TEACHER'S GUIDE
Pathfinder and Adventurer
Vol. 19 No. 6

IN THIS GUIDE:

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

Who Takes Care of Our Forests? 790
Digging Up History..... 720
Out of the Water, Into the Lab..... 710

Adventurer

Who Takes Care of Our Forests? 920
Digging Up History..... 840
Out of the Water, Into the Lab..... 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.

Kahoot!

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

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PROJECT LEARNING TREE
An initiative of SFI

AWARD-WINNING ENVIRONMENTAL EDUCATION

National Geographic Learning Framework

NATIONAL GEOGRAPHIC Explorer

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 (A)

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 (S)

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 decision maker—able to identify alternatives and weigh trade-offs to make a well-reasoned decision.

Knowledge (K)

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.

NATIONAL GEOGRAPHIC Explorer

Fourth Grade Standard Supported

• **CCSS Reading Informational Text:** Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why. (4-3)

Fifth Grade Standard Supported

• **CCSS Reading Informational Text:** Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text. (5-3)

What You'll Need

- "Who Takes Care of Our Forests?" (*Explorer,* pages 2–9)
- Think Sheet (Teacher's Guide, page 6)
- Clipboards
- Pencils

CONNECT & ENGAGE (20 minutes)

Kids sit in a group with you in front of you. Hold up pages 2–3

Say: *I'm excited to learn more about this topic today. Let's turn and talk about what we think we already know about forests. I'll walk around and listen in to your conversations.*

Kids turn and talk.

Say: *I listened in on some good conversations, and I heard that some of you already know a few things about forests. This can really help as we read. Good readers take the time to consider what they already know about a topic before they read and also while they are reading. That's called making connections—connecting what we already know to new information we are learning. This helps us better understand.*

Say: *Today we are going to learn about some people who take care of our forests.*

Read the title of the article and read the jobs people do to take care of our forests.

MODEL (10 minutes)

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

Say: *I'm going to show you how I make connections and think about what I already know to help me understand what I am reading.*

Say: *I have a two-column chart that I'll use to jot down a few things I already know in the "My Connections" column. Then, after considering my connections, I'll write down how they help me better understand what I'm reading.*

Read aloud pages 4–5, stopping after reading each person's information.

Say: *Let's look first at Ken Price's information. He's a Forest Technician. He says a forest is a renewable resource and what grows there can grow again. My connection to that is that I have several trees in my yard. Every spring, lots of seeds fall from my maple trees. In the summer, I see lots of little maple sprouts all over my lawn. I think that's what is meant by renewable resource. I'm going to write these things on my chart.*

My Connections	How They Help Me Understand
maple trees, seeds, and sprouts in my yard	helps me understand what "renewable resource" means

Say: *Now with Coeli Hoover's information, I made the connection that I already know that trees and plants take in carbon dioxide and release oxygen. Knowing that trees and plants store carbon helps me better understand why Coeli can measure the carbon in them.*

Say: *The next person is Magen Dufurrena. Magen is a Wildland Firefighter. My connection here is that I know that there have been wildfires in California, and I've seen them on the news. I know they can cause a lot of damage. Making this connection helps me understand why Magan has to work quickly and travel by helicopter to reach the fires.*

I'm going to add my connections and understandings about Coeli's and Magan's information to the chart.

My Connections	How They Help Me Understand
Trees and plants take in carbon dioxide.	helps me understand why carbon can be measured in trees and plants
I've seen wildfires on the news and the damage they can do.	helps me understand why Magan has to work quickly and travel by helicopter to reach the fires

Say: *Another way to make connections to better understand is to make connections across or within the text. On pages 2–3, I see that these three people, even though they work different jobs, all care in some way about our forests. I can also connect that to the title of the article, "Who Takes Care of Our Forests?" I understand that these are three people who do.*

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: *You can try this now. I'll read, and you can think about what you already know and the connections you have to the text.*

Read pages 6–7 aloud. You might want to read Cady Lancaster's information and then stop to have kids turn and talk and record their connections. Next, read Darren J.H. Sleep's information and then Ashley Coble's, asking kids to turn and talk and record their connections after each segment.

Say: *Did you have some interesting connections? Who can share a connection with us?*

Let a few kids share their connections with the class.

Say: *Remember, the reason we consider what we already know and make connections with the text is to help us better understand what we are reading. Now take some time to record on your Think Sheets how the connections you made help you better understand. Then turn and talk again about your connections and how they help you understand what we are reading about in the article.*

Kids record on their Think Sheets and turn and talk.

Say: *I said before that another way to make connections is across or within the text. How do these three people connect with the others we read about on pages 4–5?*

Kids should mention that these three people also take care of our forests in the work that they do.

COLLABORATE (25 minutes)

Say: *Now you are ready to work with a partner. You can take turns reading the rest of the article. Write your connections in the first column of your chart. You and your partner will have different connections. You can discuss your different connections. Be sure to also take time to write on your Think Sheet chart how these connections help you understand.*

Say: *I'm going to move around the classroom, so let me know if you need help.*

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 to choose a connection you would like to share. Also share how that connection helped you understand what you were reading. Remember to share using respectful language. After you share, ask if anyone has any comments or questions. Then you can invite someone else to share.*

Kids share out and invite others to share, always using respectful sharing language. There should be time for about 3 or 4 kids to share out with the whole group.

Say: *You've learned that thinking about what you already know and making connections to the text helps you better understand what you are reading. Turn and talk about some of the important connections you made today.*

Kids turn and talk so that all have a chance to share their connections.

Say: *Everyone, you made some wonderful connections today!*

Name _____ Date _____

THINK SHEET

Use this chart to write your connections and how they help you understand.

My Connections	How They Help Me Understand

LESSON FRAME Make Connections to Better Understand

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 sit in a group with you in front of you.

Say: *I'm excited to learn more about this topic today. Let's turn and talk about what we think we already know about _____. I'll walk around and listen in to your conversations.*

Kids turn and talk.

Say: *I listened in on some good conversations, and I heard that some of you already know a few things about _____. This can really help as we read. Good readers take the time to consider what they already know about a topic before they read and also while they are reading. That's called making connections—connecting what we already know to new information we are learning. This helps us better understand.*

MODEL (10 minutes)

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

Say: *I'm going to show you how I make connections and think about what I already know to help me understand what I am reading.*

Say: *I have a two-column chart that I'll use to jot down a few things I already know in the "My Connections" column. Then, after considering my connections, I'll write down how they help me better understand what I'm reading.*

Read aloud page(s) _____.

Say: *Let's look at _____. My connection to that is _____. I'm going to write that on my chart.*

Now I am going to write how my connection helps me understand what I am reading.

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: *You can try this now. I'll read, and you can think about what you already know and the connections you have to the text.*

Read page(s) _____ aloud.

Say: *Did you have some interesting connections? Who can share a connection with us?*

Let a few kids share their connections with the class.

Say: *Remember, the reason we consider what we already know and make connections with the text is to help us better understand what we are reading. Now take some time to record on your Think Sheets how the connections you made help you better understand. Then turn and talk again about your connections and how they help you understand what we are reading about in the article.*

Kids record on their Think Sheets and turn and talk.

COLLABORATE (25 Minutes)

Say: *Now you are ready to work with a partner. You can take turns reading the rest of the article. Write your connections in the first column of your chart. You and your partner will have different connections. You can discuss your different connections. Be sure to also take time to write on your Think Sheet chart how these connections help you understand.*

I'm going to move around the classroom, so let me know if you need help.

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 to choose a connection you would like to share. Also share how that connection helped you understand what you were reading. Remember to share using respectful language. After you share, ask if anyone has any comments or questions. Then you can invite someone else to share.*

Kids share out and invite others to share, always using respectful sharing language. There should be time for about 3 or 4 kids to share out with the whole group.

Say: *You've learned that thinking about what you already know and making connections to the text helps you better understand what you are reading. Turn and talk about some of the important connections you made today.*

Kids turn and talk so that all have a chance to share their connections.

Say: *Everyone, you made some wonderful connections today!*

Who Takes Care of Our Forests?

NATIONAL GEOGRAPHIC Explorer

SCIENCE

Standards Supported

- **NGSS Crosscutting Concepts: Influence of Engineering, Technology, and Science on Society and the Natural World:** Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. (3-5-ETS-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
- Find Your Green Job poster (Teacher's edition
- Content Assessment Master (page 10)
- Article Test (page 15)

Science Background

According to the International Labour Organization, in 2017 there were 9.8 million "green" jobs. By 2030, it is estimated that there will be up to 60 million more.

What are "green" jobs? Simply put, they are jobs that benefit the environment or conserve natural resources. Green jobs can be found in every sector of the economy.

This article, which focuses on green careers in the forestry, was written in conjunction with Project Learning Tree® (PLT), an initiative of the Sustainable Forestry Initiative ® Inc. For more details about PLT and its Green Jobs in Forests curriculum, go to: https://www.plt.org/curriculum/green-jobs-forest-careers/.

Click here for the Kahoot! quiz: https://play.kahoot.it/#/k/9d7c8a45-394a-41b4-bf2d-8cead0f61389

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 forests.

EXPLORE

Display the **"Who Takes Care of Our Forests?" article** with the projectable PDF or the interactive digital magazine. Point out the magazine's cover, which identifies this article as "Green Careers." As a class, discuss what green careers are and why "Green Careers" is also a good title for this article.

EXPLAIN

After reading, remind students that wood is a renewable resource. It can grow back—or be naturally replenished—faster than it is used. **Say:** *But just because it can do this doesn't mean it will. Natural disasters take a toll on forest ecosystems. So do people when they cut trees for logging or clear land so they can use it.* Point out that this is why we need scientists like those featured in the article. **Say:** *Each of these people is doing something to keep our forests healthy so they meet our needs now and are still around for future generations to enjoy and use.* Have students turn and talk to review each segment in the article. Encourage them to discuss what each scientist does and how his or her efforts help conserve renewable resources found in forests.

ELABORATE

Point out to students that the nine jobs featured in the article are just a small sample of the green careers available in forestry. There are, in fact, opportunities for people with a wide range of personalities and interests. Display the "**Find Your Green Job" poster**. Give students time to examine it and see where they fit in. Encourage students to conduct research to learn more about the career they think best suits their personality and interests.

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: Who Takes Care of Our Forests?

Identify four types of scientists from the article. Describe what they do and explain how their work helps conserve Earth's renewable resources.

Identify	Describe	Explain

Use the chart on the "Find Your Green Job" poster to find the green job that best fits your personality. Describe the job. Explain how it helps conserve Earth's renewable resources.

Identify	Describe	Explain

Digging Up History

SOCIAL STUDIES

Standards Supported

- **C3: Historical Sources and Evidence:** Summarize how different kinds of historical sources are used to explain events in the past. (DS.His.9.3-5)

Resources

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

Social Studies Background

George Washington is remembered for many things—most notably, being the first president of the United States. One accomplishment people may not be aware of is his role in creating the fantastic gardens at his Mount Vernon estate.

Although hired workers and enslaved people did the manual labor, Washington designed and oversaw the landscape at Mount Vernon himself. This included four gardens that surrounded a large guitar-shaped lawn, known as a bowling green. A gravel path around the bowling green allowed visitors to wind their way from one garden to another.

Each of the four gardens had a specific purpose. In the lower garden, or the kitchen garden, enslaved people grew fruits and vegetables year round. In the botanical garden, Washington experimented with growing new plants. The fruit garden and nursery was home to plants that required more space.

The highlight for the many guests to visit Mount Vernon was the upper garden, which featured an assortment of flowers and exotic plants from around the world. Washington even built a greenhouse as the focal point of this formal garden. During the cold Virginia winters, it was a safe place to keep tropical plants, which would be planted in the upper garden come spring.

Click here for the Kahoot! quiz:
https://play.kahoot.it/#/k/
ccff12cc-b743-4ffe-9cfd-5e4496fd7b94

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 Mount Vernon.

EXPLORE

Display the **"Digging Up History" article** with the projectable PDF or the interactive digital magazine. As a class, brainstorm a list of ways people could learn about Mount Vernon's past.

EXPLAIN

After reading, remind students that a primary source is a source of information that was created at the time under study. **Say**: *When people study primary sources to learn about the past, they automatically think about history. But science is a big part of the story, too.* Have students turn and talk to discuss how science helped historians unearth the history of George Washington's gardens at his Mount Vernon estate. Encourage them to summarize the methods scientists used and the valuable clues they uncovered. (They dug shallow rectangles in the ground. They studied soil composition and collected pollen and seeds.) **Ask:** *What did these clues reveal?* (They showed what was planted and where Washington's different gardens were located.)

ELABORATE

Remind students that people study primary sources to learn about the past. In this article, they learned how primary sources revealed clues that helped scientists and historians accurately recreate George Washington's gardens. As a class, examine the size, contents, and composition of Washington's gardens as well as his front lawn. Discuss what these clues reveal about Washington himself.

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: Digging Up History

Summarize how each of these primary sources helped experts recreate George Washington's gardens at Mount Vernon.

notes	drawings
soil	**pollen and seeds**

What did studying nature at Mount Vernon reveal about George Washington?

_____

_____

_____

_____

_____

Out of the Water, Into the Lab

NATIONAL GEOGRAPHIC Explorer

SCIENCE

Standards Supported

- **NGSS Science and Engineering Practices: Engaging in Argument from Evidence:** Construct an argument with evidence, data, and/or a model. (4-LS1-1)
- **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
- Sharks! poster (Teacher's edition)
- Content Assessment Master (page 14)
- Article Test (page 17)

Science Background

Oceans, which cover more than 70 percent of Earth's surface, are home to a huge variety of animals. Their waters are also the final resting ground for a wide range of pollutants. Everything from plastics and pesticides to sewage and toxic chemicals is entering our seas. And it's making the animals that live there sick.

National Geographic Explorer and marine biologist Andrej Gajic is studying how all of these pollutants impact sharks and their cousins, skates and rays. In addition to observing live sharks in the water, he examines tissue samples from already-dead sharks that were accidently caught by fishers.

Gajic has discovered diseases in various shark organs and pieces of plastic in their stomachs and intestines. He hope his work helps make people more aware of how their actions affect marine life.

Kahoot!

Click here for the Kahoot! quiz:
https://play.kahoot.it/#/k/
bbd0e9f7-f204-43e4-9413-1b91e28bbf6d

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 sharks.

EXPLORE

Display the **"Out of the Water, Into the Lab" article** with the projectable PDF or the interactive digital magazine. As a class, brainstorm a list of problems sharks might face. Discuss reasons why a scientist would need to study sharks both in the water and in a lab to find answers.

EXPLAIN

After reading, remind students that pollution is causing illnesses in many marine animals—including sharks. **Ask:** *How are people polluting ocean waters?* (They are releasing plastics, pesticides, waste poison, and sewage into the sea.) *How is this pollution making sharks sick?* (It is causing diseases. Sharks that eat plastic suffer from other problems.) Have students turn and talk to discuss how Andrej Gajic is studying this problem—in the water and out—and what he is learning. Then have students brainstorm a list of things they could do to help.

ELABORATE

Display and review the **"Sharks!" poster**. Encourage students to describe the sharks they see. Point out that these sharks live in different parts of the ocean and eat different things. Poll the class to see if students think these differences would cause ocean pollution to affect the sharks in different ways. Challenge volunteers to explain 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: Out of the Water, Into the Lab

Use this organizer to examine Andrej Gajic's work with sharks.

What problem is Andrej Gajic trying to understand?	
Why does he know this is a problem?	
What has he observed in the water?	
What evidence has he collected in the lab?	
What conclusion has he reached?	
What can people do to help him solve the problem?	

Name _____ Date _____

ARTICLE TEST: Who Takes Care of Our Forests?

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

1. Why are forests a renewable resource?
   - Ⓐ They have rocks and soil.
   - Ⓑ What grows there can grow again.
   - Ⓒ They can be plotted and mapped.

2. What kind of specialist can help catch criminals who have been poaching trees?
   - Ⓐ forest technician
   - Ⓑ GIS resource specialist
   - Ⓒ wood scientist

3. What does a hydrologist study?
   - Ⓐ water
   - Ⓑ soil
   - Ⓒ vegetation

4. Why does a carbon modeler measure trees?
   - Ⓐ to identify their "fingerprint"
   - Ⓑ to see how much carbon is stored in the wood
   - Ⓒ to calculate how many new trees need to be planted

5. How does a wood building design consultant help conserve renewable resources?

_____

_____

_____

_____

Name _____ Date _____

ARTICLE TEST: Digging Up History

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

1. How many main gardens did George Washington have?
   - Ⓐ two
   - Ⓑ three
   - Ⓒ four

2. Which primary resource revealed what was planted, when, and where?
   - Ⓐ **articles written about** Washington
   - Ⓑ drawings made by enslaved gardeners
   - Ⓒ photographs of Washington's gardens

3. What did scientists analyze to determine which areas could sustain plant growth?
   - Ⓐ soil fertility
   - Ⓑ indigenous plants
   - Ⓒ the bowling green

4. Why did Washington plant exotic trees in his upper garden?
   - Ⓐ That garden was just for food.
   - Ⓑ He was trying to start a vineyard there.
   - Ⓒ That is where he entertained guests.

5. How was Washington's front lawn a sign that he was a very wealthy landowner?

_____

_____

_____

_____

Name _____ Date _____

ARTICLE TEST: Out of the Water, Into the Lab

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

1. What does Andrej Gajic look for when he dives with sharks?
   - Ⓐ schools of fish
   - Ⓑ signs of disease
   - Ⓒ floating sediment

2. What does he think might be making sharks sick?
   - Ⓐ warming waters
   - Ⓑ more salt in the water
   - Ⓒ pollution

3. Where does he get the sharks he usually studies in the lab?
   - Ⓐ from aquariums
   - Ⓑ from poachers
   - Ⓒ from fishers

4. In which shark body parts has he found plastic?
   - Ⓐ brain and liver
   - Ⓑ stomach and intestines
   - Ⓒ kidney and gills

5. Why should people stop using toothpastes that contain microplastics?

_____

_____

_____

_____

ANSWER KEY

Who Takes Care of Our Forests?

Assess Content, page 10

Part 1: Answers will vary depending on which type of scientists students choose to include. However, information on job descriptions and explanations about how they help conserve Earth's renewable resources should come from the article.

Part 2: Students should select a job from the poster and conduct additional research, if necessary, to describe what the job is and explain how it helps conserve Earth's renewable resources.

Article Test, page 15

1. B; 2. C; 3. A; 4: B; 5. A wood building design consultant helps architects and engineers select the right products for the right job to ensure they are doing it in a sustainable manner.

Digging Up History

Assess Content, page 12

notes: Washington's notes revealed that there were four main gardens: an upper garden filled with flowers, bushes, and exotic trees; a lower garden just for food; a small garden used as a laboratory; and a fruit garden and nursery.

drawings: Both enslaved people and Samuel Vaughan, an English merchant who visited Mount Vernon, created drawings of the gardens that showed what was planted, when, and where.

soil: Scientists analyzed the soil to learn about its fertility, which can explain why Washington grew certain kinds of crops or used certain farming techniques. They also dug long, shallow rectangles to examine the soil and identify where original planting beds were located.

seeds and pollen: They found seeds and pollen. They collected microscopic plant cells to learn what types of plants Washington planted.

Possible response: Studying nature revealed that Washington used his garden for various purposes. It also revealed that he had a lot of time, money, and power. It would have taken many enslaved people to maintain the lawn and garden. And he had enough land that he could spare some for a large front lawn.

Article Test, page 16

1.C; 2. B; 3. A; 4. C; 5: In the 18th century, land was expensive and precious. Most people used land for other purposes, like farming. Washington's large front lawn showed that he had enough land and money to set some aside just for show.

Out of the Water, Into the Lab

Assess Content, page 14

1. He is trying to understand the effects of pollution on sharks and skates and rays.
2. Pollution is causing illnesses in many marine mammals.
3. To the eye, the sharks look healthy.
4. He has studied shark organs, which show signs of illness and disease.
5. Pollution is making the sharks sick.
6. People can stop using toothpastes that contain microplastics, stay away from disposable plastic bags and drinking straws, and participate in citizen science projects. They can also learn as much as possible about sharks.

Article Test, page 17

1. B; 2. C; 3. C; 4: B; 5. Possible response: The microplastics eventually end up in the ocean and inside sharks' stomachs and intestines. This makes the sharks sick.