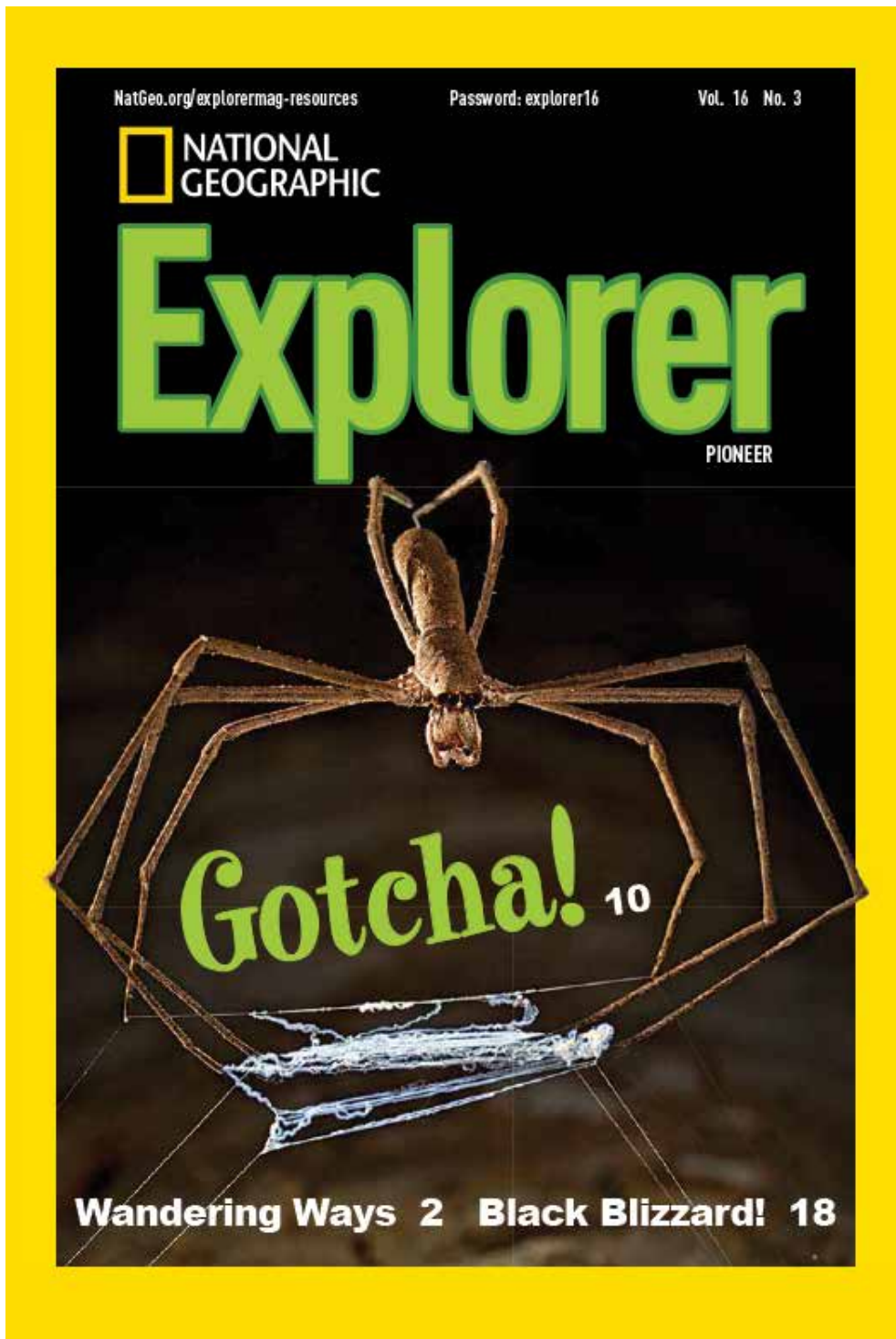


# TEACHER'S GUIDE



Pioneer

Vol. 16 No. 3

## In This Guide

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

## 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 PIONEER will be within the 250-550L 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](http://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 predict definitions and then write sentences to better understand unfamiliar words.
- Students will use information from the text, photos, and maps to understand the lives of three nomadic groups.

### Resources

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

### Summary

- The article “Wandering Ways” introduces students to three nomadic tribes across the world and explores how they live.

## BUILD VOCABULARY AND CONCEPTS

- **nomad**
- **trade**

Give each student a copy of the **Vocabulary Assessment Master**. Point out to students that they may have heard some or all of these words before.

Using that background knowledge as a base, instruct students to predict and write a definition for each word. Then have them write a sentence using each word, based on the definitions they wrote.

Display the Wordwise feature on page 8 of the projectable magazine. Review the definitions as a class. Have students add these definitions to their worksheets. Working with a partner, challenge students to write new sentences, using each word as it is defined in the article.

Invite volunteers to read aloud the before and after sentences they wrote for each word. As a class, examine how new knowledge contributed to students' understanding of each word.

### READ

Inform students that the purpose of this article is to introduce them to different nomadic cultures found across the world. Discuss what a nomadic culture is.

Display pages 2-3 of the projectable magazine. Tell students to look at the photo. **Say:** *When people read, they usually focus on the words. But photos can tell you a lot, too. For example, when I look at this photo, I know that this person lives in a desert. He uses camels to carry his things.* **Ask:** *What else can you learn by looking at the photo?* Encourage students to share their ideas.

Then pose one more question to the class. **Ask:** *Where do you think this person lives?* Invite volunteers to answer the question. Then zoom in on the map of Africa at the bottom of the page. Point out to the class that you might have been able to answer this question by reading the text. But that wasn't necessary in this case. All you had to do was look at the map. **Say:** *Many times, readers can get information from photos, captions, diagrams, and other text elements in an article. That information can quickly answer some of the questions they have.*

Give each student a copy of the **Language Arts Assessment Master**. Have students read the article in small groups. As they do, instruct them to use text, photos, and maps to learn about three more nomadic tribes around the world.

# Wandering Ways

## LANGUAGE ARTS

### TURN AND TALK

Have students turn and talk to discuss what they learned about nomads. **Ask:** *What is a nomad?* (a member of a group of people that has no stable home and moves from place to place) *Why are the Tsaatan called the Reindeer People?* (They raise reindeer.) *Where do the Moken live when they aren't on land?* (on ships out at sea) *What animals help the Wodaabe survive in the Sahara?* (cows) Invite students to share what else they learned about the nomads introduced in the article.

- **Predicting Definitions** Have students turn and talk to discuss what they learned about the two vocabulary words. Encourage them to compare their results in small groups. Instruct students to discuss how examining the information they collected helped them better understand each term.

- **Integrate Information** After reading the article, review students' **Language Arts Assessment Masters** as a class. Invite volunteers to share the information they recorded. Discuss how using text, photos, and maps helped students learn about these nomadic groups. Challenge students to identify other sources that could help them learn even more about these people.

### 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 do the Wodaabe do during the dry season? What do they do during the rainy season?*
- *What animal is important to the Tsaatan?*
- *What surprised you about what you read?*

# Wandering Ways

## SOCIAL STUDIES

### Objectives

- Students will compare and contrast three nomadic cultures.
- Students will understand that nomads live all over the world.

### Resources

- Content Assessment Master (page 8)
- "Nomads" poster (Teacher's Edition)
- Comprehension Check (page 9)

### Social Studies Background

They live in groups, moving from place to place in search of food and a temporary home. They take all that they own with them. They are nomads and this is their way of life.

Although it has become increasingly difficult to avoid modern infrastructure, many groups of nomads still exist. Some, like the Tuareg, live in deserts. The Tuareg live in the Sahara. Long ago, they were nomadic herders of camels, goats, and sheep. Now, they are well-known traders who travel in caravans across the desert.

The Wodaabe also live in the Sahara. These herders depend on cows for survival. During the dry season, they move around in search of grass for their cows to eat. During the rainy season, when grass is plentiful, the tribe reunites.

The Tsaatan are nomads that live in northern Mongolia. Each family keeps a small herd of reindeer, which is why the Tsaatan are also known as the Reindeer People. Reindeer take care of most of the Tsaatan's needs. To ensure that their reindeer have food, the Tsaatan move to new pastures every five weeks or so.

Not all nomads live on land. For nearly 4,000 years, the Moken have sailed around the islands off the coast of Myanmar (Burma). These sea gypsies live on boats, hunting and gathering creatures from the ocean. During monsoon season, they transition to land to avoid the dangerous storms at sea.

### ENGAGE

#### Tap Prior Knowledge

Instruct students to think about the last time they went outside and just wandered around. Invite volunteers to tell what they did. Now tell students to imagine that this was their normal life. They had no permanent home. There were no grocery stores to buy food. They constantly moved from place to place and had to take everything they owned with them. Would students like to live like this? Encourage them to share their opinions.

### EXPLORE

#### Preview the Lesson

Display pages 2-3 of the projectable magazine. As a class, compare and contrast this person's life to what it's like where you live. Guide the class to understand that this person is a Tuareg, a type of nomad that lives in the Sahara in Africa. **Say:** *The Tuareg are nomads. Different groups of nomads live all over the world. Although nomads are always on the move, no two groups of nomads are exactly alike.* Tell students they will learn more about the similarities and differences among nomad groups as they read the article.

#### Set a Purpose and Read

Have students read the article in order to compare and contrast three nomadic cultures and understand that nomads live all over the world.

### EXPLAIN

#### Compare and Contrast Cultures

As a class, review the images in the article. Invite students to describe the people they see in each photo. Discuss what life would be like in each nomadic culture. Give each student a copy of the **Content Assessment Master**. Divide the class into small groups. Instruct each group to select two nomad groups from the article. Using information from the article and notes from their **Language Arts Assessment Masters**, have groups compare and contrast the two groups. Rejoin as a class to share and compare results.

# Wandering Ways

## SOCIAL STUDIES

### EXPLAIN

(continued)

#### Recognizing a World of Nomads

Display pages 2-3 of the projectable magazine.

Zoom in on the second paragraph of text and invite a volunteer to read that paragraph aloud. **Say:**

*According to the text, at one time, many people lived as nomads. But the world changed. It's difficult—but not impossible—to live this way in the modern world.*

Remind students that they read about three groups of nomads in the article. Inform them that other nomadic groups do exist. Display the **"Nomads"**

**poster.** Zoom in on the photo and information related to the Inuit. Invite a volunteer to read the text aloud. Encourage students to share what else they know about the Inuit. Then locate where the Inuit live on the world map. Discuss what it's like here. Talk about how the climate could impact the way the Inuit live. Explore the remaining groups of nomads in this same way.

### ELABORATE

#### Find Out More

Display the **"Nomads" poster.** Point out to the class that the three nomadic groups from the article are on the poster. As a class, select one of the five other nomadic cultures. Brainstorm a list of topics students could investigate about this culture. Divide the class into small groups. Assign each group one of those topics. Challenge them to write a summary telling what they learned. Invite groups to share their summaries with the class.

#### Extend Your Thinking About Nomads

Point out to students that each of the nomadic groups featured in the article depends on a certain type of animal for survival. As a class, brainstorm ideas about how having these animals has shaped each culture. Discuss what would happen to the cultures if the animals disappeared.

### EVALUATE

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

- *What do people do when they trade?* (exchange one thing for another)
- *What is it like where the Wodaabe live?* (hot and sandy with wet and rainy seasons)
- *Why are the Moken called sea gypsies?* (For much of the year, they live and trade on the sea.)

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

Name \_\_\_\_\_

Date \_\_\_\_\_

**VOCABULARY ASSESSMENT : Wandering Ways**

Use this organizer to study each vocabulary word in the article.

<b>Word</b>		
<b>Predicted Definition</b>		
<b>Sentence</b>		
<b>Definition from the Article</b>		
<b>Sentence</b>		

Name \_\_\_\_\_

Date \_\_\_\_\_

**LANGUAGE ARTS ASSESSMENT: Wandering Ways**

Record information about these nomad groups from the text, photos, and maps in the article.

Group	Text	Photos	Map
Wodaabe			
Tsaatan			
Moken			

Name \_\_\_\_\_

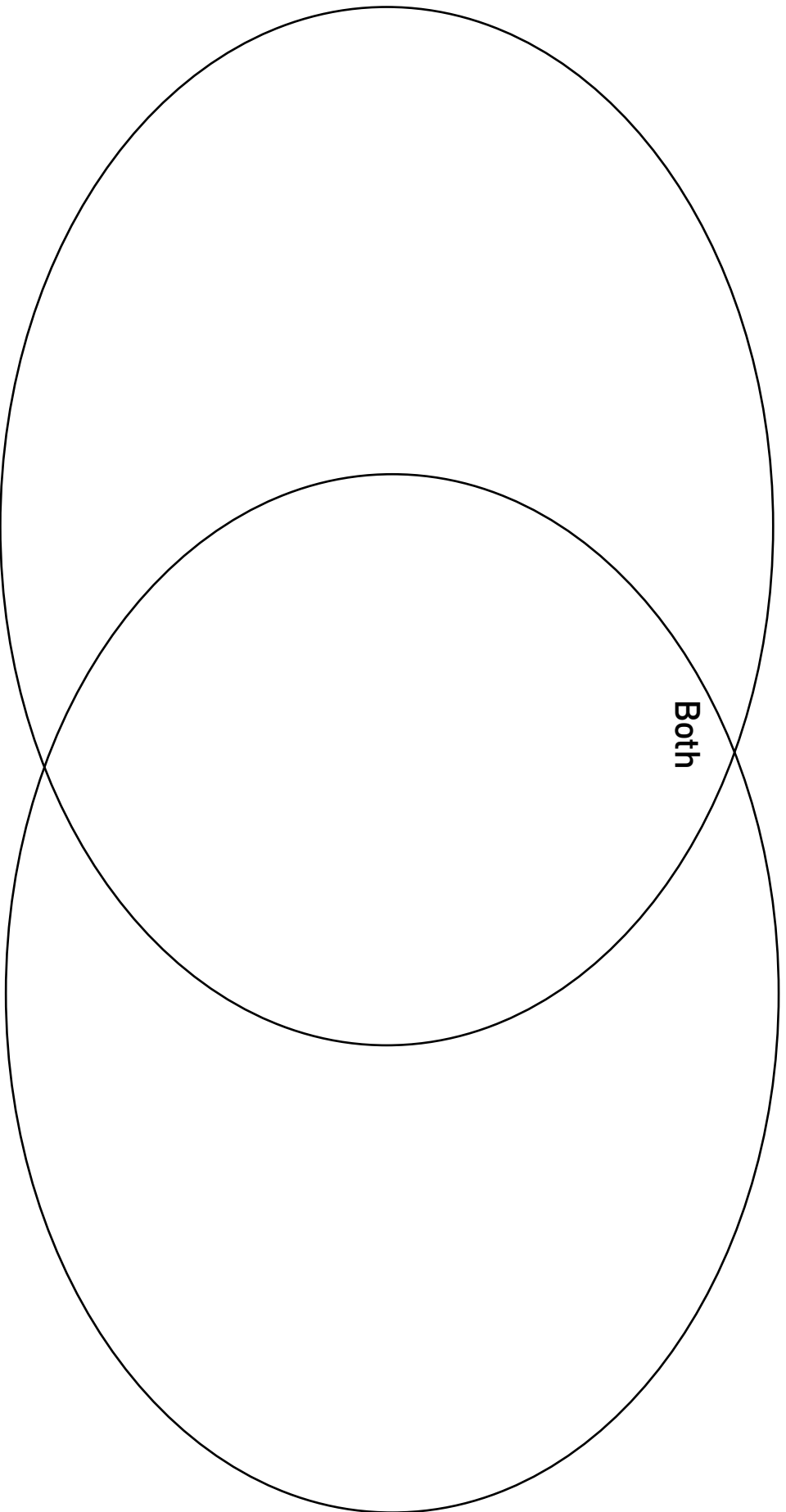
Date \_\_\_\_\_

**CONTENT ASSESSMENT : Wandering Ways**

Use this diagram to compare and contrast two nomad groups in the article.

Group: \_\_\_\_\_

Group: \_\_\_\_\_





**COMPREHENSION CHECK: Wandering Ways**

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

1. What animal do the Tuareg use when they travel?

- Ⓐ cows
- Ⓑ reindeer
- Ⓒ camels

2. Which nomadic group lives in Mongolia?

- Ⓐ Tsaatan
- Ⓑ Moken
- Ⓒ Wodaabe

3. Where do the Moken live for most of the year?

- Ⓐ in a desert
- Ⓑ on high plains
- Ⓒ on boats at sea

4. Why do the Tsaatan travel often?

- Ⓐ to trade for supplies
- Ⓑ to stay away from bad storm
- Ⓒ to find food for reindeer

5. Pick two groups from the article. Tell one way they are alike and one way they're different.

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## LANGUAGE ARTS 510L

### Objectives

- Students will explore the meaning of vocabulary words in a variety of different ways.
- Students will describe how the writer uses reasons to support specific points in the text.

### Resources

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

### Summary

- The article “Gotcha!” introduces students to predators that live around the world and outlines the unusual methods they use to catch their prey.

## BUILD VOCABULARY AND CONCEPTS

- **predator**
- **prey**

Read aloud each of the vocabulary words. As you do, poll the class to see how many students are familiar with each word. Then challenge volunteers to provide a scientific definition of each term.

Point out that this task was most likely easier with some of the words than others. **Say:** *As students, your vocabulary is constantly expanding. But many of the words you learn have multiple meanings. When reading about science, it's important to understand the scientific definition. And a great way to remember that more technical definition is to study the word in multiple ways.*

Give each student a copy of the **Vocabulary Assessment Master**. Tell students they will use this worksheet to explore the vocabulary words in four different ways: writing definitions, restating the definition in their own words, using the term in a sentence, and then drawing a picture to help them remember what the word means. Have students complete the worksheet in small groups.

## READ

Inform students that the purpose of this article is to introduce readers to predators that live around the world and explain the unusual ways they catch prey.

Display pages 10-11 of the projectable edition. Read aloud the headline and text. **Say:** *This article is about predators and prey. According to this text, some predators trick, trap, and even punch their prey. This is a key point of the article. But why do predators do this? What are the reasons? It says right here. They do this because finding food in the wild isn't easy.*

Explain to the class that when a text contains a statement like this, the writer must always support the fact with a reason. **Say:** *Reasons tell why things happen. People can write anything they want to. But if writers don't include logical reasons, the text won't make sense or be believable. Good writers always include reasons that support important points they want to make.*

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 identify an important point the writer makes about each predator. Encourage them to search for reasons that support each point.

## LANGUAGE ARTS

### TURN AND TALK

Have students turn and talk to discuss what they learned about unusual predators. **Ask:** *What is a predator? (an animal that kills and eats other animals) What strange thing does the archerfish do to capture prey? (It spits a stream of water at its prey.) How does a peacock mantis shrimp catch prey? (It punches really hard.)*

- **Exploring Meanings** Inform students that it's essential for readers to understand the technical definition of words when reading about science. If you don't know that, it's much harder to understand what you're reading. **Say:** *Once you do understand what scientific terms mean, not only can you follow along with the text but you can use the words correctly in new sentences of your own.* Challenge students to make accurate statements using each of the vocabulary words. Encourage them to use their **Vocabulary Assessment Masters** as resources. But remind them to be original. Students shouldn't restate sentences from the article. They should create new sentences of their own.

- **Identifying Reasons** After reading the article, remind students that reasons tell why something happened. Invite students to share their **Language Arts Assessment Masters** in small groups. Challenge them to examine one another's results to determine that all reasons are valid and support the identified key points in 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.

- *Why does a netcasting spider splash droppings on the ground below its net?*
- *How does glowing help glowworms catch prey?*
- *What surprised you about what you read?*

## SCIENCE

### Objectives

- Students will understand that some animals have adaptations or traits that help them find food in unique ways.
- Students will recognize that predators live in all types of environments.

### Resources

- Content Assessment Master (page 16)
- "Creative Carnivores" poster (Teacher's Edition)
- Comprehension Check (page 17)
- "Gotcha!" Interactive Whiteboard (optional)

### Science Background

All animals need food to live. Some animals get their food by eating other animals. They are predators, and the food they eat is their prey.

Predators use a variety of techniques to capture prey. Some are simply faster or stronger than the animals they pursue. Others utilize unique body parts or interesting techniques.

For example, the margay cat attracts monkeys with its voice. Its call sounds just like a baby monkey. The peacock mantis shrimp packs a strong punch. It can take down prey twice its size. Netcasting spiders spin and throw nets. And the archerfish spits a strong stream of water to knock prey off of branches into the water.

Many predators act alone. But some attack as a team. And even as a team, unique parts or traits can give predators an edge over their prey.

Glowworms, for example, have a bioluminescent shine. When hundreds of glowworms shine from the roof of a cave, they resemble a starry night. Unsuspecting insects, attracted by the light, fly straight into their sticky snares.

### ENGAGE

#### Tap Prior Knowledge

Prior to conducting this activity, download images of several common predators, such as a lion, snake, eagle, or shark. As you display each photo for the class, have students identify the predator and its likely prey. Challenge students to explain how each predator hunts for prey.

### EXPLORE

#### Preview the Lesson

Display pages 10-11 of the projectable magazine. Have students examine the animal in the photo. Inform the class that this photo shows a peacock mantis shrimp. Point out that the text says the animals in this article are all predators with amazing and unexpected hunting techniques. Brainstorm ideas about how this shrimp might catch its food.

#### Set a Purpose and Read

Have students read the article in order to understand that some animals have special features that help them hunt prey and that predators live in all types of environments.

### EXPLAIN

#### Recognizing Special Features and Skills

After students read the article, display page 12 of the projectable magazine. Highlight the subhead "Copycat." Then read aloud the caption. Discuss reasons why this cat is a copycat and its cries can trick its prey. (The cat's voice copies the sound of baby monkeys. This gets the attention of adults and draws them toward the cat.) Point out to students that throughout the article, the subheads and captions give clues about how each animal captures prey. The text fills in the missing details. Give each student a copy of the **Content Assessment Master**. Tell students to select one predator from the article. Instruct them to write the subhead for that section, draw a picture of the animal, and write a short description telling how the animal captures its prey.

## SCIENCE

### EXPLAIN

(continued)

#### Introducing More Creative Carnivores

Display the "**Creative Carnivores**" poster. Discuss reasons why the poster's headline is appropriate for this topic. (Animals that hunt and eat other animals are carnivores. This article is about predators that hunt in unusual, or creative, ways.) As a class, read aloud the information about each animal. Discuss how each carnivore hunts for food. Compare each animal with the examples presented in the article.

#### Exploring a World of Innovative Predators

Instruct students to examine the article's photos in their student magazines. Tell them to focus on the background of each photo rather than the featured predator. **Ask:** *What do you notice?* Guide students to recognize that these predators live in a variety of different environments. Some live on land. Others live in water. Review the article for more details about where each predator lives. Have students study the animals on the "**Creative Carnivores**" poster, too. If necessary, have students conduct research to learn more about where each predators lives.

### ELABORATE

#### Find Out More

Inform students that between the article and the "**Creative Carnivores**" poster, they learned about several different predators that use unusual body parts or creative ways to hunt for prey. Divide the class into small groups. Instruct groups to conduct research to identify and learn about another creative predator. Invite groups to present what they learned to the class.

#### Extend Your Thinking About Predators

Remind students that the article told readers what unusual predators did to catch prey. But it didn't explain why. As a class, brainstorm reasons why each of these predators might have developed these unusual traits or techniques.

### EVALUATE

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

- *Why do margay cats copy the sounds of baby monkeys?* (to trick adult monkeys into coming toward them)
- *Why is a peacock mantis shrimp's punch so powerful?* (It's front limbs are like clubs and they move super fast.)
- *How is a netcasting spider's web different from other webs?* (It's a net. The spider throws the sticky net on its prey.)

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: Gotcha!**

Use this organizer to examine each vocabulary word.

<p>Write the definition.</p>	<p>Restate in your own words.</p>
<p>What is the word?</p>	
<p>Draw a picture.</p>	<p>Use the term in a sentence.</p>

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<p>What is the word?</p>	
<p>Draw a picture.</p>	<p>Use the term in a sentence.</p>

## LANGUAGE ARTS ASSESSMENT: Gotcha!

Write an important point the writer makes about each animal.  
Record reasons that support each point.

Animal	Point	Reasons
margay cat		
peacock mantis shrimp		
netcasting spider		
archerfish		
glowworm		

Name \_\_\_\_\_

Date \_\_\_\_\_

**CONTENT ASSESSMENT: Gotcha!**

Draw one animal from the article. Write the subhead. Explain how the animal captures prey.

**Subhead:**

**Draw**

**Explain**



**COMPREHENSION CHECK: Gotcha!**

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

1. What is an animal that kills and eats other animals called?

- Ⓐ a predator
- Ⓑ prey
- Ⓒ a copycat

2. What does a margay cat use to trick prey?

- Ⓐ smell
- Ⓑ sound
- Ⓒ taste

3. Which predator uses a net and droppings to catch prey?

- Ⓐ netcasting spider
- Ⓑ glowworm
- Ⓒ peacock mantis shrimp

4. What does an archerfish do to catch prey?

- Ⓐ walk, thump, crack
- Ⓑ wait, spit, hit
- Ⓒ weave, splash, throw

5. Pick one predator from the article or poster. Tell how it catches prey.

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# Black Blizzard!

LANGUAGE ARTS  540L

## Objectives

- Students will assess their familiarity with and knowledge of vocabulary words.
- Students will ask questions about dust storms and find answers in the text.
- Students will explain concepts based on information in the text.

## Resources

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

## Summary

- The article “Black Blizzard!” uses specific examples to introduce readers to the phenomenon of dust storms. As they read, students will examine the science behind and impact of dust storms around the globe.

## BUILD VOCABULARY AND CONCEPTS

- **dust**
- **predict**
- **soil**

As a class, discuss the difference between familiarity and knowledge. Tell students that the more familiar they are with something, the more knowledge they will have. Discuss how this concept applies to words when they read.

Display the vocabulary words on a word wall or on the whiteboard. Give each student a copy of the **Vocabulary Assessment Master**. Instruct students to write each word on their papers. Review the categories under the header “Familiarity with the Word.” Tell students to make a checkmark to show how well they know each word.

As a class, brainstorm ideas for what each means. Compose a class definition for each word. Have students write those definitions on their worksheets. Then display the Wordwise feature on page 23 of the projectable magazine. Have students write the article definitions on their worksheets, too. Have students compare the article’s definitions with the definitions the class wrote.

## READ

Let students know that the purpose of this article is to introduce them to dust storms. As they read, they will learn what dust storms are and how they can change the landscape.

Tell students that the best way to learn more about a subject is to ask themselves questions as they read the article. **Say:** *Good readers always do this. It helps them learn more about the topic. And asking questions isn’t as hard as you might think. Many questions begin with the same six question words: Who? What? Where? When? Why? and How?*

Display pages 18-19 of the projectable magazine. Read aloud the headline and text. Model how to ask and answer questions. **Say:** *When I look at this page, the first thing I notice is that the photo is black and white. Why isn’t it color? Then I look at the photo itself. What kind of a storm is this? Where did it come from? Why is the man’s hat blowing away in the wind?. The headline says this article is about a black blizzard. What exactly is that?* Encourage students to introduce new questions of their own.

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 write at least one question related to the article that begins with each question word. Challenge them to find the answers to their questions in the text. Instruct students to record the answers on their worksheets.

## LANGUAGE ARTS

### TURN AND TALK

Have students turn and talk to discuss what they learned about dust storms. **Ask:** *What is dust?* (fine, dry powder consisting of tiny particles of earth) *What besides dust flies around during a dust storm?* (sand and soil) *Why were there black blizzards in Oklahoma and Texas in the 1930s?* (It hadn't rained for a long time. The soil became dry and dusty. Strong winds blew the soil into the air.) Encourage students to share other facts they learned about dust storms.

- **Ask and Answer Questions** Remind students that asking and answering questions is a strategy that will help them understand what they read. **Say:** *Even the best readers come across words and ideas they don't understand. Asking questions shows you which answers you need to search for as you reread the text.* Have students share and compare their **Language Arts Assessment Masters** with a partner. Did they have the same questions? Did they find the same answers? If not, encourage partners to compare where in the text they each found the answer to reevaluate the results.

- **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 early warnings help keep people safe during a dust storm.

### 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 a dust storm?*
- *Why is wind an important part of a dust storm?*
- *What surprised you about what you read?*

# Black Blizzard!

## SCIENCE

### Objectives

- Students will understand what a dust storm is.
- Students will recognize how dust storms can change the landscape.

### Resources

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

### Science Background

Dust is a fine, dry powder consisting of tiny particles of earth. It is heavy enough to see and light enough to be carried by wind. And if enough dust is available, it can contribute to a storm that reaches thousands of meters high.

A dust storm can form over any dry region of Earth. This includes deserts, dried up lake beds, and even farmland or pastureland that has become exposed and dry.

As wind blows across areas like these, dust clouds begin to form. Particles of dust and sand bounce off each other. This keeps the particles aloft. If they happen to become caught in a thunderstorm, a violent dust storm called a haboob can occur.

Dust storms happen all over the world. Their effects can be harmful to people, who find it difficult to see or breathe.

They can also be harmful to the areas where they occur. In 1983, a dust storm struck Melbourne, Australia. In the end, the storm dumped more than 1,000 tons of dust on the city. It took many years and millions of dollars to repair the damage.

On the other hand, this dust may also settle in open farmland areas. Over time, those deposits of dust can develop into fertile soil where many crops can grow.

## ENGAGE

### Tap Prior Knowledge

Give each student a piece of plain white paper. Now inform them that they have 10 seconds to draw a picture of a black blizzard. When time is up, examine the results. How many students drew something resembling a dark, fat tornado? As a class, discuss what could have caused this storm to be black. Discuss reasons why it would be swirling.

## EXPLORE

### Preview the Lesson

Display pages 18-19 of the projectable magazine. As students examine the image, read aloud the headline and subhead. Invite students to share their opinions about what happens when fine dust, soil, and sand are captured by a turbulent wind. Encourage them to search for clues in the photo.

### Set a Purpose and Read

Have students read the article in order to understand what a dust storm is and to recognize how dust storms can change the landscape.

## EXPLAIN

### Understanding Dust Storms

Give students five minutes to examine the article's photos. Based on what they see, brainstorm ideas for a simple definition of a dust storm. Guide the class to understand that dust storms are dangerous storms with big clouds of dust, sand, and soil. Powerful winds make them move. Give each student a copy of the **Content Assessment Master**. As a class, review the article for details that explain what causes a dust storm to occur.

# Black Blizzard!

## SCIENCE

### EXPLAIN

(continued)

#### How Dust Storms Change the Landscape

Remind students that dust storms are storms that capture fine dust, soil, and sand. Strong winds move the clouds around. **Say:** *All of that dust, sand, and soil came from somewhere. And when those winds stop, it all has to go someplace new.* As a class, discuss how this could change the landscape. Then divide the class into small groups. Assign each group one section of the article. Instruct groups to reread their assigned sections to note how a dust storm changed the landscape. Instruct students to add this information to the bottom of their **Content Assessment Masters**.

### ELABORATE

#### Find Out More

Remind students that scientists are now learning how to predict dust storms. In 2011, scientists warned people that a dust storm was going to hit Phoenix, Arizona. People kept inside to stay safe. As a class, conduct research to learn what else people can do to protect themselves and their belongings from giant dust storms.

#### Extend Your Thinking About Dust Storms

Remind students that dust storms can travel great distances. As the article mentions, a dust storm in North Africa can blow across the Atlantic Ocean and drop sand in the U.S. All of that dust can also be carried out to sea. As a class, discuss the impact of dropping massive amounts of sand or dust on land or in the sea. Make a list of ways this event could change the landscape of an area or affect the plants and animals living there.

### EVALUATE

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

- *What does a dust storm look like?* (a wall of sand and dust)
- *Why are dust storms dangerous for people?* (They strike with little warning. You can't see or breathe in a dust storm. You can't escape.)
- *Why do people call dust storms "black blizzards?"* (Strong winds in the storms blow soil into the air. The storm looks black.)

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

Name \_\_\_\_\_

Date \_\_\_\_\_

**VOCABULARY ASSESSMENT: Black Blizzard!**

Record information from the article about each vocabulary word.

Word	Familiarity with the Word			Knowledge of the Word	
	I know the word very well.	I've seen or heard the word before.	I don't know the word.	What I think the word means:	How the article defines the word:

**LANGUAGE ARTS ASSESSMENT: Black Blizzard!**

Write one question about the article that begins with each question word.  
Find the answer in the text.

Question Word	My Question	My Answer
Who?		
What?		
Where?		
When?		
Why?		
How?		

**CONTENT ASSESSMENT: Black Blizzard!**

Explain what happens when a dust storm occurs. Summarize how a dust storm can change the environment.

**First:**

**Next:**

**Then:**

**Finally:**

**Summary:**



**COMPREHENSION CHECK: Black Blizzard!**

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

1. What kind of soil is easily picked up by a dust storm?  
Ⓐ hard  
Ⓑ wet  
Ⓒ dry
  
2. What besides soil is in the giant clouds of a dust storm?  
Ⓐ mud and clay  
Ⓑ dust and sand  
Ⓒ water and ice
  
3. What makes a dust storm build?  
Ⓐ strong winds  
Ⓑ bright sunshine  
Ⓒ lots of clouds
  
4. How many dust storms were there during the Dust Bowl?  
Ⓐ one  
Ⓑ a few  
Ⓒ many

5. Describe one way a dust storm can change the landscape.

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## ANSWER KEY

### Wandering Ways

#### 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 8.

**nomad:** a member of a group of people that has no permanent home and moves from place to place

**trade:** to exchange one thing for another

Sentences will vary depending on the connections students identify.

#### Assess Language Arts, page 7

Details from the text and photos will vary. Students should note that the maps tell where each group of nomads lives.

#### Assess Content, page 8

Answers will vary depending on which groups students choose to compare. However, students should note that both groups are nomads.

#### Comprehension Check, page 9

1. C; 2. A; 3. C; 4. C; 5: Answers will vary depending on which two groups students choose to compare.

### Gotcha!

#### Assess Vocabulary, page 14

Students should record the words and definitions from the Wordwise feature on page 16

**predator:** an animal that kills and eats other animals

**prey:** an animal hunted or caught by another for food

Students should restate each definition in their own words. Sentences and drawings will vary but should accurately reflect the meaning of each word.

#### Assess Language Arts, page 15

Responses may vary. All points and reasons should be stated directly in the article.

#### Assess Content page, 16

Answers will vary depending on which animal students choose to draw.

#### Comprehension Check, page 17

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

### Black Blizzard!

#### Assess Vocabulary, page 22

Students should record the vocabulary words from the Wordwise feature on page 23, make checkmarks to show how familiar they are with each word, and write definitions in their own words. Then they should record the definitions from the article.

**dust:** fine, dry powder consisting of tiny particles of earth

**predict:** to tell about in advance

**soil:** the top layer of earth in which plants grow

#### Assess Language Arts, page 23

Students should record one question that begins with each question word. Answers should come from the text.

#### Assess Content, page 24

Possible response: First, dry soil is picked up easily by the wind. Next, the wind blows and a dust cloud starts to build. Then, bits of sand and dust bounce off each other like pinballs. Finally, the dust cloud moves through the air.

#### Comprehension Check, page 25

1. C; 2. B; 3. A; 4: C; 5: Answers will vary but should come from the text.