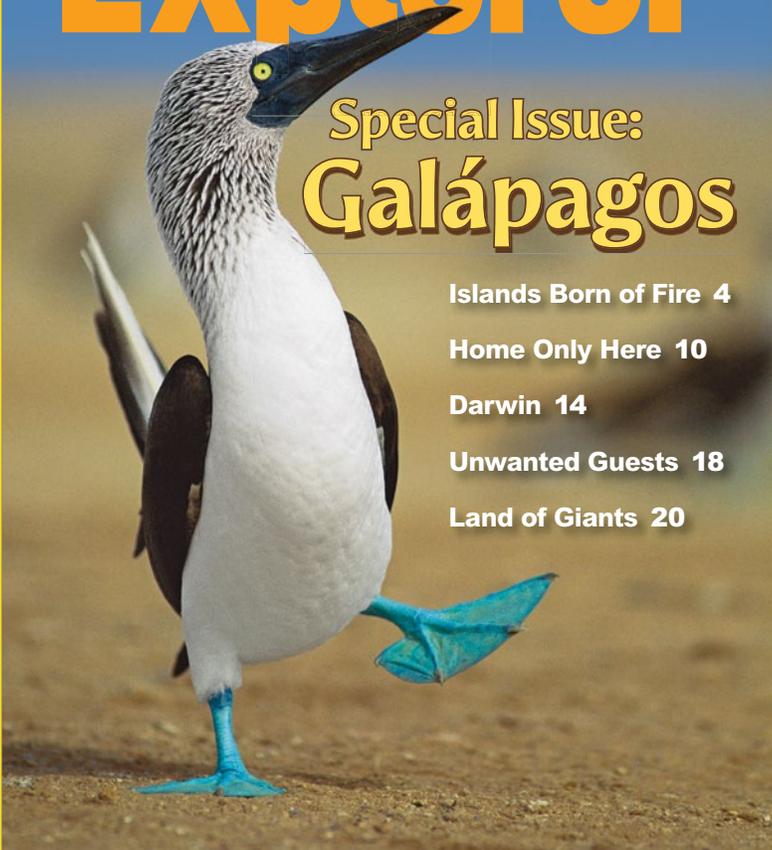




# Explorer

## Special Issue: Galápagos



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## TEACHER'S GUIDE Pathfinder and Adventurer Vol. 19 No. 2

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Educational consultant **Stephanie Harvey** has helped shape the instructional vision for this Teacher's Guide. Her goal is to ensure you have the tools you need to enhance student understanding and engagement with nonfiction text.

### Lexile® Framework Levels

#### Pathfinder

- Islands Born of Fire ..... 740
- Home Only Here/Unwanted Guests..... 800/760
- Darwin/Land of Giants..... 760/800

#### Adventurer

- Islands Born of Fire ..... 840
- Home Only Here/Unwanted Guests..... 880/910
- Darwin/Land of Giants..... 870/930

### Standards Supported

- Common Core State Standards (CCSS)
- Next Generation Science Standards (NGSS)
- C3 Framework for Social Studies State Standards (C3)

**See each lesson for the specific standard covered.**



Looking for a fun way to test your student's recall? Each story in this issue of Explorer has an accompanying Kahoot! quiz.

Log in at **ExplorMag.org**  
to access additional resources including:

- Interactive Digital Magazine with videos and activities
- Projectable PDF for whole class instruction

## 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.

## MINDSET OF AN EXPLORER: KEY FOCUS AREAS

### Attitudes



**CURIOSITY** An explorer remains curious about how the world works throughout his or her life. An explorer is adventurous, seeking out new and challenging experiences.

**RESPONSIBILITY** An explorer has concern for the welfare of other people, cultural resources, and the natural world. An explorer is respectful, considers multiple perspectives, and honors others regardless of differences.

**EMPOWERMENT** An explorer acts on curiosity, respect, responsibility, and adventurousness and persists in the face of challenges.

### Skills



**OBSERVATION** An explorer notices and documents the world around her or him and is able to make sense of those observations.

**COMMUNICATION** An explorer is a storyteller, communicating experiences and ideas effectively through language and media. An explorer has literacy skills, interpreting and creating new understanding from spoken language, writing, and a wide variety of visual and audio media.

**COLLABORATION** An explorer works effectively with others to achieve goals.

**PROBLEM SOLVING** An explorer is able to generate, evaluate, and implement solutions to problems. An explorer is a capable decisionmaker—able to identify alternatives and weigh trade-offs to make a well-reasoned decision.

### Knowledge



**THE HUMAN JOURNEY** An explorer understands where we came from, how we live today, and where we may find ourselves tomorrow.

**OUR CHANGING PLANET** An explorer understands the amazing, intricate, and interconnected systems of the changing planet we live on.

**WILDLIFE AND WILD PLACES** An explorer reveals, celebrates, and helps to protect the amazing and diverse creatures we share our world with.

# LANGUAGE ARTS Use Images and Text to Make Meaning

## Standards Supported

• **CCSS Reading Informational Text:** Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. (4-7)

## What You'll Need

- “The Galápagos Islands” (Explorer, pages 2–3)
- “Islands Born of Fire” (Explorer, pages 4–9)
- Think Sheet (Teacher’s Guide, page 5)
- Clipboards • Pencils

### CONNECT & ENGAGE (20 minutes)

Kids are in a group with you in front of them. Hold up pages 2–3 in the magazine.

**TEACHER TIP:** Use the first two pages of Explorer for Connect & Engage. This will set the stage for the remaining articles in the magazine. The rest of this Language Arts lesson will focus on the article “Islands Born of Fire.”

**Say:** *Today we are going to be reading about the Galápagos Islands. We are going to use the pictures, maps, and diagrams to help us understand more about these unique and interesting islands. To get us started, I’m going to read aloud the text on page 3. It’s an introduction from the managing editor of the magazine.*

Read aloud the text on page 3.

**Say:** *Now take a look at the map of the islands on pages 2–3. Can anyone remind us what kind of information a map can give us?*

Kids should share that a map can provide us lots of information about a place, such as location, shape of the land, and in this case the names of the various islands.

**Say:** *Take some time to look carefully at the map, and then turn and talk about what you notice.*

Kids turn and talk about the map. They should mention things such as the number of islands on the map, the different sizes and shapes of the islands, the names in both Spanish and English, and where the islands are located. They may also mention the map scale and the compass rose, which give information that helps us understand position and scale on the map.

### MODEL (10 minutes)

Kids remain in a group with you in front of them.

**Say:** *Before we move on, did you notice the small world map in the upper corner of the map of the islands? What did that help you do?*

Kids should note that the locator map shows exactly where in the world the islands are.

**Say:** *A map like this is sometimes called a locator map. It helps you find exactly where a place is located in the world.*

**Say:** *I’m going to read the first paragraph on page 4. It tells how to find the islands. As I’m reading, look at the locator map on page 3 as well as the big map of the islands on pages 2–3.*

Read aloud the first paragraph on page 4.

**Say:** *Do you feel like you know where the islands are now? How does having a map to look at help you understand? How did the text also help? Turn and talk about that.*

Kids turn and talk.

**Say:** *This is important stuff to keep track of, if we want to use everything in the article to help us make meaning out of what we are viewing and reading. I’m going to use this Think Sheet chart to write down how the map and the text help me understand.*

Show kids the three-column Think Sheet chart. In the Image column, write “map”; in the Text column, write “first paragraph on page 4”; and in the How They Help Me Understand column, write “They help me figure out where the islands are located.”

## LANGUAGE ARTS Use Images and Text to Make Meaning

### GUIDE (10 minutes)

Hand out Think Sheets and have kids attach them to their clipboards. Kids remain in a group with you in front of them.

**Say:** *I'm going to read aloud the rest of the text on pages 4–5. Then we'll look at the images together.*

Read aloud the text on pages 4–5.

**Say:** *Okay, the text tells us how a hot spot, volcanoes, and tectonic plates were involved in the formation of the islands. The diagrams and photos on these pages help us view more about this process. Let's take a closer look at those images.*

Look at and talk through each of the images in the diagram. Read the captions and check to see if kids have questions about what they are viewing. Then look at the photos and caption on the pages. Make sure kids know that the diagram has illustrations of the process, and the photos are real images of some parts of the islands.

**Say:** *Now turn and talk about the text and the images with your partner and write your thoughts on your Think Sheet.*

Kids should write something like the following on their Think Sheet for the diagram and the text on pages 4–5.

**Image:** diagram at the bottom of pages 4–5

**Text:** information about hot spot, volcanoes, and tectonic plates

**How They Help Me Understand:** I can read and see how the islands formed and moved.

### COLLABORATE (25 minutes)

**TEACHER TIP:** There are several more pages to read in the article. Have kids partner up to work together to read the rest of the article. Some partners may need more assistance than others. Walk around the room to gauge how each pair is doing, and offer help as needed.

**Say:** *Now it's time for you to read with a partner. Go through the rest of the article together, using the images and text to make meaning. As you are viewing and reading, stop to write down your thoughts about*

*the text and the images on your Think Sheet. And don't forget to write how they help you understand.*

Partners read the rest of the article together, stopping to write their thoughts on the Think Sheet. Move around the room, conferring with partners.

**For pages 6–7:** From the text, make sure kids understand ways in which the islands are unique from one another. They should also note the biodiversity on the islands and how and why that happened. The images show a few examples of life on the islands.

**For pages 8–9:** On these pages, both the text and the diagram help kids understand the currents and upwelling in this area, as well as how they are connected to the abundance of wildlife on the islands.

### SHARE THE LEARNING (10 minutes)

Kids join a sharing circle with you and share out, using respectful language.

**Say:** *Okay, now it's time to share your new learning. Choose an example from your Think Sheet to share how images and text helped you understand. I am going to invite [student name] to share. We are going to share using respectful language. So when I ask: "[student name] would you like to share your new learning?" You can say: "Yes, thank you." Then you can share your example. After you share, you can invite someone else to share. To do that, you need to call on the person by name and use the same language we just practiced. When we use polite, respectful sharing language, everyone pays closer attention to the important information being shared.*

Kids share out and invite others to share, always using the respectful sharing language that was modeled. There should be time for about 3 or 4 kids to share out with the whole group. Once they are finished, have everyone turn and share with the person next to them, so that all have a chance to be heard.

*We learned so much today about using the text and many different kinds of images, such as maps, diagrams, and photos to help us understand and make meaning as we read. What a great job you all did!*

**THINK SHEET**

Write the nonfiction features and their purpose.

IMAGE	TEXT	HOW THEY HELP ME UNDERSTAND

## LESSON FRAME Use Images and Text to Make Meaning

### What You'll Need

- Nonfiction text
- Think Sheet template
- Clipboards and pencils

This frame is a kind of template of the lesson we just worked on. It has the instructional moves and language of the lesson, but the specific content has been removed. This way you can use the Lesson Frame for the other articles in the issue or for any nonfiction text you might be teaching.

### CONNECT & ENGAGE (5 minutes)

Kids are in a group with you in front of them. Hold up the article.

**Say:** *Today we are going to be reading about \_\_\_\_\_. We are going to use the images and the text to help us understand more about \_\_\_\_\_. To get us started, I'm going to read aloud the text on page \_\_\_\_.*

Read aloud the text on page \_\_\_\_.

**Say:** *Now take a look at the image(s) [could be photo, map, diagram, etc.].*

**Say:** *Take some time to look carefully at the image(s), and then turn and talk about what you notice.*

Kids turn and talk about what they notice.

### MODEL (10 minutes)

Kids remain in a group with you in front of them.

**Say:** *Now I'm going to continue reading aloud. Listen as I read, and look at the image(s) on the page(s).*

Read aloud page(s) \_\_\_\_\_.

**Say:** *What did you notice about the image(s), and how did that help you understand what you were hearing as I read the text? Turn and talk about that with a partner.*

Kids turn and talk.

**Say:** *This is important stuff to keep track of, if we want to use everything in the article to help us make meaning out of what we are viewing and reading. I'm going to use this Think Sheet chart to write down how the image(s) and the text help me understand.*

Show kids the three-column Think Sheet chart. Write your thoughts in the Image column, the Text column, and the How They Help Me Understand column. Think aloud as you are writing to model for kids how you used the image(s) and text to help you understand and make meaning.

### GUIDE (10 minutes)

Hand out Think Sheets and have kids attach them to their clipboards. Kids remain in a group with you in front of them.

**Say:** *I'm going to continue to read aloud. Then we'll look at the image(s) on the page(s) together.*

Read the text aloud on page(s) \_\_\_\_\_.

**Say:** *Okay, the text tells us \_\_\_\_\_, and the image(s) show more about \_\_\_\_\_. Let's take a closer look.*

Look at and talk through the image(s). Read any captions and check to see if anyone has questions about what they are viewing.

**Say:** *Now turn and talk about the text and the image(s) with your partner and write your thoughts on your Think Sheet.*

**LESSON FRAME** Use Images and Text to Make Meaning**COLLABORATE (25 Minutes)**

**Say:** *Now it's time for you to read with a partner. Go through the rest of the article together, using the images and text to make meaning. As you are viewing and reading, stop to write down your thoughts about the text and the images on your Think Sheet. And don't forget to write how they help you understand.*

Partners read the rest of the article together, stopping to write their thoughts on the Think Sheet. Move around the room, conferring with partners.

**SHARE THE LEARNING (10 minutes)**

Kids join a sharing circle with you and share out, using respectful language.

**Say:** *Okay, now it's time to share your new learning. Choose an example from your Think Sheet to share how images and text helped you understand. I am going to invite [student name] to share. We are going to share using respectful language. So when I ask: "[student name] would you like to share your new learning?" You can say: "Yes thank you." Then you can share your example. After you share, you can invite someone else to share. To do that, you need to call on the person by name and use the same language we just practiced. When we use polite, respectful sharing language, everyone pays closer attention to the important information being shared.*

Kids share out and invite others to share, always using the respectful sharing language that was modeled. There should be time for about 3 or 4 kids to share out with the whole group. Once they are finished, have everyone turn and share with the person next to them, so that all have a chance to be heard.

**Say:** *We learned so much today about using the text and different kinds of images to help us understand and make meaning as we read. What a great job you all did!*

# Introduction/Islands Born of Fire

## SCIENCE

### Standards Supported

- **NGSS ESS2.B: Plate Tectonics and Large-Scale System Interactions:** The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents and near their edges. Maps can help locate the different land and water features of Earth (4-ESS2-2)
- **NGSS ESS2.A: Earth Materials and Systems:** Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)

### Resources

- Projectable PDF or interactive digital magazine
- Plates in Motion poster (Teacher's edition)
- Test the Science: Volcanic Science poster (Teacher's edition)
- Content Assessment Master (page 9)
- Article Test (page 14)

### Science Background

The Galapagos Islands is a group of 19 islands and more than 100 islets and rocks about 1,000 kilometers (620 miles) off the coast of Ecuador. The islands formed over a hot spot on the Nazca tectonic plate. As the plate moves, the islands do, too, getting about 7 centimeters (2.7 inches) closer to South America each year.



Click here for the Kahoot! quiz:  
<https://play.kahoot.it/#/k/716fafeb-c606-4d95-9c2a-6ffa8e1de01b>

### ENGAGE

Encourage students to flip through the **Introduction** and the article and turn and talk with a partner to discuss what they see. Invite students to ask questions or share what they already know about the Galápagos Islands.

### EXPLORE

Display the projectable PDF or the interactive digital magazine. Instruct students to read the text and examine the map. Point out the location of the Galápagos Islands on the world map. As a class, brainstorm ideas about how these islands came to be. Then have students read the **"Islands Born of Fire" article** with a partner or on their own.

### EXPLAIN

After reading, remind students that the title of the article is "Islands Born of Fire." **Ask:** *Why is that an appropriate name for an article about the Galápagos Islands?* (The Galápagos Islands formed over a hot spot in Earth's crust where a column of hot magma rises.) Have students turn and talk as they review details about how the islands formed, why they move, and how the erosion causes the islands to change over time. Challenge students to explain the important roles of wind and ocean currents in the islands' biodiversity. Then have students identify different ways plants and animals made their way to the Galápagos Islands long ago.

### ELABORATE

Display and review the **Plates in Motion poster**. Have students find the Nazca Plate and identify the four other tectonic plates that cause it to move, resulting in a chain of Galápagos Islands. Then display the **Test the Science: Volcanic Science poster**. Provide supplies and have students conduct the experiment with a partner. Rejoin as a class to analyze the results.

### EVALUATE

Have students complete the **Content Assessment** for this lesson. Then have them take the **Article Test**. Encourage them to share and compare their results in small groups.

**CONTENT ASSESSMENT: Introduction/Islands Born of Fire**

Explain how the Galápagos Islands formed. Tell why more plants and animals live on older islands than younger ones.

How	Why

Write a "T" for each statement that is true and an "F" for each one that is false.

- \_\_\_\_\_ It took about 100,000 years for the Galápagos Islands to form.
- \_\_\_\_\_ The Galápagos Islands lie on the North American tectonic plate.
- \_\_\_\_\_ Española was the first Galápagos Island to form.
- \_\_\_\_\_ Most plants and animals on the islands today traveled from South America long ago.
- \_\_\_\_\_ In a million years, there will be more Galápagos Islands than there are now.

Pick one ocean current that flows toward the Galápagos Islands. Describe how that current influences the area's climate and the plants and animals that live there.

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# Home Only Here/Unwanted Guests

## SCIENCE

### Standards Supported

- **NGSS LS1.A: Structure and Function:** Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)
- **NGSS LS2.A: Interdependent Relationships in Ecosystems:** Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)

### Resources

- Projectable PDF or interactive digital magazine
- Content Assessment Master (page 11)
- Article Test (page 15)

### Science Background

One unique aspect of the Galápagos Islands is the number of different plant and animal species that live there. Many are endemic to the Galápagos, meaning they are found nowhere else in the world.

Other animals have been introduced by people, either on purpose or by accident. Some introduced species, like the goat, turn into invasive species. Over time, they become so prevalent that they make it impossible for native species to survive. To protect native species and the overall ecosystem, goats and other invasive species have been removed from the islands.

### ENGAGE

Encourage students to flip through the articles and turn and talk with a partner to discuss what they see. Invite students to ask questions or share what they already know about plants and animals that live on the Galápagos Islands.

### EXPLORE

Display the projectable PDF or the interactive digital magazine. Point out the article headline. Brainstorm ideas about what "Home Only Here" means and how it relates to the Galápagos Islands. Then have students read the **"Home Only Here" article**.

### EXPLAIN

After reading, remind students that many of the species found on Galápagos are endemic to the islands. Discuss what that means. (found only here)

**Ask:** *Why are there so many endemic species on the Galápagos Islands?* (The islands are very isolated.)

Point out that the plants and animals that live here have evolved over time so they could survive. Have students turn and talk as they discuss adaptations that help Galápagos penguins survive (lean forward to shade their feet; stretch flippers to release body heat; ADVENTURER edition only, tuck eggs in cool, rocky crevices). Then have students identify adaptations that help marine iguanas survive. Invite students to share what they know about other endemic species that live on the Galápagos Islands.

### ELABORATE

Have students read the **"Unwanted Guests" article** in their student magazines. After reading, have them examine the difference between endemic, introduced, and native species with a partner. Then have them to explore how an introduced species can become invasive. As a class, discuss reasons why it is important for people to monitor and manage all species that live on the Galápagos Islands.

### EVALUATE

Have students complete the **Content Assessment** for this lesson. Then have them take the **Article Test**. Encourage them to share and compare their results in small groups.



Click here for the Kahoot! quiz:  
<https://play.kahoot.it/#/k/716fafeb-c606-4d95-9c2a-6ffa8e1de01b>

## CONTENT ASSESSMENT: Home Only Here/Unwanted Guests

Define each term. Give an example of each that is found on the Galápagos Islands. Identify adaptations that help each plant or animal survive here.

	Definition	Example	Adaptations
native species			
endemic species			
introduced species			
invasive species			

How can introducing new species to the Galápagos Islands damage the balance of the ecosystem? Give examples.

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# Darwin/Land of Giants

## SCIENCE

### Standards Supported

- **NGSS ETS1.B: Developing Possible Solutions:** Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)
- **NGSS ESS3.C: Human Impacts on Earth Systems:** Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)

### Resources

- Projectable PDF or interactive digital magazine
- Content Assessment Master (page 13)
- Article Test (page 16)

### Science Background

Charles Darwin, an English naturalist, arrived in the Galápagos Islands in 1835. Traveling aboard the HMS *Beagle*, he was taking part in a five-year journey to study plants and animals along the South American coast.

On the Galápagos, Darwin found a world unlike any he had ever seen. There were giant tortoises, penguins living at the Equator, and birds with beaks of all shapes and sizes. Darwin collected samples for five weeks, taking notes and keeping a journal to record where each item was collected.

Only later did Darwin recognize how significant the differences in his samples were. Species on each island had evolved to develop traits that allowed them to survive where they lived. Darwin used his ideas to develop the theory of evolution, which he wrote about in his groundbreaking book, *On the Origin of Species*.



Click here for the Kahoot! quiz:  
<https://play.kahoot.it/#/k/716fafeb-c606-4d95-9c2a-6ffa8e1de01b>

### ENGAGE

Encourage students to flip through the "**Darwin**" **article** and turn and talk with a partner to discuss what they see. Invite students to ask questions or share what they already know about Charles Darwin.

### EXPLORE

Display the projectable PDF or the interactive digital magazine. Have students examine the headline and illustration for clues (i.e., ship, clothing, etc.) about who Darwin was and how, when, and why he went to the Galápagos Islands. Then have students read the "**Darwin**" **article**.

### EXPLAIN

After reading, invite students to share what they learned about Charles Darwin. **Ask:** *What did Darwin discover as he began collecting samples on different islands? (The species on each island were unique.)* Have students turn and talk to discuss how finches, in particular, helped Darwin with his studies. (Their beaks were suited for how they got food on each island.) **Ask:** *What did Darwin eventually realize? (The plants and animals had adapted over time to survive the conditions on each island.)* Encourage students to summarize how Darwin's thinking contributed to significant changes in how people saw the natural world.

### ELABORATE

Have read the "**Land of Giants**" **article**, which begins on pages 20-21 in their student magazines. Then have students turn and talk to discuss how people have both harmed and helped giant tortoises on the Galápagos Islands. Encourage them to discuss how reading the other articles in this issue made them feel about the Galápagos Islands. **Ask:** *Do you think it's important to protect the Galápagos Islands?* Invite students to share their opinions.

### EVALUATE

Have students complete the **Content Assessment** for this lesson. Then have them take the **Article Test**. Encourage them to share and compare their results in small groups.

Name \_\_\_\_\_

Date \_\_\_\_\_

## CONTENT ASSESSMENT: Darwin/Land of Giants

Charles Darwin wrote and drew in a journal when he went to the Galápagos Islands. Create a journal entry, from his perspective, about a giant tortoise.

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Imagine that Charles Darwin were alive today. Write another entry in which he reacts to how people have harmed—and are now trying to help—the giant tortoises on Galápagos.

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**ARTICLE TEST: Introduction/Islands Born of Fire**

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

1. Where do the Galápagos Islands form?  
Ⓐ in a supervolcano  
Ⓑ over a hotspot  
Ⓒ under a tectonic plate
  
2. Why do the Galápagos Islands move?  
Ⓐ They are floating on the ocean.  
Ⓑ Lava pushes them across the sea.  
Ⓒ The tectonic plate they lie on moves.
  
3. What works together to create an effect called upwelling?  
Ⓐ wind and ocean currents.  
Ⓑ climate and clouds  
Ⓒ rocks and sediments
  
4. Where did most of the plants and animals on Galápagos Islands come from?  
Ⓐ North America  
Ⓑ South America  
Ⓒ Asia

5. What are two clues that help you identify an older Galápagos Island?

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**ARTICLE TEST: Home Only Here/Unwanted Guests**

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

1. Why are there so many endemic species on the Galápagos Islands?  
Ⓐ The islands are large.  
Ⓑ The islands are near the Equator.  
Ⓒ The islands are very isolated.
  
2. Why are there penguins on the Galápagos Islands?  
Ⓐ People brought them.  
Ⓑ The penguins floated to the islands on logs.  
Ⓒ The penguins were carried here by the Humboldt current.
  
3. How does sneezing help marine iguanas survive on the Galápagos Islands?  
Ⓐ It helps them stay cool.  
Ⓑ It helps them get rid of salt.  
Ⓒ It helps them regulate their body temperature.
  
4. What is true of all introduced species?  
Ⓐ They were brought to a new location on purpose.  
Ⓑ They were brought to a new location through human activity.  
Ⓒ They are all invasive species.
  
5. Why were goats a threat to the Galápagos Islands? How did people solve the problem?

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**ARTICLE TEST: Darwin/Land of Giants**

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

1. Why did Charles Darwin go to the Galápagos Islands?  
 Ⓐ because he knew he would find giant tortoises there  
 Ⓑ to collect and study animal, plant, and rock samples  
 Ⓒ to investigate how the islands formed
  
2. What did he notice about birds on different islands?  
 Ⓐ Their calls had different sounds.  
 Ⓑ Their feathers had different colors.  
 Ⓒ Their beaks had different shapes.
  
3. What did these differences help the birds do?  
 Ⓐ build different kinds of nests  
 Ⓑ eat different kinds of food  
 Ⓒ attract mates in different ways
  
4. What is Darwin's idea that species change over time called?  
 Ⓐ natural selection  
 Ⓑ theory of evolution  
 Ⓒ traits and behaviors
  
5. What is the most interesting thing you learned about Darwin and the Galápagos Islands?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Pathfinder and Adventurer

## ANSWER KEY

### Introduction/Islands Born of Fire

#### Assess Content, page 10

**How:** The Galapagos Islands lie on the Nazca tectonic plate and rest above a hot spot. An island forms over the hot spot. As the plate moves, it pushes the first island east. A second island forms over the hot spot. As a third island forms, the first island begins to erode.

**Why:** Erosion has had more time to break rock down into fertile soil on older islands. Trees and other plants have had more time to grow there, creating good places for animals to live over a longer period of time.

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

Answers will vary depending on which current students select. Information in responses should come from the article.

#### Article Test, page 15

1. B; 2. C; 3. A; 4. B; 5. Possible response: Older islands have more plants and animals and they are farther east from the hot spot.

### Home Only Here/Unwanted Guests

#### Assess Content, page 12

**native species:** a species that normally lives and thrives in a particular ecosystem

**endemic species:** a plant or animal that lives only in a particular location

**introduced species:** a species that is not native to a place and has been transported to the new location by human activity

**invasive species:** a species that is introduced to a new environment and typically causes damage to its new ecosystem

Examples and adaptations will vary, but information should come from the article.

**Explain:** Outside organisms put plants and animals that evolved in isolation at risk of competition, disease, or even attack. They can crowd out or destroy the land so native and endemic species can no longer survive there.

#### Article Test, page 16

1. C; 2. C; 3. B; 4. B; 5. Possible response: Goats were introduced by humans and, over time, ate their way through large patches of land. They ate the same thing as the tortoises, caused erosion, and threatened the survival of rare plants and trees. People solved the problem by killing the goats to protect the islands.

### Darwin/Land of Giants

#### Assess Content, page 14

Students should write two journal entries from Charles Darwin's perspective. Content may vary, but each entry should contain a written observation and a drawing depicting what Darwin saw.

#### Article Test, page 17

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