and advocates are trying to protect manatees while still giving tourists access to the animals. Divide the class into small groups. Have groups conduct research to learn more about these measures. Just how effective have these measures been at protecting this endangered species?

Extend Your Thinking About Manatees

Point out to the class that global temperatures are rising. Instruct students to imagine that temperatures rose enough that manatees were no longer limited to Florida habitats during cold-weather months. Discuss what that would mean for the manatees and for Florida businessmen who depend upon them for their income.

EVALUATE

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

- *What is the difference between an activist and an advocate?* (An activist campaigns for some kind of social change. An advocate publicly supports or recommends a particular cause or policy.)
- *Why is Kings Bay, Florida, a near-perfect winter home for manatees?* (There are dozens of warm springs scattered around the bay.)
- *What do advocates think will help protect manatees from boats?* (slower speed zones)

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.

VOCABULARY ASSESSMENT: Man and Manatee

Record each vocabulary word and its definition.

Word	Definition

Write three sentences to tell how different words are connected.

1. _____

2. _____

3. _____

Name _____

Date _____

LANGUAGE ARTS ASSESSMENT: Man and Manatee

Record questions you have about manatees before, during, and after reading the article.
Search for answers in the text.

	Questions	Answers
Before		
During		
After		

Name _____

Date _____

CONTENT ASSESSMENT: Man and Manatee

Do you think people should interact with manatees? Identify pros and cons on the issue.

Pros

Cons

--	--

I am (circle one) for / against people interacting with manatees.

Explain your opinion.

COMPREHENSION CHECK: Man and Manatee

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

- 1. When do manatees live along the Florida coastline?
 - Ⓐ only during cold-weather months
 - Ⓑ only during warm-weather months
 - Ⓒ all year long

- 2. Why is it so easy for people to see manatees?
 - Ⓐ They live in deep water.
 - Ⓑ They live in shallow water.
 - Ⓒ They live on the beach.

- 3. Why don't activists think people should touch manatees?
 - Ⓐ Manatees have thin skin.
 - Ⓑ Manatees might bite.
 - Ⓒ Manatees are wild animals.

- 4. Which of these statements is true?
 - Ⓐ Manatees are an endangered species.
 - Ⓑ Manatees are poor swimmers.
 - Ⓒ Manatees like to be touched.

5. Explain why Florida is the best place for manatees to go during winter.

Objectives

- Students will use context clues to understand the meaning of unfamiliar words.
- Students will identify cause-and-effect relationships in a text.

Resources

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

Summary

- The article “Down to Earth!” introduces students to the force of gravity and explains how it works.

BUILD VOCABULARY AND CONCEPTS

- **force**
- **gravity**
- **mass**
- **weight**

Display the vocabulary words on a word wall or on the whiteboard. Inform students that when they read they will encounter words they don't know or words that they are more familiar with in another context. Remind them that using context clues such as the sentences before and after an unknown word and visuals such as photographs or illustrations on the page can help them understand 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. With a partner, have them scan the article to locate each bold word in the text.

Tell students to record text and visual clues from the article that are related to each vocabulary word. Then instruct partners to record their own idea about what each word means. Invite volunteers to read aloud the definitions in the **Wordwise** feature on page 14 of the article. Encourage partners 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 the force of gravity and explain how it works.

Explain to students that when people write about complicated topics, they often include examples of cause-and-effect to help readers understand the text. Good readers always search for these connections when they read.

Display pages 10-11 of the projectable magazine. Read aloud the headline and deck. Encourage students to describe what is happening in the illustration. Then model how to identify a cause-and-effect relationship. **Say:** *Sometimes when you read, the writer tells you what happened and why. The “what” is the effect, or result. The “why” is the cause, or the reason. In this illustration, I see a very frightened worm inside an apple. Why does the worm look frightened? Because it's falling. Why is it falling? Gravity is pulling it toward Earth. These are both easy examples of a cause-and-effect relationship.*

Point out to the class that, as in these examples, there can be just one cause and one effect in a cause-and-effect relationship. But often it's more complicated than that. Several things may cause one thing to happen. Likewise, one cause can have many different effects.

Give each student a copy of the **Language Arts Assessment Master**. Have students read the article on their own. As they read, instruct students to record one example of a cause-and-effect relationship in each section of the article. Challenge them to find examples that have more than one cause or effect.

Down to Earth

LANGUAGE ARTS

TURN AND TALK

Have students turn and talk to discuss what they learned about gravity. **Ask:** *What is a force?* (a push or pull that can make something move) *Who is Isaac Newton?* (an English scientist in the 1600s who understood gravity and wrote laws for how objects moved) *Why do things fall to the ground when you drop them?* (The gravity of Earth is pulling them down.)

- **Strengthen Understanding** Inform students that combining what you already know with what you learn can help readers understand new words. **Say:** *Once you understand what a word means, it's easier to use it correctly in a sentence.* Challenge students to make accurate statements using each of the vocabulary words. Encourage them to use their **Vocabulary Assessment Master** as a resource. Remind students to be original. They shouldn't restate sentences from the article. They should create new sentences of their own.

- **Identify Cause-and-Effect Relationships** After reading the article, remind students that making connections can help them understand what they've just read. One type of connection is the relationship between a cause and an effect. Invite students to turn and talk to share their **Language Arts Assessment Masters** in small groups. Instruct students to compare their results. Did they each identify the same cause-and-effect relationships? If not, do all of their examples make sense? Encourage students to review the article to see where any missed connections went astray. Rejoin as a class. Invite students to share examples of one-on-one relationships as well as connections with more than one cause or effect.

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 gravity seem like a strong force? What makes it seem weak?*
- *How do you know gravity has a long reach?*
- *What surprised you about what you read?*

Down to Earth

SCIENCE

Objectives

- Students will understand what gravity is.
- Students will recognize how gravity affects things on Earth's surface.
- Students will understand the difference between mass and weight.

Resources

- Content Assessment Master (page 16)
- "May the Force (of Gravity) Be With You!" poster (Teacher's Edition)
- Comprehension Check (page 17)

Science Background

If you drop a book, it falls. If you jump, you come back down. If an airplane takes off, it will land. None of these things floats out into outer space. Why? Gravity. Gravity is a force that pulls one object toward another. It pulls books, people, and planes toward the center of Earth.

The force of gravity is determined by mass and distance. Mass is the amount of material in an object. Objects with more mass have a stronger gravitational pull. Objects that are closer together also have a stronger gravitational attraction to each other.

Gravity is such a constant to life on Earth that people likely don't even think about how it affects their lives everyday. But gravity affects everything you see and do.

When you look up in the sky at night, you see the moon. The moon is there because of gravity. Gravity caused pieces of matter to clump together to form the moon. The pull of Earth's gravity keeps the moon going around Earth. And the pull of the sun's gravity keeps Earth and the other planets going around it.

Gravity acts on all objects, whether they're as big as a moon or as small as a pea. It always attracts and never repels. It's a weak force, but it works over long distances. Because of that, gravity is the most important force in space.

ENGAGE

Tap Prior Knowledge

Ask students if they've ever dropped a book. What happened? Ask them if they've ever seen an apple fall from a tree. What happened? Ask them if they've ever seen someone jump down from a high place. What happened? Now ask the class what all three of these things have in common. Guide them to recognize that the book, the apple, and the person all moved downward. Challenge the class to explain why the objects didn't move up instead.

EXPLORE

Preview the Lesson

Display pages 10-11 of the projectable magazine. Have students examine the worm in the apple.

Ask: *Why does this worm look scared?* (He's in an apple that's falling from a tree.) *What clues in the illustration tell you the apple is falling?* (The lines from the leaves to the apple.) *And what do you already know that tells you the apple is falling down instead of up?* (Nothing ever falls up.) Inform students that this happens because of gravity. Tell them they'll learn why as they read the article.

Set a Purpose and Read

Have students read the article to understand what gravity is, how it affects things on Earth's surface, and the difference between mass and weight.

EXPLAIN

Understanding the Force of Gravity

Display page 12 of the projectable magazine. Zoom in on the introduction and invite a volunteer to read that text aloud. Guide students as they discuss what gravity is and how they know it exists. Give each student a copy of the **Content Assessment Master**. As a class, review the article. As you do, work together to summarize the content in each section. Have students record each summary. Then have them draw a picture that illustrates the main point each section makes about gravity.

SCIENCE

EXPLAIN

(continued)

Recognizing the Affects of Gravity

Display the "**May the Force (of Gravity) Be With You!**" poster. Read aloud the headline and deck.

Say: *Gravity is a natural force. Fortunately for us, it's everywhere on Earth. You can't escape it. But this headline raises an important question. What if you had a choice? What if you could turn gravity off? How would our lives be different? Zoom in on the section "Feeling the Force."* Invite a volunteer to read the copy aloud. Invite volunteers to explain how gravity affects things on Earth's surface. Review the other sections of the poster in this same way.

Understanding Mass and Weight

Display page 15 of the projectable magazine. Instruct students to examine the three illustrations. **Ask:** *What do you notice?* (The same person is shown on Earth, the moon, and Mars. The person's weight changes.) Review the infographic's text with the class. Then challenge volunteers to explain in their own words why the person's weight changed. (The force of gravity changed.) **Ask:** *What would the numbers in the illustrations be like if they showed the person's mass instead of weight? (the same) Why?* (The person's mass would stay the same. Gravity has no effect on mass.) Invite students to share what else they know about mass and weight.

ELABORATE

Find Out More

Remind students that the moon's gravity pulls on Earth. According to the article, this is what causes ocean tides on Earth. As a class, conduct research to learn how the moon's gravity does this. Challenge students to find additional ways the moon's gravity affects Earth. Then instruct groups to find ways Earth's gravity impacts the moon.

Extend Your Thinking About Gravity

Inform students that scientists have explored the possibility of having people live on the moon and Mars. Remind the class that the force of gravity on the moon and Mars is less than what it is on Earth. Brainstorm ideas about how this change in gravity could affect what people do if they lived on the moon or Mars. What would be easier to do? What would be harder?

EVALUATE

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

- *What is gravity?* (a force that pulls one object toward another object)
- *How does gravity affect things on Earth?* (It causes them to fall or move toward Earth's center.)
- *How do you know gravity can work over long distances?* (The sun's gravity forces Earth and the other planets to go around it.)

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

Name _____

Date _____

VOCABULARY ASSESSMENT: Down to Earth

Record information from the article about each vocabulary word.

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

LANGUAGE ARTS ASSESSMENT: Down to Earth

Record a cause-and-effect relationship for each section of the article.

	Cause	Effect
Introduction		
Weak or Strong?		
Putting Gravity to the Test		
A Weighty Issue		
Gravity's Long Reach		
An Important Force		

Name _____

Date _____

CONTENT ASSESSMENT: Down to Earth

Write a summary for each section of the article. Draw a picture that shows what each section tells you about gravity.

	Weak or Strong?	Putting Gravity to the Test	A Weighty Issue	Gravity's Long Reach	An important Force
Summarize					
Draw					

COMPREHENSION CHECK: Down to Earth

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

1. What is gravity?
 Ⓐ a force
 Ⓑ a rule
 Ⓒ magic

2. What does gravity do?
 Ⓐ push objects apart
 Ⓑ pull objects together
 Ⓒ make things stick

3. Which of these objects has the most gravity?
 Ⓐ one with more weight
 Ⓑ one with more mass
 Ⓒ one that floats

4. Which planet does the sun's gravity pull on most?
 Ⓐ Earth
 Ⓑ Pluto
 Ⓒ Mercury

5. Describe how gravity affects one thing you do every day.

Objectives

- Students will identify and investigate the definitions of unfamiliar words.
- Students will identify the main idea of the article and explain how it is supported by key details.
- Students will summarize the article.

Resources

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

Summary

- The article "Frozen!" takes readers on 14-year-old Jade Hameister's journey to the North Pole. The trek is the first leg in her quest to be the youngest explorer to complete the Polar Hat Trick, or hikes across the North Pole, South Pole, and Greenland.

BUILD VOCABULARY AND CONCEPTS

Display pages 22-23 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 that what they just attempted to identify was the main idea of the article. Tell students that the main idea is the main topic. Everything in the article is connected to the main idea. Point out that paragraphs have a main idea, too. Everything in a paragraph is connected to its main idea.

Display pages 16-17 of the projectable magazine. Model how to identify the main idea of the article. **Say:** *When I look at these pages, I notice two things right away: the photo and the headline. The photo tells me the article is about someone skiing in a very cold place. The headline tells me it's actually frozen here. These are good clues, but I need to know more. Who is this person? Where is the person going? Why is the person or the trip important enough to be featured in an article? Point out the deck in the lower right corner of the screen. Read it aloud. **Then say:** *Sometimes you have to search for the best clues. After reading this, I know exactly what this article is about. As I read, I will learn a 14-year-old girl who took trekked across ice to reach the North Pole.**

Have students read the article in small groups. As students read, encourage them to search for details that support the main idea of the article.

LANGUAGE ARTS

TURN AND TALK

Have students turn and talk to discuss what they learned about Jade Hameister and her trip to the North Pole. **Ask:** *Why did Jade Hameister want to go to the North Pole?* (She listened to her dad's stories and wanted to go after she heard about the Polar Hat Trick.) *What is the Polar Hat Trick?* (hikes across the North Pole, the South Pole, and Greenland) *How many people have complete the Polar Hat Trick?* (very few) Encourage students to share other facts they learned about Jade Hameister and her trip to the North Pole.

- **Identify Main Ideas** Remind students that the article has a main idea. But paragraphs have main ideas, too. Explain that they can find the main idea of a paragraph the same way they found the main idea of the article. They must search for important clues. Give each student a copy of the **Language Arts Assessment Master**. Instruct students to write the main idea of the article in the middle circle. Then have them select four more paragraphs in the article. Challenge them to write the main idea of each. Encourage students to turn and talk to analyze and compare results. Challenge them to recognize how the main idea of each paragraph ultimately supports the main idea of the text.

- **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 Hameister prepared for her trip. Prompt discussion with questions such as: *Who helped her prepare for the trip?* (her father) *Where did she train?* (outside, at the gym, at a special training club, and on the beach) *What did she do on the beach?* (She dragged heavy tires on through the sand.)

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 did Jade and her team wait until spring to explore the North Pole?*
- *Why is it hard to find the North Pole?*
- *What surprised you about what you read?*

Frozen!

SCIENCE

Objectives

- Students will understand what the environment is like at the North Pole.
- Students will explain how Jade Hameister and her team prepared for and adapted to conditions at the North Pole.

Resources

- Content Assessment Master (page 24)
- Comprehension Check (page 25)

Science Background

The North Pole, located at exactly 90 degrees north latitude, is the northernmost point on Earth. It lies in the middle of the Arctic Ocean. The water here is more than 4,000 meters deep. It is almost always covered in floating ice.

Because of its location, sunlight here comes in extremes. In summer, daylight lasts up to 24 hours. In winter, an equal amount of time is spent in darkness. Each year, there's only one sunrise on the March equinox and one sunset at the September equinox.

Few people have explored the North Pole. It's difficult to do. There's no land to build a facility and it's hard to set up equipment.

In 1827, British Admiral William Edward Parry led the first expedition specifically targeting the North Pole. Nobody actually succeeded until the 20th century. And the first verified expedition by foot wasn't accomplished until the late 1960s.

In April 2016, 14-year-old Australian Jade Hameister became the youngest person to ski to the North Pole. Her four-person team succeeded after going more than 150 kilometers in temperatures down to -25° Celsius.

For Hameister, the North Pole is just the beginning. In 2017, she plans to cross Greenland. Then, she'll tackle the South Pole. If she succeeds, she'll become the youngest person ever to complete all three treks.

ENGAGE

Tap Prior Knowledge

Display a globe. Spin it. Stop the globe by placing your finger on it. Invite a volunteer to identify the location you selected. Invite students to share what they know about this place. Then tell them to imagine that they're going on an adventure there. As a class, brainstorm ideas about what someone could do in this place. Challenge students to explain how they would prepare for the trip.

EXPLORE

Preview the Lesson

Display pages 16-17 of the projectable magazine. Invite a volunteer to read aloud the headline and deck. As a class, brainstorm a list of challenges people might face as they try to ski across the ice to reach the North Pole.

Set a Purpose and Read

Have students read the article in order to understand what the environment is like at the North Pole to explain how Jade Hameister and her team prepared for and adapted to conditions at the North Pole.

EXPLAIN

Understanding the North Pole

Have students scan the article's photos in their student magazines. As they do, instruct them to write adjectives that describe what it is like at the North Pole. Invite volunteers to share their adjectives with the class. Then display page 19 of the projectable magazine. To give students' proper perspective, invite a volunteer to identify the location shown in the map on a globe. Explain how the North Pole's location causes it to be so icy and cold. (The North Pole doesn't get any direct sunlight. Even in summer, the sun is low on the horizon. In winter, it's below the horizon.) Read aloud and discuss the information below the map. As a class, scan the article for more details about what the environment is like at the North Pole.

EXPLAIN

(continued)

Explaining Preparation and Adaptation

Display page 22 of the projectable magazine. Review the information in the infographic. **Say:** *Climbing Mount Everest, going to the moon, and reaching the South Pole are all lofty goals. Few people have had the opportunity to do these things. But even fewer have attempted to tackle the Polar Hat Trick.* **Ask:** *Why do you think that is?* Invite volunteers to share their ideas. If necessary, remind students that the Polar Hat Trick is three trips: the North Pole, the South Pole, and Greenland. **Say:** *So far, Jade Hameister has tackled one of these journeys. She reached the North Pole. But getting there wasn't easy. It took a lot of planning and preparation. And once she got there, she had to adapt the conditions to survive.* Give each student a copy of the **Content Assessment Master**. Instruct students to identify two problems Jade Hameister and her team faced when exploring the North Pole. Have them describe how she prepared for each problem and how she and her team had to adapt once they got there.

ELABORATE

Find Out More

Remind students that Jade Hameister's trek to the North Pole is the just the first leg of the Polar Hat Trick. To reach her goal, she still has to cross Greenland and reach the South Pole. Have students conduct research to learn more about those locations. Tell them to make a list of major obstacles the team could face in each place. Challenge them to find solutions other people have used to solve these problems and safely return from each journey.

Extend Your Thinking About Climate Change

Remind students that Jade Hameister and her team had just a short window in spring to complete their trip to the North Pole. Discuss why. Then remind students that climate change is causing more ice at the North Pole to melt than in the past. As a class, discuss how this change could impact future attempts to reach the North Pole.

EVALUATE

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

- *Where is the North Pole?* (in the Arctic Ocean)
- *What is it like at the North Pole in winter?* (It's pitch dark and gets as cold as minus 50° Celsius.)
- *What is it like there in the summer?* (It's always sunny. The ice gets thinner and melts.)

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

VOCABULARY ASSESSMENT: Frozen!

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

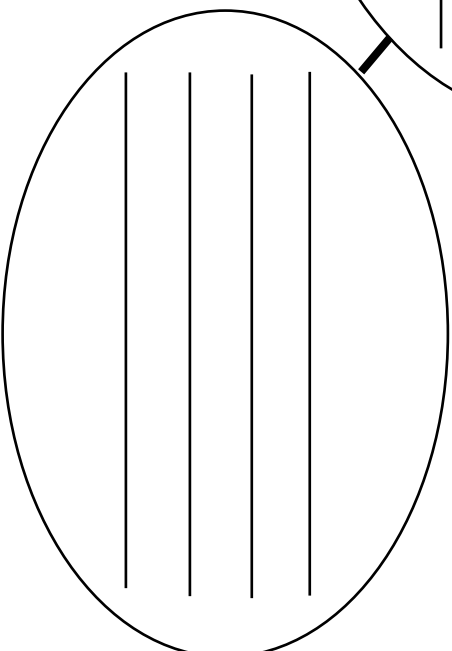
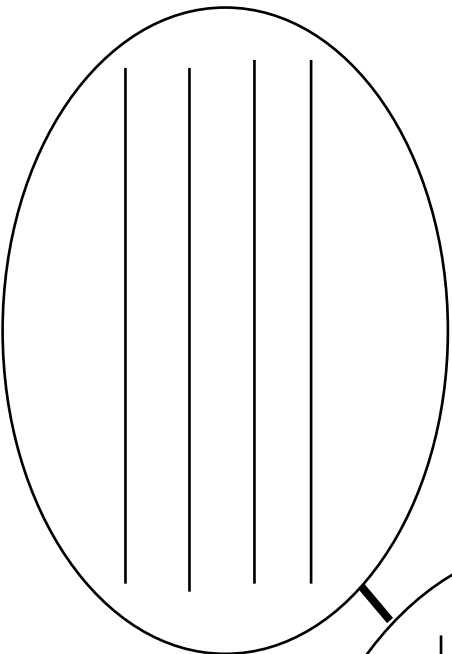
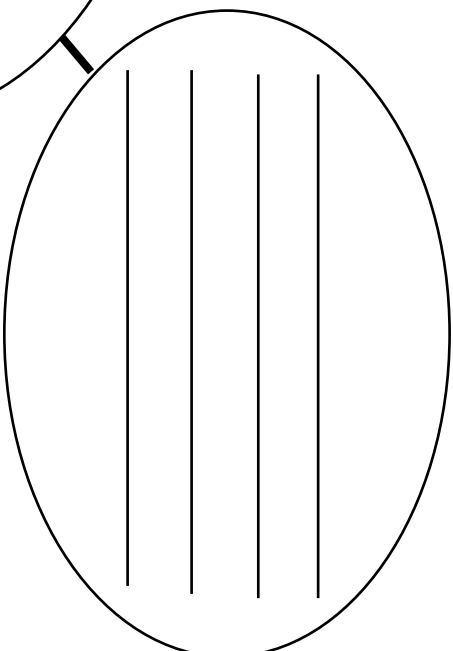
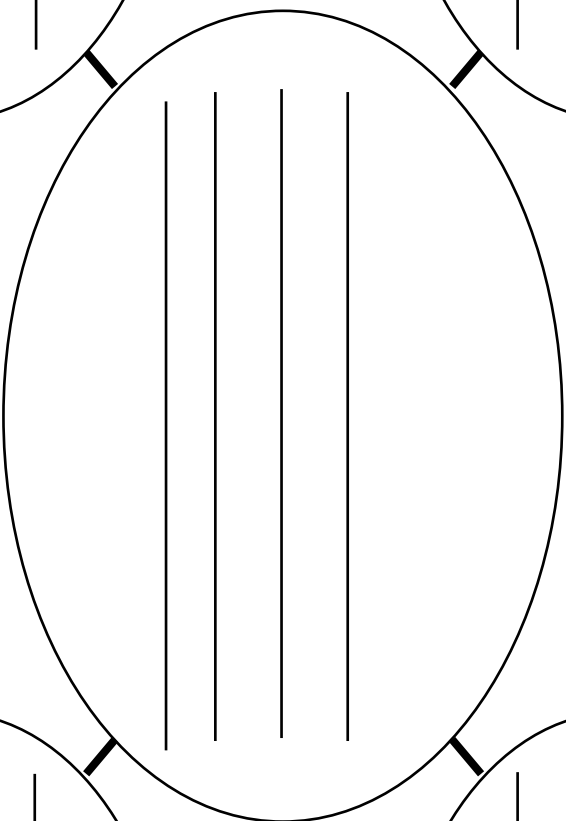
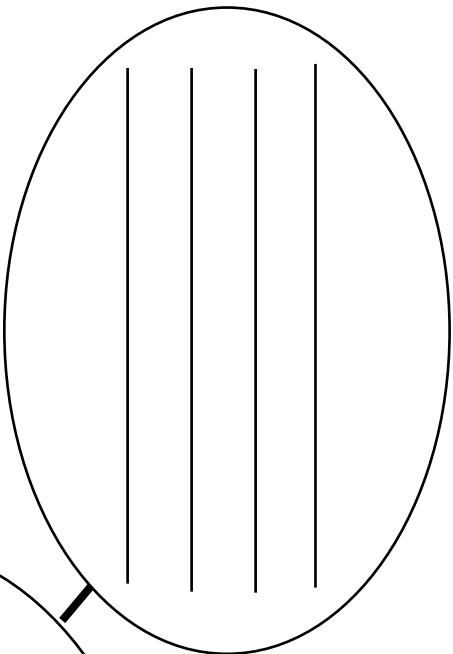
Unfamiliar Words			
Word			
Predicted Definition			
Sentence			
Dictionary Definition			
Sentence			

Name _____

Date _____

LANGUAGE ARTS ASSESSMENT: Frozen!

Write the main idea of the article in the middle circle. Pick four paragraphs. Write the main idea of each.



Name _____

Date _____

CONTENT ASSESSMENT: Frozen!

Identify two problems Jade Hammeister faced on her trip to the North Pole. Tell how she prepared for each problem. Tell how she and her team had to adapt once they got there.

	Problem 1: _____	Problem 2: _____
Prepare		
Adapt		

COMPREHENSION CHECK: Frozen!

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

1. What are the three parts of the Polar Hat Trick?
Ⓐ the North Pole, the South Pole, and Greenland
Ⓑ the North Pole, the South Pole, and Iceland
Ⓒ the North Pole, Greenland, and Iceland

2. Why don't people explore the North Pole in summer?
Ⓐ The ice is floating
Ⓑ The ice melts.
Ⓒ The ice is too thick.

3. How long is spring at the North Pole?
Ⓐ a few days
Ⓑ a few weeks
Ⓒ a few months

4. What did Jade consider to be the biggest challenge on her trip?
Ⓐ the snow
Ⓑ the ice
Ⓒ the cold

5. Why isn't there a marker or sign to show where the North Pole is located?

ANSWER KEY

Man and Manatee

Assess Vocabulary, page 6

Students' predictions and the sentences they write will vary. They should record the words and definitions from the Wordwise feature on page 6.

activist: a person who campaigns for some kind of social change

advocate: a person who publicly supports or recommends a particular cause or policy

endangered: at risk of extinction

Sentences will vary depending on the connections students identify.

Assess Language Arts, page 7

Students' questions will vary, but all questions should relate to the article. All answers should come directly from the text.

Assess Content, page 8

The pros and cons students identify may vary but should relate to the content of the article. Students should circle their opinions and write a statement that clearly explains whether or not they think people should be allowed to interact with manatees.

Comprehension Check, page 9

1. C; 2. B; 3. C; 4. A; 5: Possible response: Manatees can't survive in cold water. The water around Florida is warm in winter.

Down to Earth

Assess Vocabulary, page 14

Students should record the words and definitions from the Wordwise feature on page 14.

force: a push or pull that can make something move

gravity: a force that pulls one object toward another object

mass: the amount of material in an object

weight: how heavy something is

Text clues, visual clues, and what students think each word means may vary. Evaluate answers for accuracy.

Assess Language Arts, page 15

Answers will vary, but each cause and effect should come from the article and each identified relationship should make sense.

Assess Content, page 16

Summaries should accurately reflect the content in each section. Drawings may or may not mimic the illustrations in the article, but they should give an accurate depiction of the content in each section.

Comprehension Check, page 17

1. A; 2. B; 3. B; 4. C; 5: Answers will vary.

Frozen!

Assess Vocabulary, page 22

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 23

Students should record the main idea of the article. (A 14-year-old girl went to the North Pole.) Additional responses will vary, depending on which paragraphs students chose to investigate.

Assess Content, page 24

Answers will vary depending on which problems students identify. However, students should identify specific examples from the article and explain how the team planned for the problems and adapted to overcome them once they arrived at the North Pole.

Comprehension Check, page 25

1. A; 2. B; 3. B; 4. C; 5: Polar ice is always drifting. You can't put up a marker because the North Pole's location is always changing.