

In This Guide

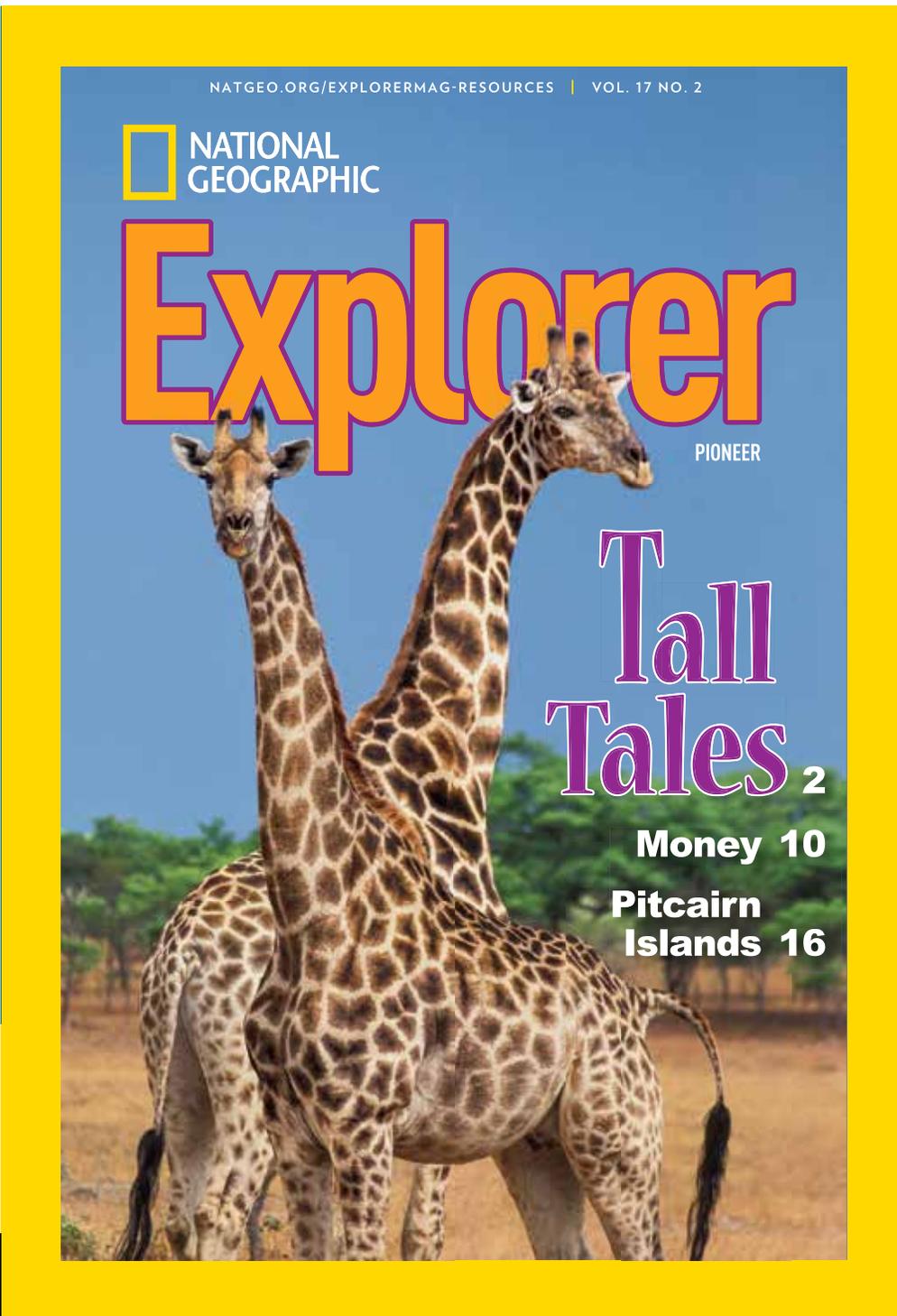
This guide contains language arts and science or social studies lessons for articles in this issue of EXPLORER PIONEER.

Explorer Magazine

EXPLORER classroom magazines are written for each grade, 2-5. Through great storytelling and stunning photographs, the magazines develop literacy skills and teach standards-based content aligned with the Common Core State Standards (CCSS), Next Generation Science Standards (NGSS), or National Council for the Social Studies (NCSS). The activity on the magazine's back cover is tailored to the NG Learning Framework. (see page 2)

EXPLORER magazines offer engaging reading opportunities for students with different ability levels in the same class. All articles have been measured using the Lexile® Framework for Reading. Articles in EXPLORER PIONEER will be within the 250-550L range.

For additional resources to extend your students' learning, visit EXPLORER's website, natgeo.org/explorermag-resources.



Your Subscription Includes:

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

INTRODUCTION

BACKGROUND

Since 1888, the National Geographic Society has funded scientists and explorers and shared their findings with the world. To support educators who use our resources, we have created a Learning Framework, which lays out what we believe students should learn from their experiences with the Society.

PURPOSE

The Learning Framework was designed to convey the Society's core beliefs and values. It is built around a set of attitudes, skills, and knowledge that embody the explorer mindset.

To determine the learning outcomes within the Learning Framework, we dug deep into national standards in key subject areas. We also sought advice from subject matter and child development experts, along with the combined expertise of NG instructional designers, researchers, and content developers. To learn more, go to: <https://www.nationalgeographic.org/education/learningframework/>.

IMPLEMENTATION

Each article in this magazine has a knowledge-based link to the Learning Framework. Students will use the skills and attitudes as they do the activity on the back cover. The activity relates to the article "In Search of Pristine Seas."

MINDSET OF AN EXPLORER

KEY FOCUS AREAS



Attitudes

National Geographic kids are:

CURIIOUS about how the world works, seeking out new and challenging experiences throughout their lives.

RESPONSIBLE, with concern for the welfare of other people, cultural resources, and the natural world. NG kids are respectful, considering multiple perspectives, and honoring others regardless of differences.

EMPOWERED to make a difference. NG kids act on curiosity, respect, and responsibility. They are adventurous and persist in the face of challenges.



Skills

National Geographic kids can:

OBSERVE and document the world around them and make sense of those observations.

COMMUNICATE experiences and ideas effectively through language and media. They are storytellers!

COLLABORATE with others to achieve goals.

SOLVE PROBLEMS by generating, evaluating, and implementing solutions after identifying alternatives, weighing trade-offs, and making well-reasoned decisions.



Knowledge

National Geographic kids understand:

THE HUMAN JOURNEY is all about where we have been, where we live now (and why), and where we are going.

OUR CHANGING PLANET encompasses all that coexists on our planet—interconnected through systems that generate and nurture each other.

WILDLIFE AND WILD PLACES inhabit our planet—from the butterflies in our backyards to the lions in Africa.

Standard Supported

- Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently. (CCSS.RI.2.5)

Resources

- Vocabulary Assessment Master (page 7)
- Language Arts Assessment Master (page 8)

Summary

- The article "Tall Tales" explores how new discoveries have changed people's ideas about giraffes and how this might impact conservation efforts in the future.

BUILD VOCABULARY AND CONCEPTS

- **conservation**
- **species**

Display the vocabulary words on a word wall or on a whiteboard. Say the words aloud and invite students to share what they know about each.

Give each student a copy of the **Vocabulary Assessment Master**. Instruct students to write each word and its definition on their papers. Then have students draw a picture to remind themselves of what each word means.

When students are finished drawing their interpretations of individual words, encourage them to share their ideas about how the words could be related to giraffes in small groups. Then challenge each student to sketch a larger picture showing how the two words are related in that context. Instruct students to label their representations of each term in their drawings.

READ

Display pages 2-3 of the projectable magazine. **Ask:** *What animal are you going to read about in this article? (giraffe)* **Say:** *Raise your hand if you used the photo to answer my question.* Guide the class to recognize that photos are a text feature that helps readers locate key facts quickly.

Point out that this article contains other text features that help in this way, too. Model how to identify and use text features to learn about a topic. **Say:** *I've seen lots of pictures of giraffes. As this photo shows, they are tall animals with long necks and brown spots. But then I noticed the deck. It tells me something I didn't know. Not all giraffes are the same. There's more than one species of giraffe! That's an important fact, and it was easy to find because it's in large type in the deck.*

Have students review the article to identify the headline, subheads, diagram, map, bold print, photos, and captions. Discuss how each text feature can help readers get information quickly.

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 one key fact they learned from each type of text feature in the article.

Tall Tales

LANGUAGE ARTS

TURN AND TALK

Have students turn and talk to discuss what they learned about giraffes. **Ask:** *What is a giraffe?* (Possible response: a very tall animal with long legs, a long neck, and brown spots) *Why didn't people know there was more than one species of giraffe?* (Nobody had studied giraffes closely because they're so common.) *Why are people worried about giraffes now?* (With the population of giraffes now divided into four groups, giraffes need to be protected from extinction.)

- **Interpreting Definitions** Have students turn and talk to share what they learned about the article's two vocabulary words. Encourage them to describe to classmates how their drawings tie the words together while accurately reflecting the definition of each word.

- **Using Text Features** After reading the article, divide the class into small groups. Instruct students to ask each other questions about giraffes. Encourage them to use the information they recorded on their **Language Arts Assessment Masters** to find the answers. Rejoin as a class. Discuss how using various text elements helped them quickly locate key information about giraffes in 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.

- *How can people help conserve giraffes?*
- *Why is "Easy to Spot" a good subhead to use in this article?*
- *What surprised you about what you read?*

Standard Supported

- There are many different kinds of living things in any area, and they exist in different places on land and in water. (NGSS.2-LS4-1)

Resources

- Content Assessment Master (page 9)
- Comprehension Check (page 10)

Science Background

Giraffes are giant animals. As newborns, they are about 1.9 meters (6 feet) tall and weigh around 68 kilograms (150 pounds). By the time they become adults, they can reach up to 5.8 meters (19 feet) tall and weigh up to 1,270 kilograms (2,800 pounds). They are the tallest land animals on Earth.

Other than humans, the giraffe's only predators are lions and crocodiles. Although giraffes can deliver deadly blows with their long, strong legs, they gain additional protection by living together in groups called towers. One giraffe can stand guard while others catch the five to 30 minutes of sleep they need each day.

Until recently, it was believed that all giraffes belonged to the same species. However, a study of giraffe DNA released in 2016 revealed that there are actually four different species of giraffe—the Masai giraffe, reticulated giraffe, southern giraffe, and northern giraffe. The different varieties can be distinguished by examining the animals' spots.

While interesting, these findings are also cause for alarm. Fewer than 100,000 giraffes remain living in the wild. Now we know that number is actually divided into four distinct groups. It is more important than ever to protect giraffes, which are now one of the most endangered large mammals in the world.

ENGAGE

Tap Prior Knowledge

Draw a stick figure representing a giraffe on the board. Instruct students to write the name of the animal this drawing reminds them of on a piece of paper. Then ask students to raise their hands if they wrote the word "giraffe." Discuss reasons why. Invite students to share what they know about giraffes.

EXPLORE

Preview the Lesson

Display the cover of the projectable magazine. Invite volunteers to describe the giraffes they see. Then have them describe the place where the giraffes live. **Ask:** *What is it like in this habitat?* (Possible response: There is brown grass on the ground and there are some tall trees in the background.) Point out the giraffes' long necks. **Ask:** *Looking at how long the giraffes' necks are, do you think they're more likely to eat grass or leaves? (leaves) Why?* (Their long necks allow them to reach the leaves.) Tell students that as they read the article they will learn how a giraffe's body parts help it survive. They will also learn about the differences between the four species of giraffes.

Set a Purpose and Read

Have students read the article in order to understand how a giraffe's body parts help it survive and to distinguish between the four species of giraffes.

EXPLAIN

Identify Body Parts that Help Giraffes Survive

Display pages 4-5 of the projectable magazine. Read aloud the information in the brown blurb. Point out that each caption in the diagram tells about a different part of a giraffe. Have students review the diagram in small groups. Rejoin as a class. Invite students to share what they learned. Then challenge them to explain how different parts of a giraffe's body parts help it survive in the environment where it lives. (Possible responses: Brown spots help a giraffe blend in with a brown landscape. Long legs and a long neck help it reach the leaves it likes to eat. Long legs also help it run fast to escape from predators.)

Distinguish Between Giraffe Species

Display pages 6-7 of the projectable magazine. As a class, study the photos. Invite volunteers to identify similarities between the four giraffe species. (Possible responses; All have long legs, long necks, small heads, horns, and brown spots. All live in Africa.) Point out the map. Have students note differences in where the four species of giraffes live. Then review the section "Not All the Same." Combined with what they see in the photos, challenge students to identify key differences in the spots on the four species of giraffes. Give each student a copy of the **Content Assessment Master**. Instruct each student to select one species of giraffe and color the outline of the giraffe in a way that accurately reflects the color, size, shape, and location of its spots. Have students identify the giraffe and describe its spots. Challenge them to explain how the spots prove the giraffe belongs to this species.

ELABORATE

Find Out More

Point out to students that the article describes the physical traits of giraffes in detail. But it doesn't tell much about their behaviors. Divide the class into small groups. Have groups conduct research to learn about the habits and behaviors of giraffes. Invite groups to present their findings to the class.

Extend Your Thinking About Giraffes

Remind students that until recently, scientists had not studied giraffes in detail. As a class, discuss reasons why scientists might not have wanted to study giraffes. Challenge students to identify reasons why giraffes should be the subject of further research.

EVALUATE

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

- *What are the four species of giraffes?* (Masai giraffe, reticulated giraffe, northern giraffe, and southern giraffe)
- *What protects a giraffe's eyes from thorns in trees?* (long eyelashes and thick eyelids)
- *How do a giraffe's spots help it survive?* (The spots are help the giraffe blend in with its brown habitat.)

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

VOCABULARY ASSESSMENT: Tall Tales

Record each vocabulary word and its definition. Draw a small picture to show what each word means.

Word	Definition	Picture

Draw a larger picture that shows how the words are related to giraffes.
Add labels to show how you included each word in your drawing.



LANGUAGE ARTS ASSESSMENT: Tall Tales

Record one key fact you learned from each type of text featured in the article.

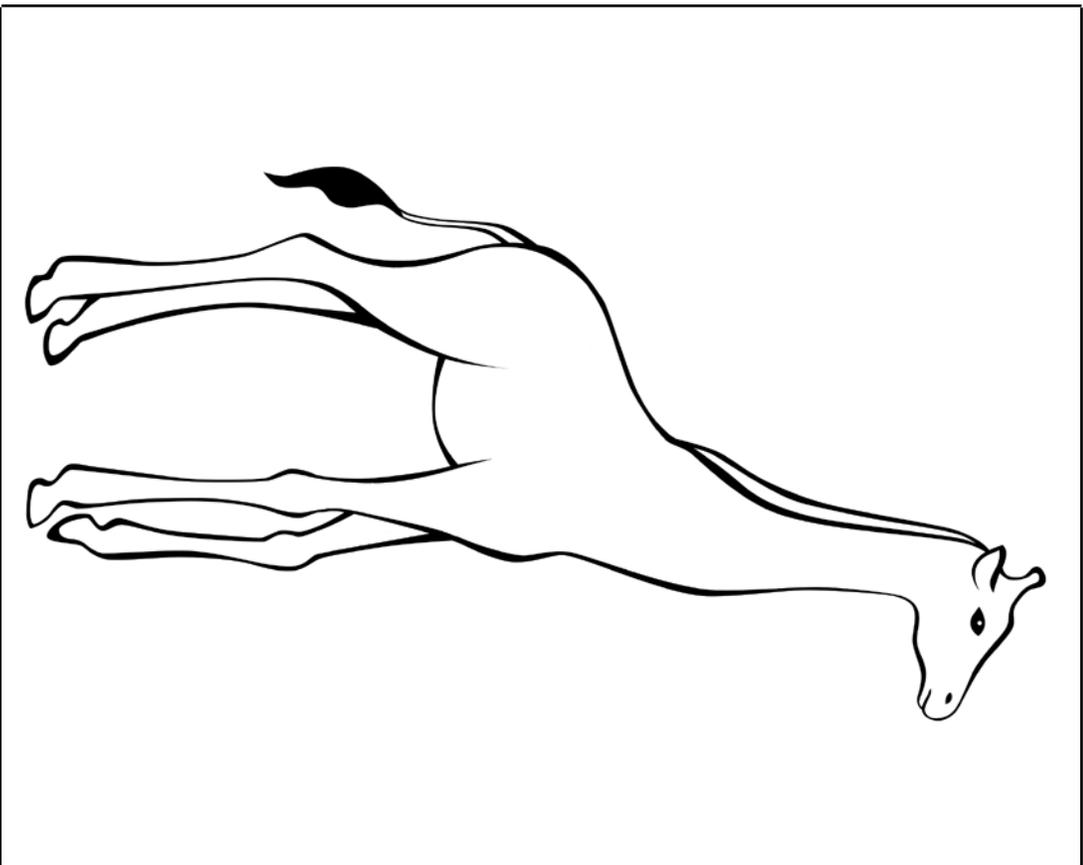
Text Feature	Fact
headline	
subhead	
diagram	
map	
bold print	
photo	
caption	

Name _____

Date _____

CONTENT ASSESSMENT: Tall Tales

Pick one giraffe species. Draw and color the giraffe's species. Identify the giraffe. Describe its spots. Explain how the spots prove the giraffe belongs to this species.



Identify:

Describe:

Explain:

COMPREHENSION CHECK: Tall Tales

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

1. How many giraffe species are there?
Ⓐ one
Ⓑ three
Ⓒ four

2. How many giraffe species did people think there were?
Ⓐ one
Ⓑ three
Ⓒ four

3. Which giraffe species has spots that are marked like a net?
Ⓐ Masai giraffe
Ⓑ reticulated giraffe
Ⓒ northern giraffe

4. Which sentence is true?
Ⓐ Giraffes have powerful legs.
Ⓑ Giraffes have five stomachs.
Ⓒ Giraffes eat a lot of grass.

5. Why is it important to protect giraffes?

Show Me the Money!

LANGUAGE ARTS 550L

Standard Supported

- Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (CCSS. RI.2.3)

Resources

- Vocabulary Assessment Master (page 15)
- Language Arts Assessment Master (page 16)

Summary

- The article "Show Me the Money!" examines the history of trade and money.

BUILD VOCABULARY AND CONCEPTS

- **barter**
- **currency**
- **value**

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

In small groups, have students find and record text and visual clues in the article that are related to each vocabulary word. Then instruct each student to record his or her own idea about what each word means. Invite volunteers to read aloud the definitions from the Wordwise feature on page 15 of their student magazines. Have students record those definitions on their worksheets. Encourage 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 examine the history of trade and money. As they read, they'll learn what people use to trade and how and why that has changed over time.

Explain to students that as they read, they will notice relationships between ideas in the text. For example, events happen in a specific order. This is known as sequence or chronology. **Say:** *When writers use chronology, they often use words like "first," "next," "then," and "finally." This helps you track the order of events as they occur.*

Give each student a copy of the **Language Arts Assessment Master**. Have students read the article in small groups. As students read, instruct them to search for information that tells how trade has changed over time. Encourage group members to work together to write a full description of the most important historical events. If necessary, remind them to record the events in the order they occurred.

TURN AND TALK

Have students turn and talk to discuss what they learned about money. **Ask:** *What is value?* (the worth of an object) *What were the first things of value that people started to use as money?* (shells) *What are some foods that people have valued enough to use as money?* (salt, parmigiano cheese, and bricks of tea leaves) Invite students to share other things they learned about money.

- **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 Masters** as a resource. Remind students to be original. They shouldn't restate sentences from the article. They should create new sentences of their own.

- **Describe Connections** Remind students that this article explains how trade has evolved over time. **Say:** *This is a process. As in every process, there are steps. And if you skip over one step, you won't have an accurate understanding of the history of trade.* Instruct two groups to compare the descriptions they recorded on their **Language Arts Assessment Masters**. Did they each record an accurate accounting of the steps? Were their steps in the proper order? If not, encourage students to review the article once again. Once all groups are satisfied that their accounts are accurate, review the information as a class to ensure that all students fully understand the history of trade.

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 currency?*
- *If you could pick one everyday item to use as currency, what would it be? Why?*
- *What surprised you about what you read?*

Show Me the Money!

SOCIAL STUDIES

Standard Supported

- Identify the benefits and costs of making various personal decisions. (NCSS.D2.Eco.2.K-2)
- Describe the role of banks in an economy. (NCSS.DS.Eco.9.K-2)

Resources

- Content Assessment Master (page 17)
- Comprehension Check (page 18)

Social Studies Background

In modern society, money is a fact of life. People use money to buy the things they want or need. But that wasn't always the case. And the type of money we use today is quite different from the currencies people used thousands of years ago.

It all began with barter, or the exchange of one good or service for another. Bartering worked well when people wanted to trade objects of equal value. But it didn't work when the trades became more complex.

Because of that, people created a new system. They assigned values to objects that were beautiful, interesting, or rare. They used those items as currency.

About 3,500 years ago, people in Africa and China used a small shell called a cowrie as currency. Native Americans and early North American colonists traded wampum, a white cylindrical shell that they used as beads to embroider or decorate belts and other ornamental objects.

Coins were first used in Turkey around 630 B.C. Paper money, which was much more convenient for larger purchases, first appeared in China about 910 A.D.

Today, only eight percent of transactions involve physical cash. The rest are digital trades conducted electronically through bits and bytes on computers.

ENGAGE

Tap Prior Knowledge

Encourage students to think about the last time they or their parents bought something. Poll the class to see if they paid for the items with cash, credit cards, or some other means. As a class, compare and contrast the different types of payment.

EXPLORE

Preview the Lesson

Display pages 10-11 of the projectable magazine. Point out the first four words in the subhead. **Ask:** *What do these words mean?* (They are all names for money.) As a class, brainstorm a list of other words that people use when they're talking about money.

Set a Purpose and Read

Have students read the article to understand how people use money to get the things they need, the history of trade, and the role of banks.

EXPLAIN

Understanding the History of Trade

Display page 12 of the projectable magazine. **Ask:** *Why are we looking at a picture of fish and corn in an article about money?* Invite volunteers to share their ideas. Then point out that this is an illustration of bartering. **Say:** *Long ago, before we had money, people bartered or traded to get the things they needed. But in order for bartering to work, the two items had to have similar value. Otherwise, it wasn't a fair trade. That's one reason people started to use money. Money made it easier to have a fair trade.* As a class, review the rest of the article. Examine how the introduction of shells and other valuable items, coins, paper money, and money on computers have affected the way people trade. Then give each student a copy of the **Content Assessment Master**. Instruct students to draw one picture of people bartering. Tell them to identify each object. Then have them draw a picture of something they could buy with money. Have them guess how much it would cost. Inform students that each drawing must show a fair trade.

Show Me the Money!

SOCIAL STUDIES

EXPLAIN

(continued)

Understanding The Role of Banks

Poll the class to see how many students think that banks make the money people use. Then display page 13 of the projectable magazine. Review the section "Making Money." **Say:** *In the United States, we have special places that make money. Dollar bills are made by the U.S. Bureau of Engraving and Printing. Coins come from the U.S. Mint.* Guide students to understand that once the money is made, people can start to use it. And to keep their money safe, people often store it in a bank. Invite students to share what they know about their local bank.

ELABORATE

Find Out More

Display pages 14-15 of the projectable magazine. Point out to the class that this sidebar gives examples of strange and wonderful things that have been used as money in the past. As a class, conduct research to identify more strange and wonderful things that people have used as money.

Extend Your Thinking About Money

Display page 13 of the projectable magazine. Point out to the class a \$1 bill lasts about 5.8 years. But a \$100 bill can last for up to 15 years. Challenge students to explain why.

EVALUATE

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

- *What is currency?* (money in any form that is used in trade)
- *What is wampum?* (beads made from shells that Native Americans used as money)
- *Why did people start to use paper money?* (People wanted something lighter than coins to carry.)

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

Name _____

Date _____

VOCABULARY ASSESSMENT: Show Me the Money!

Record information from the article about each vocabulary word.

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

LANGUAGE ARTS ASSESSMENT: Show Me the Money!

Describe how the process of trade evolved over time.

First, _____

Next, _____

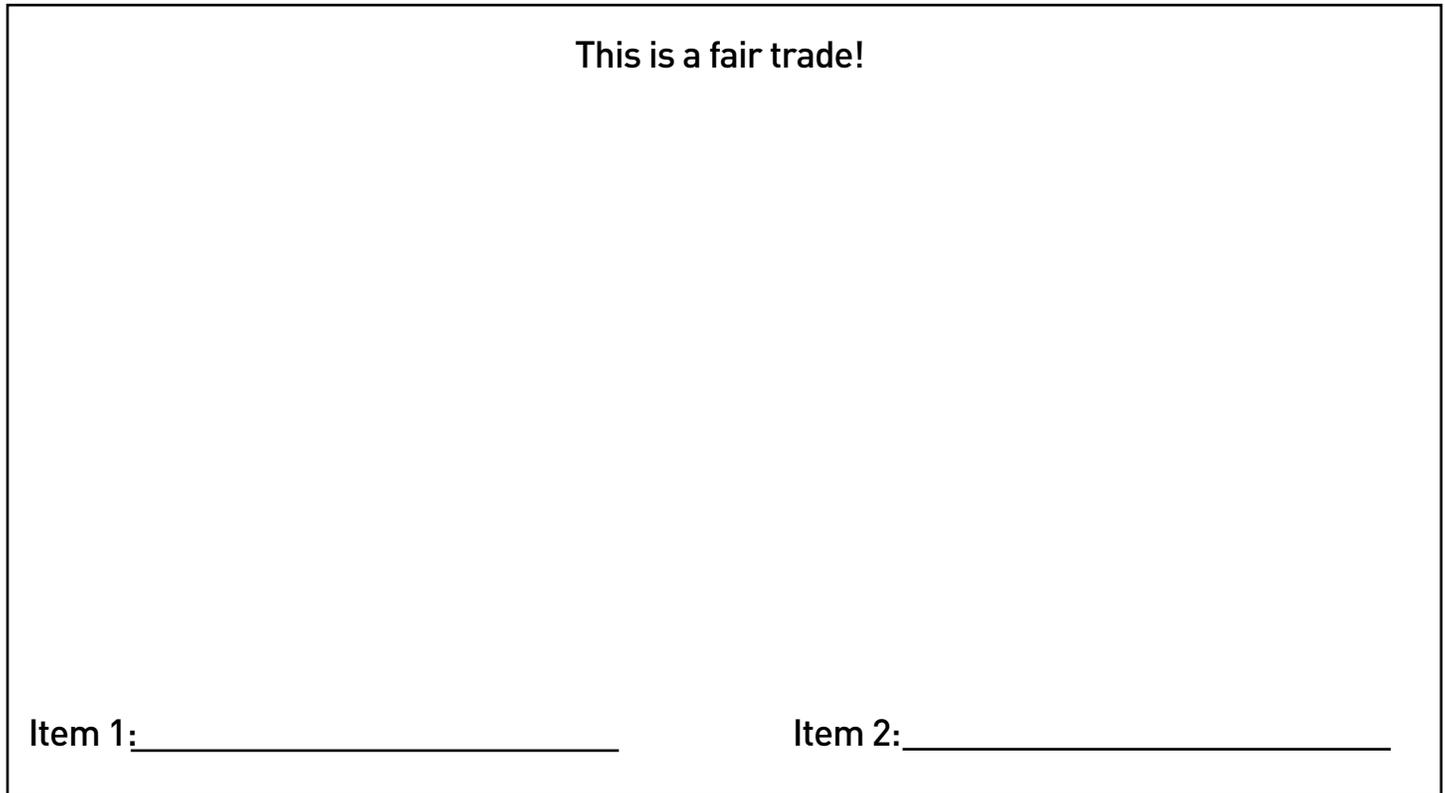
Then, _____

Finally, _____

CONTENT ASSESSMENT: Show Me the Money!

Draw a picture of people bartering. Identify each item they will trade.

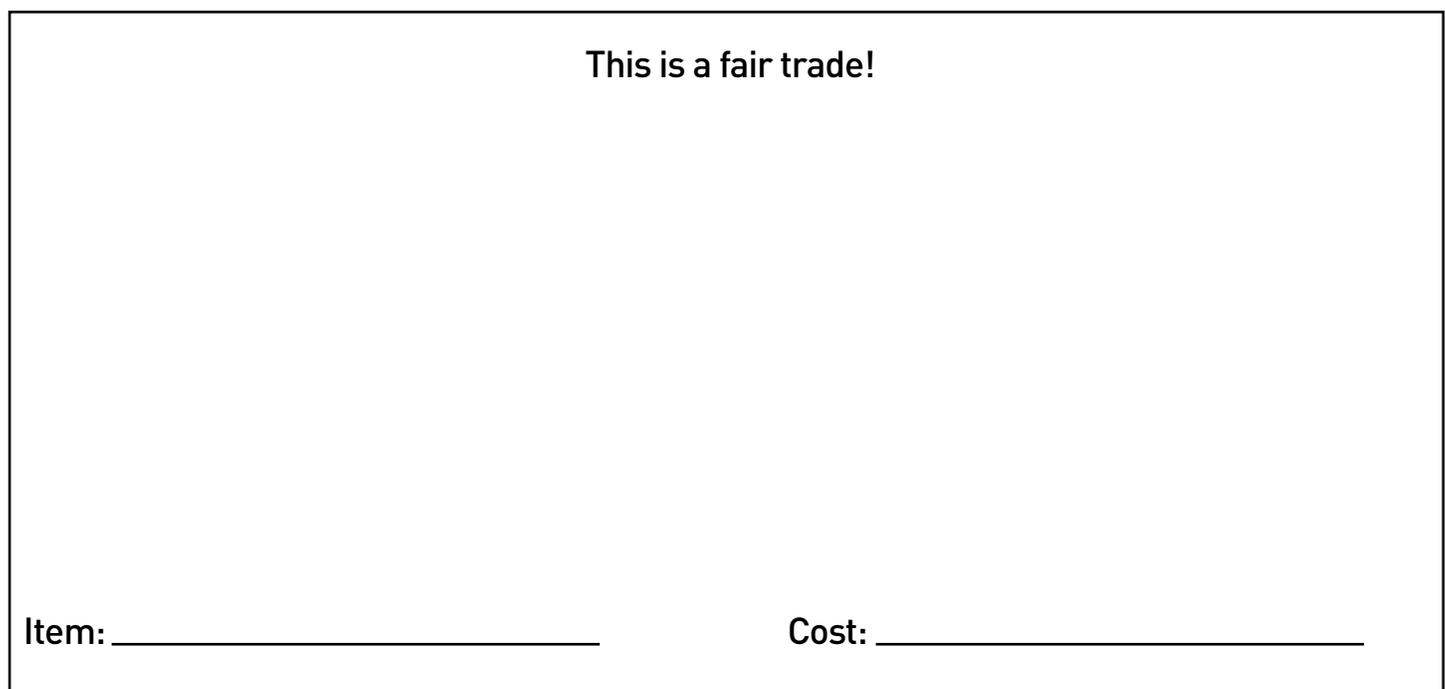
This is a fair trade!



Item 1: _____ Item 2: _____

Draw a picture of something you could buy with money. Tell how much you think it will cost.

This is a fair trade!



Item: _____ Cost: _____

COMPREHENSION CHECK: Show Me the Money!

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

1. What happens when people barter?

- Ⓐ One person buys something.
- Ⓑ Two people trade things.
- Ⓒ Many people find shells.

2. Which of these is a fair trade?

- Ⓐ an apple for an orange
- Ⓑ a banana for a bike
- Ⓒ 200 apples for one grape

3. Where did people make the first coins?

- Ⓐ the United States
- Ⓑ China
- Ⓒ Turkey

4. What do banks do?

- Ⓐ make money
- Ⓑ sell money
- Ⓒ keep money safe

5. Tell how people use money to get the things they need.

In Search of Pristine Seas

LANGUAGE ARTS  LEXILE 480L

Standard Supported

- Identify the main topic of a multiparagraph text as well as the focus of specific paragraphs within the text. (CCSS.RI.2.2)

Resources

- Vocabulary Assessment Master (page 23)
- Language Arts Assessment Master (page 24)

Summary

- The article "In Search of Pristine Seas" is a first-person account of Dr. Enric Sala's expedition to the Pitcairn Islands and his efforts to establish this area as a protected marine ecosystem.

BUILD VOCABULARY AND CONCEPTS

- **atoll**
- **ecosystem**
- **mutineer**
- **lagoon**
- **pristine**

Give each student a copy of the **Vocabulary Assessment Master**. Instruct students to record each vocabulary word as you read it aloud from the Wordwise feature on page 23.

Divide the class into pairs. Point out to students that they may have heard some or all of these words before. Using that background knowledge as a base, instruct partners to predict and write a definition for each word. Then have them write a sentence for each word, based on the definitions they wrote.

Display the Wordwise feature on page 23 of the projectable magazine. First, instruct students to make sure they spelled each word correctly. Then review the definitions as a class. Have students add these definitions to their worksheets. With their partners, have students write a new sentence for each word that accurately reflects how it was defined in the article.

READ

Give students a few minutes to scan the article in their student 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 the class 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, the first thing I notice is the photo. It's hard not to notice a picture of a man swimming with sharks. But then I see the headline, "In Search of Pristine Seas." I wonder what that means?*

Explain to students that the headline and photo are often great clues that can help readers figure out what an article is about. **Say:** *But sometimes clues that aren't so obvious are even more helpful, particularly if you aren't sure what a word in the headline—such as *pristine*—means. Zoom in on the comprehension strategy in the lower left corner of the photo and read it aloud. **Say:** *Now I know what this article is about. It is going to tell how people can affect ocean habitats.**

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

In Search of Pristine Seas

LANGUAGE ARTS

TURN AND TALK

Have students turn and talk to discuss what they learned about pristine seas. **Ask:** *What does the word pristine mean?* (untouched, unpolluted) *What do pristine seas look like?* (Possible response: There are lots of corals, fish, and sharks. The water is clear.) *Why aren't more of the world's oceans pristine?* (Possible response: People have done things to damage the ecosystems.) Encourage students to share other interesting facts they learned about pristine seas.

- **Predicting Definitions** Have students turn and talk to discuss what they learned about the article's vocabulary words in small groups. Encourage them to compare the before and after sentences they wrote for each word. As a class, examine how new knowledge contributes to students' understanding of each word.

- **Identify Main Ideas** Remind students that the article has a main idea. (People can affect ocean habitats.) 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 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.

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 ecosystem like in a pristine sea?*
- *How can people cause an ocean ecosystem to become damaged or polluted?*
- *What surprised you about what you read?*

Standard Supported

- Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (NGSS.K-2-ETS1-3) (secondary to 2-ESS2-1)

Resources

- Content Assessment Master (page 25)
- Comprehension Check (page 26)

Science Background

As a boy, growing up on the Mediterranean coast of Spain, Dr. Enric Sala loved the sea. His fascination with the ocean led him to become a marine ecologist. But after years of working in academia, Sala came to a realization. The ocean is dying. And he wanted to find a cure.

To do that, Sala took his career in a different direction. In 2008, he became a National Geographic Explorer-in-Residence. His project, Pristine Seas, combines science, exploration, and media. His goal is to collect essential data that will convince governments to create new policies to protect the last pristine marine ecosystems in the world.

This is no small task. The ocean covers 70 percent of the planet. It is home to an incredible diversity of life. It provides food, jobs, and even half of the oxygen we breathe. But people are taking too many fish out of the ocean. They are polluting the oceans and making them warmer and more acidic.

Despite this, only three percent of the ocean's waters are currently protected. Through Pristine Seas, Sala is working to increase that number. So far, Sala has gone on 23 expeditions. His work has helped protect 4.4 million square kilometers (1.7 million square miles) of ocean territory. It has also led to the creation of 13 marine reserves.

ENGAGE

Tap Prior Knowledge

Display a globe. Point out all of the blue areas on the globe that represent the ocean. As a class, identify plants and animals that live in the ocean. Then ask students to imagine that the ocean somehow changed. Discuss what could happen to the plants and animals that lived there.

EXPLORE

Preview the Lesson

Display pages 16-17 of the projectable magazine. Read aloud the headline. **Ask:** *What is this article about?* (the search for pristine seas) Remind students that the word *pristine* means "unspoiled." As a class, discuss reasons why the ocean shown in this photo could be described as pristine. Brainstorm a list of ways the ocean here could change if it became damaged or polluted by people.

Set a Purpose and Read

Have students read the article in order to understand how Dr. Enric Sala and his team are trying to protect the ocean.

In Search of Pristine Seas

SCIENCE

EXPLAIN

Protecting the Oceans

Display page 18 of the projectable magazine. Zoom in on the illustration of the globe and point out the Pitcairn Islands. **Ask:** *Why do you think Dr. Enric Sala went here to find pristine seas?* (Possible response: The Pitcairn Islands are very remote. That makes them less likely to be spoiled by human activities.) Instruct students to examine the article's photos in their student magazines. **Say:** *Sometimes when you want to solve a problem, it helps to see the results you could potentially achieve. That's what Sala hoped to find here.* Divide the class into small groups. Have groups review the article to examine conditions on each island Sala visited. Then give each student a copy of the **Content Assessment Master**. Using information from the article as a guide, instruct students to draw pictures of a sea that is pristine and one that is not. Then have them describe how humans harm the ocean and explain how Sala hopes to protect it.

ELABORATE

Find Out More

Divide the class into small groups. Instruct groups to visit the "Pristine Seas" site at: <http://www.nationalgeographic.org/projects/pristine-seas/>. Inform students that the Pitcairn Islands are just one of 23 ocean ecosystems that Dr. Enric Sala and his team have explored. Each location they've visited is marked with a clickable dot on this globe. Have each group select one location on the globe. Instruct them to write a short report describing the impact Sala's research has had on the area.

Extend Your Thinking About Problem Solving

Point out to students that they don't have to travel to remote locations like the Pitcairn Islands to solve problems. There are plenty of problems to solve here at home. Display the back cover of this month's magazine. Review the information about "Problem Solving" with the class. Identify a list of ways that people commonly waste resources. Brainstorm potential solutions. Encourage each student to pick one idea and draw a picture of his or her solution.

EVALUATE

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

- *What is a lagoon?* (a shallow body of water separated from the sea by a reef)
- *Why is it important to have sharks in an ocean ecosystem?* (Sharks are top predators. When they are present, the ecosystem is healthy.)
- *What did Sala's research help create?* (a protected area around the Pitcairn Islands)

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

Name _____

Date _____

VOCABULARY ASSESSMENT: In Search of Pristine Seas

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

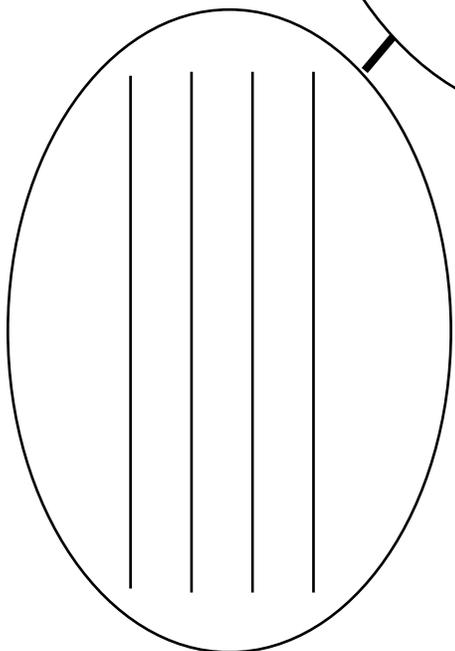
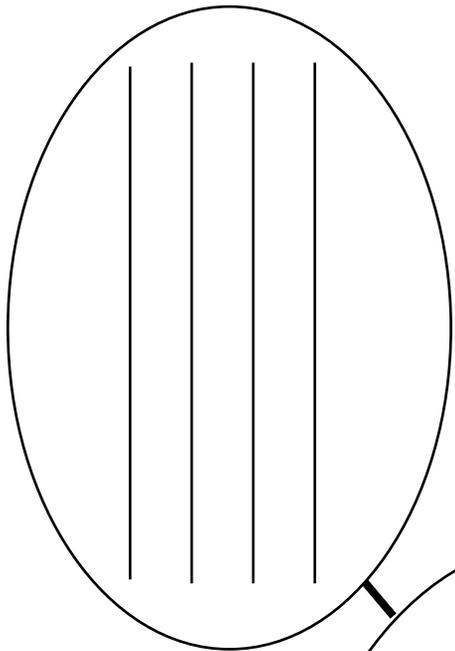
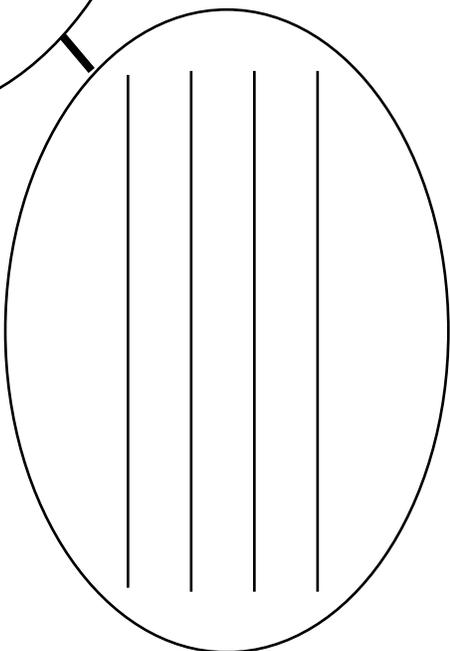
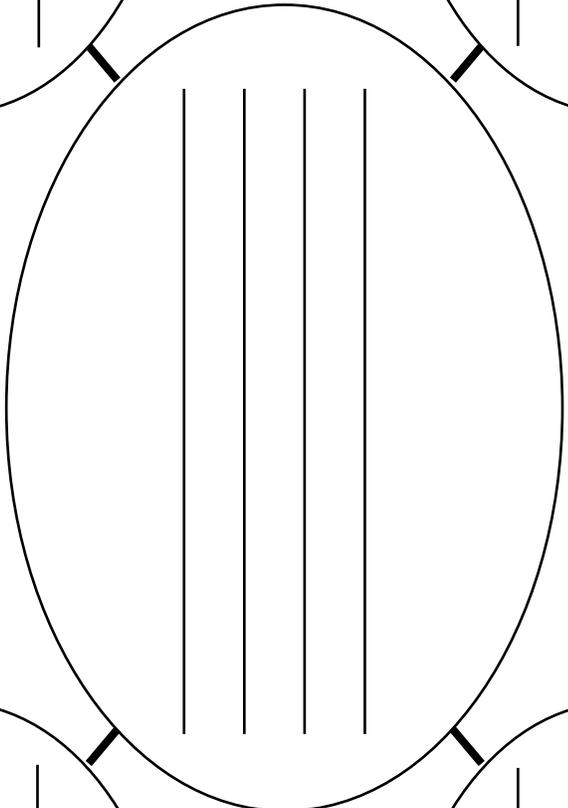
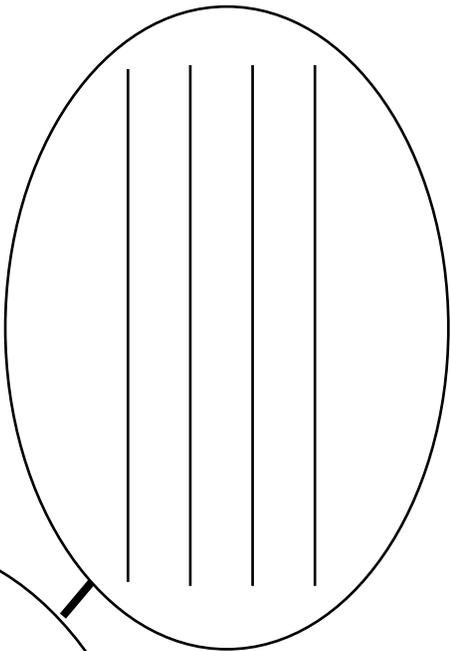
Word					
Predicted Definition					
Sentence					
Definition from the Article					
Sentence					

Name _____

Date _____

LANGUAGE ARTS ASSESSMENT: In Search of Pristine Seas

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



Name _____

Date _____

CONTENT ASSESSMENT: In Search of Pristine Seas

Draw a picture of a pristine sea and one that is not pristine.

pristine	not pristine
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Describe how human activities harm the ocean. _____

Explain how Dr. Enric Sala and his team are trying to protect the oceans. _____

COMPREHENSION CHECK: In Search of Pristine Seas

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

1. What is the water like in a pristine sea?
 A clear
 B cloudy
 C polluted
2. What do you see lots of in a healthy ocean ecosystem?
 A pollution
 B sharks
 C ships
3. The Pitcairn Islands are in which ocean?
 A Atlantic Ocean
 B Pacific Ocean
 C Indian Ocean
4. What human activity is harming the Pitcairn Islands?
 A fishing
 B surfing
 C scuba diving

5. Tell what you would see in a pristine ocean ecosystem.

Understanding Maps

AFRICA

Standard Supported

- Use maps, globes, and other simple geographic models to identify cultural and environmental characteristics of places. (NCSS.D2.Geo.3.K-2)

Resources

- Content Assessment Master (page 28)
- Comprehension Check (page 29)
- Africa Physical Map poster (teacher's edition)
- Africa Political Map poster (teacher's edition)

Social Studies Background

Spatial thinking is an essential skill for students to develop as they learn about geography and Earth and environmental sciences. Developing spatial concepts takes time and practice. Recognizing that, each month Explorer magazine will introduce students to a new set of physical and political maps. Use the accompanying lessons to guide students as they learn to recognize spaces and places in the natural world.

ENGAGE

Tap Prior Knowledge

Give students three minutes to make a list of things they know about Africa. Review the lists. Which items were recorded most often? Which are most amazing? Note any questionable items that show students could benefit from learning more about Africa.

EXPLORE

Preview the Lesson

Display the **Africa Physical Map poster** and the **Africa Political Map poster**. Cover the captions. Then instruct students to examine the photos. As a class, discuss what each photo might reveal about Africa.

Set a Purpose and Read

Have students examine the posters in order to understand that physical and political maps can be used to describe the cultural and environmental characteristics of a location.

EXPLAIN

Explore the Physical Map

Display the **Africa Physical Map poster**. Invite a volunteer to read aloud the text in the "Landforms" box at the top of the poster. Challenge the student to locate the Sahara on the map. Review the other boxes in this same way. Then read aloud the captions for each photo. Invite students to share what the map taught them about the physical characteristics of Africa.

Explore the Political Map

Display the **World Political Map poster**. Invite volunteers to read aloud the captions and the text in the boxes at the top of the poster. Have them find each location mentioned on the map. Then point out that the map key identifies country capitals and cities. As a class, locate a few capitals on the map. Then name a capital and challenge students to find the country where it is located.

ELABORATE

Find Out More

Point out to students that color is an important part of both physical and political maps. **Say:** *On these maps, Africa is very colorful. But the two other continents shown, Europe and Asia, are gray.* **Ask:** *Why would the mapmaker want to include Europe and Asia on these maps?* (to help readers understand how Africa fits in on a global context)

Extend Your Thinking About Africa

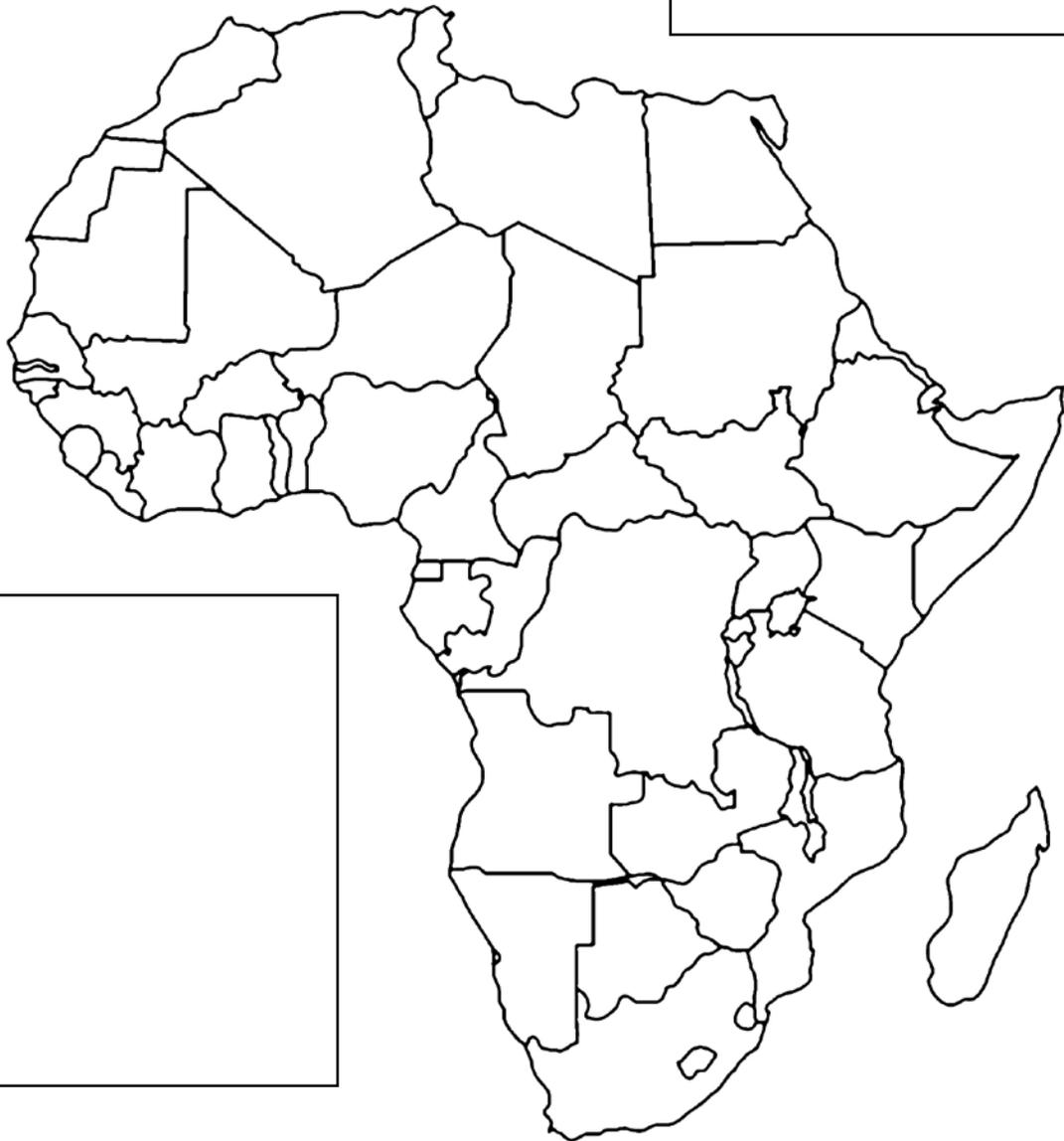
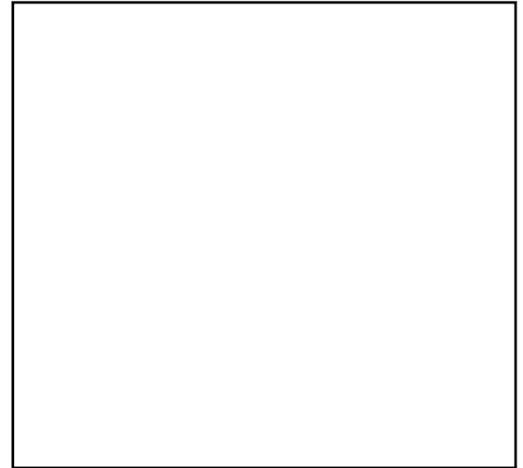
Give each student a copy of the **Africa Map Content Assessment Master**. In small groups, have students label five countries in Africa. Then have groups conduct research to find one more political fact and one more physical fact about Africa. Have students record and illustrate each fact on their maps.

EVALUATE

Have students ask and answer questions about the physical and political maps. If you wish, have them complete the **Comprehension Check** to assess their knowledge of African geography.

CONTENT ASSESSMENT: Africa Map

Label five countries in Africa. Write a new physical fact and a new political fact about Africa. Draw a picture to illustrate each fact.



COMPREHENSION CHECK: Africa Map

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

1. What is the smallest country in Africa?
Ⓐ Algeria
Ⓑ Seychelles
Ⓒ Libya

2. What is the Sahara?
Ⓐ a grassland
Ⓑ a desert
Ⓒ a mountain range

3. What type of landform covers most of Central Africa?
Ⓐ desert
Ⓑ mountains
Ⓒ rain forest

4. What is the largest single ethnic group in South Africa?
Ⓐ Afrobeats
Ⓑ Zulu
Ⓒ Botswana

5. Write one political fact and one physical fact you learned about Africa.

Tall Tales

Assess Vocabulary, page 7

Students should record the words and definitions from the Wordwise feature on page 9.

conservation: protection of animals, plants, or other natural resources

species: a group of animals or plants that are similar and can produce young animals or plants

Sketches should accurately reflect the meaning of each word. The larger picture should show how the words are connected. Students should label their representation of each word in the larger picture.

Assess Language Arts, page 8

Students should record one fact from the article directly related to each text feature.

Assess Content, page 9

Students should identify and color one giraffe as described below:

Masai giraffe: brown, leaf-shaped spots; It looks like it's wearing white socks.

northern giraffe: dark brown spots that are arranged like a net; no spots on its legs

reticulated giraffe: big brown spots; the photo shows the spots cover its legs

southern giraffe: dark brown spots; the photo shows the spots go down the legs

Students should use the information about each species to describe the spots on the giraffe they selected. They should use information about other species to explain why their drawing doesn't belong to one of these species.

Comprehension Check, page 10

1. C; 2. A; 3. B; 4. A; 5: Possible response: There are four species. The number of each species is smaller than we thought. If we don't protect giraffes, they will become extinct.

Show Me the Money!

Assess Vocabulary, page 15

Students should record the words and definitions from the Wordwise feature on page 15.

barter: the exchange of goods and services for other goods and services

currency: money in any form that is used in trade

value: the worth of an object

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

Assess Language Arts, page 16

Possible response: First, people bartered, or traded, goods and service. Next, they used beautiful or rare objects like shells to trade for the things they needed. Then, people made metal coins and paper bills, which they used as currency. Finally, people started trading with credit cards. With credit cards, the use computers to move money from one place to another.

Assess Content, page 17

Students should draw and identify two things that constitute a fair trade. They should draw another picture of something they could buy with money. The cost they identify for that item may or may not be an actual reflection of its true value.

Comprehension Check, page 18

1. B; 2. A; 3. C; 4: C; 5: Answers will vary, but students should note that people exchange money for the things they want and need.

ANSWER KEY

In Search of Pristine Seas

Assess Vocabulary, page 23

Students' predictions and the sentences they write will vary. They should record the words and definitions from the Wordwise feature on page 23.

atoll: a ring-shaped reef, island, or chain of islands made of corals

ecosystem: a community of plants and animals that depend on the same environment

mutineer: a person, especially a soldier or sailor, who rebels or refuses to obey the orders of a person in authority

lagoon: a shallow body of water separated from the sea by a reef

pristine: untouched, unpolluted

Assess Language Arts, page 24

Students should record the main idea of the article. (People do things that can affect ocean habitats.) Additional responses will vary, depending on which paragraphs students choose to investigate.

Assess Content, page 25

Drawings will vary, but students should include several sharks in their drawing of a pristine sea. There should be no sharks in the other drawing. They may also want to show a fishing boat.

Describe: People pollute the water and remove important species like sharks that keep the ecosystem healthy.

Explain: Sala and his team study areas and report on their condition. They convince people to protect the ocean waters around them.

Comprehension Check, page 26

1. A; 2. B; 3. B; 4. A; 5: Answers will vary, but students should note that there would be lots of fish, sharks, and corals and the water would be clear.

Africa Map

Assess Content, page 28

Students should correctly label five countries in Africa. They should write and illustrate one new physical fact and one new political fact about Africa.

Comprehension Check, page 29

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