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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

**Pioneer**
Islands Born of Fire .......................................... 510
Home Only Here/Unwanted Guests ........... 530/490
Darwin/Land of Giants ............................... 550/520

**Trailblazer**
Islands Born of Fire .......................................... 640
Home Only Here/Unwanted Guests ........... 700/690
Darwin/Land of Giants ............................... 680/690

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.

Log in at ExplorerMag.org to access additional resources including:
- Interactive Digital Magazine with videos and activities
- Projectable PDF for whole class instruction
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**

**Second Grade Standard Supported**
- **CCSS Reading Informational Text:** Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text. (2-7)

**Third Grade Standard Supported**
- **CCSS Reading Informational Text:** Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur). (3-7)

**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 on the floor in front of you. Sit on a chair and 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.

**MODEL (10 minutes)**

Kids sit in a group on the floor, with you in a low chair 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.”
GUIDE (10 minutes)

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

**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.

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!
Write the nonfiction features and their purpose.

<table>
<thead>
<tr>
<th>IMAGE</th>
<th>TEXT</th>
<th>HOW THEY HELP ME UNDERSTAND</th>
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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 on the floor in front of you. Sit on a low chair and 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 sit in a group on the floor, with you in a low chair 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 in front of you on the floor.

**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.
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!
Science Background

The Galapagos Islands, a group of 19 islands and more than 100 islets and rocks, lies about 1,000 kilometers (620 miles) off the coast of Ecuador.

Each of the islands formed over a hot spot in Earth’s crust. But as the Nazca tectonic plate, where they are located, moves, the islands do, too. In fact, the Galapagos Islands move about 7 centimeters (2.7 inches) closer to South America each year.

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. Have students read the text and examine the map. Then point out the location of the Galápagos Islands on the world map. Guide students to understand how remote these islands are. 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: What kind of fire could create islands like the Galápagos? (Possible response: a volcano) Say: In this case, the Galapagos Islands actually formed over a hot spot. Discuss what a hot spot is and then have students turn and talk as they review details about how the islands formed and why they move. Challenge students to explain how wind and ocean currents impact the islands. Then have students discuss how the islands came to have some of the greatest biodiversity in the world.

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.

Standards Supported

- **NGSS ESS1.C: The History of Planet Earth:** Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1)
- **NGSS ESS2.D: Weather and Climate:** Climate describes a range of an area’s typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)

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 10)
- Article Test (page 15)
CONTENT ASSESSMENT: Introduction/Islands Born of Fire

Draw a diagram that shows how the Galápagos Islands formed and why they move. Label each step of the process.

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<th>Draw</th>
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<table>
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<tr>
<th>Label</th>
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</table>

Answer each question.

1. How do older islands in the Galápagos look different from younger islands? Why?

   
   
   
   

2. How do wind and ocean currents affect the Galápagos Islands?

   
   
   
   

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Home Only Here/Unwanted Guests

SCIENCE

Standards Supported

- **NGSS LS4.D: Biodiversity and Humans:** There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)
- **NGSS LS4.C: Adaptation:** For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3)

Resources

- Projectable PDF or interactive digital magazine
- Content Assessment Master (page 12)
- Article Test (page 16)

**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)

Guide students to recognize that the reason the Galápagos Islands have so many endemic species is because they are so isolated. Then point out that the plants and animals that live here have changed 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 cool body). 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 watch and control 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.
CONTENT ASSESSMENT: Home Only Here/Unwanted Guests

Identify one example for each type of species that lives on the Galápagos Islands. Write two facts you learned about each one.

<table>
<thead>
<tr>
<th>Species Type</th>
<th>Example</th>
<th>Facts</th>
</tr>
</thead>
<tbody>
<tr>
<td>native species</td>
<td></td>
<td></td>
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<tr>
<td>endemic species</td>
<td></td>
<td></td>
</tr>
<tr>
<td>introduced species</td>
<td></td>
<td></td>
</tr>
<tr>
<td>invasive species</td>
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</table>

Why do people want to protect native species on the Galápagos Islands? Why do they want to get rid of invasive species?
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*.

**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 different.) Have students turn and talk to discuss how finches, in particular, helped Darwin with his studies. (Their beaks all had different shapes that helped them get different types of food.) Ask: What did Darwin begin to understand? (The plants and animals on Galápagos had slowly adapted to survive conditions on each island.) Encourage students to summarize how Darwin’s thinking helped to change 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 stories 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.
CONTENT ASSESSMENT: Darwin/Land of Giants

Draw a picture of a giant tortoise. Write a journal entry, like Charles Darwin would have, when he saw the giant tortoise on the Galápagos Islands.

What did he discover about the plants and animals in the Galápagos Islands?

What did Charles Darwin learn after seeing giant tortoises that lived on different islands?

What did he discover about the plants and animals in the Galápagos Islands?

How have people harmed giant tortoises on the Galápagos? How are they trying to help them now?
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. Which continent is closest to the Galápagos Islands?
   A North America
   B South America
   C Asia

2. What did the Galápagos Islands form over?
   A a coral reef
   B an underwater mountain
   C a hot spot

3. Why do they move?
   A Tectonic plates move them.
   B Wind pushes them.
   C Water makes them float.

4. What does upwelling do?
   A Make ocean water hot.
   B Move winds in opposite directions.
   C Bring food to the surface.

5. What are two ways plants or animals may have come to Galápagos long ago?
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
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. What kind of species are found only in one place?
   A) introduced species
   B) invasive species
   C) endemic species

2. What kind of species were brought to Galápagos by people?
   A) endemic species
   B) introduced species
   C) native species

3. Which of these animals was an invasive species on the Galápagos Islands?
   A) marine iguana
   B) red-lipped batfish
   C) goat

4. How have Galápagos penguins adapted to survive on the islands?
   A) They eat native grasses.
   B) They lean forward to stay cool.
   C) They sneeze saltwater.

5. Why are invasive species a threat to the Galápagos Islands?
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. What kind of scientist was Charles Darwin?
   ① chemist
   ② zoologist
   ③ naturalist

2. What did he collect and study?
   ① volcanoes and earthquakes
   ② plants, animals, and rocks
   ③ fossils

3. How were the birds on the islands different?
   ① Their beaks had different shapes.
   ② They built different types of nests.
   ③ Their eggs were different colors.

4. What is the idea behind Darwin’s theory of evolution?
   ① All living things have traits.
   ② Species change over time.
   ③ Behaviors can help living things survive.

5. What is the most interesting thing you learned about Darwin and the Galápagos Islands?

________________________________________________________________________________________________________________________________________
ANSWER KEY

Introduction/Islands Born of Fire

Assess Content, page 10
1. Students should draw and label a diagram similar to the one on pages 4-5 of their student magazines.
2. Older islands are more lush and green than younger ones because they've had more time for plants and animals to grow and live there. Students reading TRAILBLAZER edition may also note that erosion from wind and waves has had more time to break rocks down into fertile soil on older islands.
3. Students may note that long ago wind and ocean currents brought many of the plants and animals that live on the Galapagos Islands today. They may also describe how winds and ocean currents work together to create upwelling, which brings nutrients up from the ocean floor and plays an important role in the area’s climate.

Article Test, page 15
1. B; 2. C; 3. A; 4. C; 5. Possible responses: Some flew. Some floated. Seeds may have stuck to birds’ feathers. Some were carried on driftwood.

Home Only Here/Unwanted Guests

Assess Content, page 12
Examples and facts will vary depending upon which species students choose to write about.
People want to protect native species because many are endemic species to the Galapagos Islands.
People want to get rid of invasive species because they are destroying the ecosystem so native species cannot survive.

Article Test, page 16

Darwin/Land of Giants

Assess Content, page 14
1. Students should draw a picture of a giant tortoise and describe it.
2. Darwin learned that the giant tortoises on each island were different.
3. He discovered that to survive on the islands, the plants and animals had adapted. They had developed traits that helped them survive.
4. People killed many tortoises, causing some species to become extinct. Today, people have created safe places where mother tortoises can lay their eggs. After the eggs hatch, the baby tortoises live and grow here until they are big enough to release into the wild.

Article Test, page 17