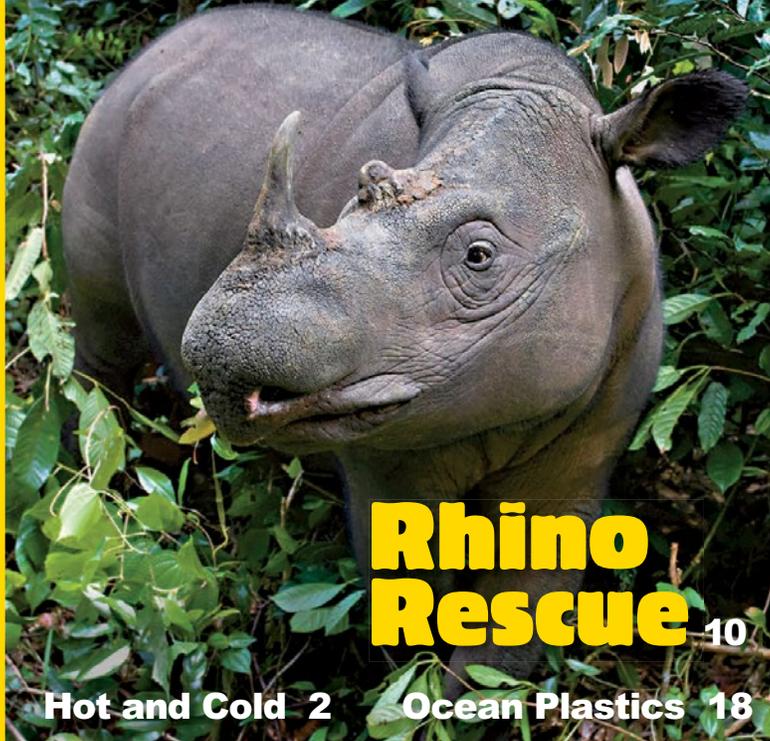




Explorer



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TEACHER'S GUIDE Pathfinder and Adventurer Vol. 19 No. 1

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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

Warm Up, Cool Down..... 670
Rhino Rescue 770
The Problem of Plastics 720

Adventurer

Warm Up, Cool Down..... 790
Rhino Rescue 930
The Problem of Plastics 800

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 one-to-one instruction

National Geographic Learning Framework

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.

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

- “Warm Up, Cool Down” (*Explorer*, pages 2–9)
- Think Sheet (Teacher’s Guide, page 6)

CONNECT & ENGAGE (20 minutes)

Kids are in a group in front of you, either on the floor or at their desks. Hold up pages 2–3 in the magazine.

TEACHER TIP: The focus of this segment needs to be on the teacher’s instruction. However, the whole point of “Connect and Engage” is to get kids fired up, and there will be plenty of interaction throughout this segment and the entire lesson.

Say: *This article, “Warm Up, Cool Down,” is nonfiction. Do you know what nonfiction is? Turn and talk with a partner about what you know about nonfiction.*

Kids turn and talk and share what they know about nonfiction. Make sure kids know that nonfiction is text that gives us true or real information. It includes facts. It is not fiction, or a made-up story.

Say: *Let’s thumb through this article before we start reading. For this lesson, we are going to focus on some of the features of nonfiction. As you browse through the article, what are a few things you notice that are different from a fiction story that is made up? Turn and talk about what you notice.*

Kids turn and talk about the features of the article and then share out with the class. They should mention things such as photos with captions and labels, bold type in the text, and chunks of text under different headings.

MODEL (10 minutes)

Kids sit in a group on the floor or at their desks, with you in front of them.

TEACHER TIP: This segment of the lesson is about the teacher modeling for students. This has to be interactive. Kids should be turning and talking a lot.

Say: *As we talked about, this article is nonfiction, and a lot of nonfiction includes features that can guide our learning. Nonfiction features are things that we saw while browsing through this article. Features like headings, bold text, photos, captions, and labels can help us better understand what we are reading.*

Say: *I am going to read through a bit of this article and show you my thinking. I’m also going to write down my thinking on this two-column chart. Let’s look first at pages 2–3. I’m going to read what’s on the pages.*

Read aloud the title on pages 2–3 and the text on page 3.

Say: *Well, I’m starting to get some information from the title, text, and photos on these pages. The title is letting me know that the article has something to do with warming up and cooling down. Since the photos are showing many different kinds of animals, that is giving me a clue that this article is about animals. The bold word ectotherms in the text is letting me know this is an important word that I’m sure we’ll learn more about as we read on. I’m going to write this down on my chart. I’ll put “title” in the “FEATURE” column and “tells about the article” in the “PURPOSE” column. Under “FEATURE” I’m also going to add “photos” and “bold type.” What is the purpose of these features? Turn and talk about that.*

Kids turn and talk.

Say: *The photos give us information we can see, and bold type emphasizes important words. I'm going to write this information in the "PURPOSE" column.*

Say: *There are so many features in this article. Let's look at a few more. Turn to pages 4–5. See that red text above the chunks of regular black text? Those are called subheads. What do you think their purpose is? Turn and talk about that.*

Kids turn and talk and a few share out.

Say: *Great! Those subheads give us an idea of what each of these sections of text will be about. What other features do you see on these pages?*

Kids share what they think are features.

Say: *Yep! More photos and another bold word. We also have a caption by the lizard photo and another boxed feature that gives us information about the meaning and origin of the words ectotherm and endotherm.*

Say: *Okay, now I need to get the new features and purposes written down on my chart. Help me remember all of them, and I'll write them down.*

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 or at their desks.

Say: *We had a good start with identifying features and purposes, but there are more in this article, and it's your turn to start writing down on your Think Sheet the features and their purposes.*

Turn to pages 6–7 and have kids turn to those pages, too.

Say: *First, turn and talk about some of the features on these pages that we already saw and talked about on the previous pages.*

Kids should notice the subheads, photos, and captions.

Say: *Did you notice any new features?*

Kids share what they think are new features.

Say: *Did you notice the words on a few of the photos, such as "hand" and "lizard"? Those are called labels. Labels are a new feature. What is their purpose?*

Kids should note that labels identify, or name, what is in a photo.

Say: *Something else that is new on these pages is a different kind of photo. This kind of photo is taken with a special camera that shows how much heat an object gives off. There is another feature at the top of a few of those photos. It's a small bar diagram that tells which colors are hotter and which are colder. You are not likely to find this particular feature very often, but for this article it really helps us understand what the photos are showing us and the text is telling us. How cool (and hot) is that?*

Say: *Turn and talk about these new features with the person next to you, and be sure to record the features and purposes on your Think Sheet.*

COLLABORATE (25 minutes)

Say: *Now it's time for you to work with a partner. Go through pages 8–9 and note all of the nonfiction features you find. See if you can name what they are and their purposes. Use your Think Sheet to help you remember. If you run across something new, try to figure out what to call the feature and what its purpose is. Jot down anything new you find on your Think Sheet.*

Say: *If you finish early, look through the other articles in the magazine to find familiar and new nonfiction features.*

Partners work together. Move around the room, conferring with partners. Kids should notice "Wordwise" as a new feature. It is a glossary that gives definitions of the bold words in the article.

SHARE THE LEARNING (10 minutes)

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

TEACHER TIP: The sharing phase is done in a circle, so that the focus is on one another rather than the teacher.

Say: *Okay, flip through the article and consult your Think Sheet and choose a feature and purpose you would like to share. I am going to invite [student name] to share new learning. We are going to share using respectful language. So when I ask: "[student name] would you like to share your new learning?" You need to say: "Yes thank you." Then you can share your learning. After you share, ask if anyone has any comments or questions. Then 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. Also, everyone likes to be listened to when they share out, so remember to pay attention to the person who is sharing.*

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: *You learned so much today about nonfiction features. Turn and talk about how they can help us when we read nonfiction.*

Several kids share out.

Say: *Awesome job, everyone! Don't be surprised if you start seeing these features in all of the nonfiction you read. As you read more nonfiction, you'll start to find that these features will guide you in learning and understanding.*

THINK SHEET

Write the nonfiction features and their purpose.

FEATURE	PURPOSE

LESSON FRAME Notice and Use Nonfiction Features to Guide Learning

When students learn to stop, think, and react to new information, they take the time to think about the text and have a better chance to remember and understand it.

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.

MODEL (10 minutes)

Kids sit in a group on the floor or at their desks, with you in front of them.

Say: *As we talked about, this article is nonfiction, and a lot of nonfiction includes features that can guide our learning. Nonfiction features are things that we saw while browsing through this article. Features like headings, bold text, photos, captions, and labels can help us better understand what we are reading.*

Say: *I am going to read through a bit of this article and show you my thinking. I'm also going to write down my thinking on this two-column chart. Let's look first at pages _____. I'm going to read what's on the pages.*

Read aloud the title on page _____ and the text on page(s) _____.

Say: *Well, I'm starting to get some information from the title, text, and photos on these pages. The title is letting me know that the article has something to do with _____. Since the photo(s) are showing _____, that is giving me a clue that this article is about _____. I'm going to write this down on my chart. I'll put "title" in the "FEATURE" column and "tells about the article" in the "PURPOSE" column. Under "FEATURE" I'm also going to add "photos." What is the purpose of photos? Turn and talk about that.*

Say: *That's it! The photos give us information we can see. I'm going to write this information in the "PURPOSE" column.*

Say: *There are other features in this article. Let's look at a few more. Turn to pages _____. Turn and talk about other features you see.*

Kids turn and talk and a few share out.

Say: *Okay, now I need to get the new features and purposes written down on my chart. Help me remember all of them, and I'll write them down.*

CONNECT & ENGAGE (5 minutes)

Kids are in a group in front of you, either on the floor or at their desks. Hold up the article.

Say: *This article _____ is nonfiction. Do you know what nonfiction is? Turn and talk with a partner about what you know about nonfiction.*

Kids turn and talk and share what they know about nonfiction. Make sure kids know that nonfiction is text that gives us true or real information. It includes facts. It is not fiction, or a made-up story.

Say: *Let's thumb through this article before we start reading. For this lesson, we are going to focus on some of the features of nonfiction. As you browse through the article, what are a few things you notice that are different from a fiction story that is made up? Turn and talk about what you notice.*

Kids turn and talk about the features of the article and then share out with the class. They should mention things such as photos with captions and labels, bold type in the text, and chunks of text under different headings.

LESSON FRAME Notice and Use Nonfiction Features to Guide Learning**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 or at their desks.

Say: *We had a good start with identifying features and purposes, but there are more in this article, and it's your turn to start writing down on your Think Sheet the features and their purposes.*

Turn to pages _____.

Say: *First, turn and talk about some of the features on these pages that we already saw and talked about on the previous pages.*

Kids turn and talk with a partner.

Say: *What new features did you notice?*

Kids share out.

Say: *Now be sure to record these features and purposes on your Think Sheet.*

COLLABORATE (25 Minutes)

Say: *Now it's time for you to work with a partner. Go through pages ____ and note all of the nonfiction features you find. See if you can name what they are and their purposes. Use your Think Sheet to help you remember. If you run across something new, try to figure out what to call the feature and what its purpose is. Jot down anything new you find on your Think Sheet.*

Say: *If you finish early, look through the other articles in the magazine to find familiar as well as new nonfiction features.*

Partners work together. 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, flip through the article and consult your Think Sheet and choose a feature and purpose you would like to share. I am going to invite [student name] to share new learning. We are going to share using respectful language. So when I ask: "[student name] would you like to share your new learning?" You need to say: "Yes thank you." Then you can share your learning. After you share, ask if anyone has any comments or questions. Then 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. Also, everyone likes to be listened to when they share out, so remember to pay attention to the person who is sharing.*

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: *You learned so much today about nonfiction features. Turn and talk about how they can help us when we read nonfiction.*

Several kids share out.

Say: *Awesome job, everyone! Don't be surprised if you start seeing these features in all of the nonfiction you read. As you read more nonfiction, you'll start to find that these features will guide you in learning and understanding.*

Warm Up, Cool Down

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 LS1.C: Organization for Matter and Energy Flow in Organisms:** Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1)

Resources

- Projectable PDF or interactive digital magazine
- Endotherm or Ectotherm poster (Teacher's edition)
- Test the Science: Ectotherms poster (Teacher's edition)
- Content Assessment Master (page 10)
- Article Test (page 15)

Science Background

Most animals need to maintain their body temperature within a fairly narrow range. How they do this depends on the type of animal they are.

Endotherms create their own heat through chemical reactions that take place as their bodies quickly process food. Mammals are endotherms. Many mammals have a hair, fur, or even layers of blubber to help their bodies retain the heat they produce.

Ectotherms, on the other hand, get their heat from the environment. Some, like lizards, absorb heat from the sun during the day. As the temperature rises, they hide underground or in shelters to keep from getting too hot. Others, such as bees, huddle together in large groups to make and retain heat.

Although ectotherms are often described as "cold-blooded," that term is misleading. As the animal warms up, its blood does, too.



Click here for the Kahoot! quiz:
<https://play.kahoot.it/#/k/9623fa83-59c2-4dea-8dce-de603b2f30a2>

ENGAGE

Encourage students to flip through 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 how animals respond to changing temperatures.

EXPLORE

Display the projectable PDF or the interactive digital magazine. Invite students to identify animals in the photos and read the headline and deck. Have students brainstorm a list of traits these animals share. Challenge them to use that list to explain what an ectotherm is.

EXPLAIN

After reading, remind students that *ectotherm* and *endotherm* are words that identify how animals heat their bodies. **Ask:** *What is the difference between these two types of animals?* (Ectotherms cannot produce enough heat inside their bodies to maintain a steady, warm temperature. Endotherms can.) Have students turn and talk as they review the article for examples of each type of animal. Challenge them to explain how ectotherms get heat and endotherms create their own. (Ectotherms get heat from the environment, such as when they on a rock to absorb heat from the sun. Endotherms have a fast metabolism. As the food they eat breaks down, chemical reactions produce heat.) Point out to the class that both ectotherms and endotherms must still find ways to avoid getting too hot or too cold. Invite students to find examples of this in the article.

ELABORATE

Display the **Endotherm or Ectotherm poster**. Encourage students to compare and contrast these two types of animals. Then display the **Test the Science: Ectotherms 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. Encourage them to share and compare their results in small groups.

CONTENT ASSESSMENT: Warm Up, Cool Down

Define the terms *endotherm* and *ectotherm*.

Endotherm:

Ectotherm:

Draw and label an example of each.

Animal: _____

Animal: _____

Describe one thing each animal does to help control its body temperature.

Rhino Rescue

SCIENCE

Standards Supported

- **NGSS ETS1.A: Defining and Delimiting Engineering Problems:** Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5 ETS1-1)
- **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 12)
- Article Test (page 16)

Science Background

In the past 20 years, the number of Sumatran rhinos has dropped by more than 70 percent. With fewer than 80 left, it is the most endangered rhino species on Earth.

Sumatran rhinos, which can live 35 to 40 years, are the smallest rhino species. They are also the only rhinos with two horns. In the wild, they live in dense tropical forests in Indonesia. Unfortunately, due to the threat of poaching, it's no longer safe for them to live in this habitat.

Instead, conservationists have been capturing the rhinos and bringing them to sanctuaries across Indonesia. By giving them protection and helping the rhinos breed, they hope to bring this species back from the edge of extinction.



Click here for the Kahoot! quiz:
<https://play.kahoot.it/#/k/170e1ffb-fe2f-4bef-b66d-8273caf4c200>

ENGAGE

Encourage students to flip through 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 rhinos.

EXPLORE

Display the projectable PDF or the interactive digital magazine. Invite students to examine the photo, headline, and deck. Then review the reading comprehension strategy. Brainstorm ideas about problems the Sumatran rhino might be facing and what scientists could do to keep this species from becoming extinct.

EXPLAIN

After reading, point out to students that people are the reason the Sumatran rhino is so close to extinction. **Ask: Why?** (Poachers have killed many of the rhinos for their horns.) Then point out that people are also doing everything they can to protect Sumatran rhinos from disappearing. Have students turn and talk as they discuss what people are doing and how this could help save the species. (They are capturing rhinos and putting them in sanctuaries where they will be safe. They are also helping the rhinos breed so more Sumatran rhinos will be born.) Invite students to share what they learned about Sumatran rhinos. Encourage them to brainstorm a list of other ways people can help save the rhinos.

ELABORATE

Display the "In Captivity" feature to introduce students to the rhinos that live at the Sumatran Rhino Sanctuary. Then display the "Rhino Recovery" feature. Have students find each place on the map where Sumatran rhinos are kept. Point out how far apart they are. Discuss how this isolation poses a challenge for conservationists who are working to save the rhinos from extinction.

EVALUATE

Have students complete the Content Assessment for this lesson. Encourage them to share and compare their results in small groups.

CONTENT ASSESSMENT: Rhino Rescue

Answer each question about Sumatran rhinos.

<p>What is the Sumatran Rhino Rescue?</p>	
<p>Why do Sumatran rhinos need to be rescued?</p>	
<p>What are people doing to save the Sumatran rhino?</p>	

Write five other facts you learned about Sumatran rhinos.

1.	
2.	
3.	
4.	
5.	

The Problem of Plastics

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 14)
- Article Test (page 17)

Science Background

It's not uncommon to see bits of plastic—or huge chunks—floating on the water or littering land along coastlines. As unsettling as that pollution may be for humans out to enjoy a day at the beach, it can be deadly for the birds and other animals that live there.

Each day, about 8 million pieces of plastic pollution find their way into Earth's oceans. Once there, the bits and pieces can take centuries to decompose. The plastic kills marine mammals, turtles, fish, and birds who mistake floating bags for food, get caught in plastic netting, or ingest tiny microplastics as they feed on other marine animals.

That's why marine biologist and National Geographic Explorer Justine Ammendolia spends so much time collecting trash and creating "plastics profiles" of beaches. Through her research, she hopes to find solutions to this ever-growing problem that plagues Earth.



Click here for the Kahoot! quiz:
<https://play.kahoot.it/#/k/7a62c429-73fe-441e-836d-62dab44844e1>

ENGAGE

Encourage students to flip through 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 plastic pollution.

EXPLORE

Display the projectable PDF or the interactive digital magazine. Instruct students to read the headline. The point out that all three pictures show birds. As a class, brainstorm ideas about why an article about plastic would show pictures of birds.

EXPLAIN

After reading, remind students that Justine Ammendolia is a marine biologist who planned to study where seabirds got their food. **Ask:** *Why did she end up studying plastic pollution as well?* (Her first experiment failed, so she decided to study what the birds ate instead. Then she heard that another researcher had learned that parent birds were bringing plastic back for their chicks to eat. She is now searching for a way to solve that problem.) Have students turn and talk as they discuss what Ammendolia does and how it informs her about the problem. **Ask:** *Why does she try so hard to figure out what types of plastic she finds and where it all comes from?* (If she knows this, she will understand how the problem started. That will help her find a solution.) Have students turn and talk to discuss their own experiences with plastic pollution and brainstorm ideas about how they can help solve this ever-growing problem.

ELABORATE

Point out the "Meet Justine Ammendolia!" feature on the back of this month's *Explorer* magazine. Join the live YouTube event on September 26, 2019, to meet Ammendolia and hear about her work. If you miss the livestream event, tune in later to introduce students to this important issue.

EVALUATE

Have students complete the Content Assessment for this lesson. Encourage them to share and compare their results in small groups.

CONTENT ASSESSMENT: The Problem of Plastics

Use the organizer to record information about the article.

Why does marine biologist Justine Ammendolia study bird poop?

How and why does she create a "plastics profile" of polluted beaches?

How and why does she share her data with others?

What are three things you can do to help solve the plastics problem?

ARTICLE TEST: Warm Up, Cool Down

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

- Which of these animals is an ectotherm?
 A squirrel
 B lizard
 C elephant
- Why isn't a spider an endotherm?
 A It has a very fast metabolism.
 B It can't maintain a steady body temperature.
 C Chemical reactions take place in its body.
- What do elephants and fennec foxes have in common?
 A Both use their ears to cool down.
 B Both are ectotherms.
 C Both hibernate in the winter.
- Which of these statements is true?
 A Most endotherms sweat to stay cool.
 B An ectotherm gets warmth from inside its body.
 C All reptiles are ectotherms.

5. How does shivering help keep some animals warm?

ARTICLE TEST: Rhino Rescue

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

1. Why are Sumatran rhinos nearly extinct?
Ⓐ Disease wiped out their populations.
Ⓑ Poachers killed most of them for their horns.
Ⓒ Conservationists catch them in traps.

2. What are people helping the rhinos do in sanctuaries?
Ⓐ find food
Ⓑ make medicine
Ⓒ reproduce

3. Where are Sumatran rhinos found?
Ⓐ Africa
Ⓑ Australia
Ⓒ Indonesia

4. What is special about the Sumatran rhino named Andalas?
Ⓐ He was the first Sumatran rhino born in captivity in more than 112 years.
Ⓑ He was the last Sumatran rhino born in the wild.
Ⓒ He is the only male Sumatran rhino left.

5. Why is isolation the greatest threat to the Sumatran rhinos existence?

ARTICLE TEST: The Problem of Plastics

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

1. What does marine biologist Justine Ammendolia want to learn about birds?
Ⓐ where they live
Ⓑ how they fly
Ⓒ what they eat

2. What did she collect from birds to figure this out?
Ⓐ feathers
Ⓑ poop
Ⓒ eggs

3. Why is she also studying plastic?
Ⓐ She observed plastic on in a bird's nest.
Ⓑ She saw birds sitting on plastic garbage in the ocean.
Ⓒ Another researcher learned parent birds were feeding plastic to their chicks.

4. What does she do to create a "plastic profile" of a beach?
Ⓐ She observes how birds act around plastic.
Ⓑ She collects and classifies plastic garbage.
Ⓒ She inserts microplastics into the sand.

5. Explain how citizen science can help Ammendolia with her project.

Pathfinder and Adventurer

ANSWER KEY

Warm Up, Cool Down

Assess Content, page 10

Endotherm: an animal that produces enough heat inside its body to maintain a steady, warm temperature

Ectotherm: an animal that cannot produce enough heat inside its body to maintain a steady, warm temperature

Drawings will vary but should depict one endotherm and one ectotherm featured in the article.

Answers will vary depending on which animals students drew. Information in student's responses should come from the article.

Article Test, page 15

1. B; 2. B; 3. A; 4. C; 5. Possible response: When animals shiver, their brain signals their muscles to vibrate. This produces heat to warm the body.

Rhino Rescue

Assess Content, page 12

1. The Sumatran Rhino Rescue is a multi-national plan to save the Sumatran rhino from extinction.
2. The Sumatran rhino needs saved because it is the most endangered of all rhinos. People kill the rhinos for their horns. There are only about 80 Sumatran rhinos left in the wild.
3. People are capturing Sumatran rhinos and taking them to sanctuaries. Scientists and wildlife managers are assisting in the reproduction of the rhinos.

Facts will vary but should all come from the article.

Article Test, page 16

1. B; 2. C; 3. C; 4. A; 5. Possible response: Sumatran rhinos are solitary animals and don't live in groups. The places they do live now are far apart. If male and female rhinos can't find each other, they can't reproduce. If they can't reproduce, the species will become extinct.

The Problem of Plastics

Assess Content, page 14

1. Justine Ammendolia studies bird poop so she can analyze what the bird have eaten.
2. To create a "plastics profile" she collects garbage on beaches and the records the type of plastic garbage she finds. She does this to identify the type of plastic on found on each beach and figure out where it came from.
3. She records her data on an app called Marine Debris Tracker. This keeps all of the data in a central place where she can share it with others. Other scientists or citizen scientists can add data of their own. This helps them come up with a better picture of the problem.
4. Answers will vary.

Article Test, page 17

1. C; 2. B; 3. C; 4. B; 5. Possible response: Through citizen science, members of the public or other professional scientists can collect their own data and add it to her database. This will help her get a better picture of the overall problem.