



Explorer



Extreme Plants 2

Lava Domes 8 Screws 16

TEACHER'S GUIDE Pioneer and Trailblazer Vol. 18 No. 3

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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

Extreme Plants	480
Living with Lava Domes.....	510
Something Screwy Going On	520

Trailblazer

Extreme Plants	590
Living with Lava Domes.....	680
Something Screwy Going On.....	530

Standards Supported

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

For additional resources to extend your students' learning, visit EXPLORER's website:

NATGEO.ORG/EXPLORERMAG-RESOURCES

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

A — Attitudes

National Geographic kids are:

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

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

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

S — Skills

National Geographic kids can:

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

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

COLLABORATE with others to achieve goals.

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

K — Knowledge

National Geographic kids understand:

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

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

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

Second Grade Standard Supported

• **CCSS Reading Informational Text:** Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently. (2–5)

Third Grade Standard Supported

• **CCSS Reading Informational Text:** Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently. (2–5)

What You'll Need

- “Living with Lava Domes” (*Explorer*, pages 8–15)
- Think Sheet (Teacher’s Guide, page 6)
- Clipboards and pencils

CONNECT & ENGAGE (5 minutes)

Kids are in a group on the floor in front of you. Sit on a low chair and hold up pages 8–9 in the magazine.

TEACHER TIP: The reason kids are grouped on the floor is that the focus 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: Take a look at these pictures! What do you notice? Turn to each other and talk.

Kids turn and talk about the large photo and also the photos of the scientists.

Say: The headline of this article is “Living with Lava Domes.” Turn and talk about what you think the headline means.

Kids turn and talk about what the headline might mean, based on the photo and the title. Some may have an idea; others may not.

Say: I think this headline is talking about what we see in that large photo. What’s happening there looks a little scary. I’m guessing that’s a lava dome, and if you live near it, you’d have to learn how to live with it and try to stay safe.

Say: I’m also curious about those pictures of the people. I think they may have something to do with these lava domes. What do you think?

Kids share out their thinking.

Say: Let’s read on and see if we can find some answers.

MODEL (10 minutes)

Kids sit in a group on the floor, with you in a low chair in front of them.

TEACHER TIP: While this segment of the lesson is about the teacher modeling for students, be careful not to go on and on. This has to be interactive. Kids should be turning and talking a lot.

Say: This article is nonfiction, and a lot of nonfiction includes features that can guide our learning. Nonfiction features are things like headlines, subheads, pictures, captions, labels, and diagrams, and we have all of those in this article.

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 8–9 again. I’m going to read what’s on the pages.

Read aloud the text on page 8. Tell students this is sort of a subtitle that tells what the article is about.

Say: Well, we got a lot of information from this feature. This is kind of like a subtitle. A feature like this follows the headline and tells more about the article. I’m going to write that down on my chart. I’ll put “subtitle” in the “FEATURE” column and “tells more about the article” in the “PURPOSE” column. Now let’s look at the people’s pictures and the text under them. Both of these are features, too. (Read the text under the pictures.) What is the purpose of these features? Turn and talk about that.

Say: *That's it! The pictures show us what these scientists look like, and the labels tell us their names and what they do. I'm going to write that in the "PURPOSE" column, but first I'll write "pictures" and "labels" in the "FEATURE" column.*

Say: *There are so many features in this article. Let's look at a few more. Turn to pages 10–11. See that red 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.) Great! Those heads give us an idea of what each of these sections will tell us. What other features do you see on these pages? (Kids share what they think are features.) Yep! More pictures, but this time we have something a little different in those pictures. We have captions in them. And, one of those pictures is actually called a diagram. See those labels in the picture at the top of page 11? They show us exactly where the Santa María volcano is and the four lava domes at its base. (Read the captions and also the labels in the diagram.)*

Say: *Oh, and there are some bold words on page 10. You've probably seen bold words in text before. That's a feature, too. They let us know these words are important and may be new to us.*

Say: *We have something else on page 10 that is a different feature. It's a map. Can anyone tell the purpose of a map? (Kids share out.) Yes. Maps show us the location of a place. In this case, we can see where the lava domes are located.*

Say: *Okay, now I need to get all of these 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.

Say: *We had a good start with identifying features and purposes, but there are so many 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 12–13.

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, the picture, and the caption.

Say: *Did you notice any new features? (Kids share what they think is a new feature.) That illustration, or drawing, on page 12 is something new in this article, isn't it? It's called a cross-section diagram. It's different from the diagram on page 11, because it shows us what is inside an eruption. It even shows us numbered information that let's us know what happens first, next, and so on. Wow! There is a ton of information on this cross-section diagram. This is a hard-working feature!*

Say: *Okay, go ahead and turn and talk about this new feature with the person next to you, and be sure to record this feature and its purpose on your Think Sheet.*

COLLABORATE (25 minutes)

Say: *Now it's time for you to work with a partner. Go through pages 14–15 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 other familiar as well as new nonfiction features.*

Partners work together. Move around the room, conferring with partners. Students 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 _____ to share new learning. We are going to share using respectful language. So when I ask: “_____ 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: Don't be surprised if you start seeing features in all of the nonfiction you read. That's one of the great things about nonfiction. All these features are super helpful. So remember, when you read nonfiction, it is important to notice the nonfiction features to guide your learning. Awesome job, everyone!

Name _____

Date _____

THINK SHEET

Note the features and their purpose as you read.

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.

CONNECT & ENGAGE (5 minutes)

Kids are in a group on the floor in front of you. Sit on a low chair and hold up a few pages in the magazine.

Say: Take a look at these pictures! What do you notice? Turn to each other and talk.

Kids turn and talk about the photos and other features on the pages.

Say: The headline of this article is “_____.” Turn and talk about what you think the title means.

Kids turn and talk about what the headline might mean, based on the photos and the headline. Some may have an idea; others may not.

Say: I think this headline is talking about _____.

Say: I'm also curious _____. What else are you curious about?

Kids share out.

Say: Let's read on and see if we can find some answers.

MODEL (10 minutes)

Kids sit in a group on the floor, with you in a low chair in front of them.

Say: This article is nonfiction, and a lot of nonfiction includes features that can guide our learning. Nonfiction features are things like headlines, subheads, pictures, captions, labels, and diagrams.

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 text. Tell students about the features on the pages.

Say: Well, we got a lot of information from this feature. This is called _____. The purpose of a feature like this is _____. I'm going to write that down on my chart. I'll put "_____" in the "FEATURE" column and "_____" in the "PURPOSE" column. Now let's look at another feature on these pages. (Find another feature.) What is the purpose of this feature? Turn and talk about that.

Say: That's it! I'm going to write that in the "PURPOSE" column, but first I'll write "_____" in the "FEATURE" column.

Say: There are so many features in this article. Let's look at a few more. Turn to pages _____. See that _____? That's called _____. What do you think its purpose is? Turn and talk about that. (Kids turn and talk and a few share out.) Great! That feature helps us by _____. What other features do you see on these pages? (Kids share what they think are features and their purposes.)

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

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.

Say: *We had a good start with identifying features and purposes, but there are so many 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 should notice familiar features that were previously discussed.

Say: *Did you notice any new features? (Kids share what they think are new features.)*

Say: *Okay, go ahead and turn and talk about the new features with the person next to you, and be sure to record the features and their 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 other 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 _____ to share new learning. We are going to share using respectful language. So when I ask: "_____ 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: *Don't be surprised if you start seeing features in all of the nonfiction you read. That's one of the great things about nonfiction. All these features are super helpful. So remember, when you read nonfiction, it is important to notice the nonfiction features to guide your learning. Awesome job, everyone!*

Extreme Plants

SCIENCE

Standards Supported

- **NGSS LS.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 LS3.B: Variation of Traits:** The environment also affects the traits that an organism develops. (3-LS3-2)

Resources

- Content Assessment Master (page 10)
- Article Test (page 17)

Science Background

Plants are living things. Like all living things, they have special parts that help them get what they need to survive. For most plants, these parts include roots, stems, leaves, flowers, fruit, and seeds.

In some plants, these parts have unique adaptations that range from strange to downright deadly. The castor bean plant falls into the latter category. Its seeds contain a poison called ricin. Ricin does its job. It protects the seeds. But just a little bit can be deadly to people or animals.

The Venus flytrap has deadly leaves...at least for insects. The leaves snap shut, trapping small prey inside. The plant then digests its meal. The gympie-gympie tree's leaves aren't deadly, but just brushing up against their fuzzy, needle-like hairs can cause terrible pain.

With the Corpse flower and *rafflesia* plant, it's all about the bloom. Their massive flowers reek like a dumpster. To some pollinators, that scent is irresistible. And when it comes to shoots, it's hard to beat tortoise-shell bamboo. This plant's stalk grows so fast you can actually see it getting bigger.

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 plants that could be identified as extreme.

EXPLORE

Display pages 2-3 of the projectable magazine. Invite students to examine the photo, headline, and text. Challenge students to identify the plant in the photo. (Venus flytrap) Point out that none of the phrases in the text apply to this plant. Brainstorm ideas for a phrase that describes this extreme plant.

EXPLAIN

After reading, remind students that all plants have parts that help them survive where they live.

Ask: *What are some common plant parts?* (Possible responses: seeds, leaves, and flowers) Point out that, in some cases, those parts have adapted in extreme ways. **Ask:** *Which part of the Venus flytrap is extreme?* (leaves) *Why?* (They catch and eat insects.) Have students turn and talk as they discuss how this adaptation helps the plant survive where it lives. (The Venus flytrap lives in poor soil. Its leaves help it get the nutrients it needs to live.) Have students review the article for examples of other extreme parts. Encourage them to discuss how these parts help the plants survive where they live.

ELABORATE

Divide the class into small groups. Instruct groups to conduct research to identify other plants with extreme adaptations. Challenge them to explain how the adaptations help the plants survive.

EVALUATE

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

Name _____

Date _____

CONTENT ASSESSMENT: Extreme Plants

Draw a picture of one plant in the article using its extreme adaptations.



Which plant is it? _____

How do its adaptations help it survive? _____

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Living with Lava Domes

SCIENCE

Standards Supported

- **NGSS ESS1.C: The History of Planet Earth:** Some events happen very quickly; others occur very slowly, over a period of time much longer than one can observe. (2-ESS1-1)
- **NGSS ESS3.B: Natural Hazards:** A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1)

Resources

- Content Assessment Master (page 12)
- Article Test (page 18)

Science Background

In 1902, Guatemala's Santa María volcano had a massive eruption. About 20 years later, the Santiaguito lava-dome complex formed at the volcano's base. And since then, the lava domes here have been erupting nearly every hour. Why? That's what volcanologist Stephanie Grocke wants to find out.

Grocke, photographer Gabby Salazar, and cartographer Ross Donihue undertook a month-long study of the system. Using mapping and time-lapse photography, they hope to discover the system's secret.

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 volcanoes.

EXPLORE

Display pages 8-9 of the projectable magazine. Highlight the headline. **Ask:** *What is a lava dome and why do people need to know how to live with them?* Invite students to share their ideas.

EXPLAIN

After reading, encourage students to use details from the article to understand what a lava dome is. **Ask:** *How do lava domes form?* (Magma erupts from a vent and pours onto Earth's surface. As the lava piles up, it makes a large dome.) Have students turn and talk as they discuss why volcanologist Stephanie Grocke teamed up with a photographer and a cartographer to study this volcanic system. Then have students examine the diagram on page 12 to review what happens when a lava dome erupts. Challenge students to identify ways lava domes can quickly become dangerous during large eruptions. (Ash and volcanic rock combine with water to create a muddy mix that quickly flows down the volcano. Hot clouds of gas, ash, and rock sweep across the land, destroying everything in their path.)

ELABORATE

Remind students that the lava domes featured in the article erupt so often that people living nearby are used to it. Have students turn and talk to discuss how understanding the science behind the lava domes could help save the lives of people living nearby.

EVALUATE

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

CONTENT ASSESSMENT: Living with Lava Domes

Put these events in the correct order. Tell how a lava dome erupts.

- _____ Volcanic ash and gas shoot upward.
- _____ Once the gases have escaped, the explosion ends. The seal closes again.
- _____ Gases explode, breaking the seal.
- _____ Magma and gas rise from below Earth's surface.
- _____ Rising gases push on the sealed vent.
- _____ Lava flows slowly across the land.

Answer each question.

1. How are the scientists studying this volcanic system?

2. How can they use what they learn to help people living nearby?

SCIENCE

Standards Supported

- **NGSS Science and Engineering Practices: Asking Questions and Defining Problems:** Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)
- **NGSS Science and Engineering Practices: Asking Questions and Defining Problems:** Define a simple problem that can be solved through the development of an object, tool, process, or system that includes several criteria for success and constraints on materials, time, or cost. (3-5-ETS1-1)

Resources

- Content Assessment Master (page 14)
- Article Test (page 19)

Science Background

Machines can be complicated gadgets with lots of moving parts. Or, they can be quite simple. In fact, simple machines are machines that only have a few parts.

In this article, the fourth of a six-part series about simple machines, students will learn about screws. A screw is basically a ramp wrapped around a rod. The ridges of the ramp are called threads.

The number of threads affects how a screw does work. Fewer threads means you will need to use more force. But it will take less time to get the job done.

People use screws every day. The stem of a lightbulb is a screw. So is a spiral staircase. Screws are the perfect simple machine to use when you need to hold something in place or move something along.

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 screws.

EXPLORE

Display pages 16-17 of the projectable magazine. Invite students to examine the photos, headline, and deck. Brainstorm ideas about how the screws they see could hold things in place or move things along.

EXPLAIN

After reading, point out to students that a screw is a type of simple machine. **Ask:** *What do you call the ridges that go down the sides of a screw?* (threads) Have students turn and talk as they discuss how threads help a screw do work. (As you twist a screw, you provide the effort that creates the force that drives a screw forward.) Encourage students to discuss how the number of threads on a screw correlates to the amount of force needed and the time it takes to twist a screw into place. (A screw with fewer threads requires more force but takes less time to move than a screw with more threads.) Challenge students to explain how Archimedes' screw was different from most of the other screws featured in the article. (Most hold things in place. This one moves things (water) along.)

ELABORATE

Divide the class into small groups. Provide the necessary supplies and have groups complete the activity on pages 22-23 of their student magazines. After groups have completed the activity as directed, challenge them to think of a way another way to use a screw like this (PIONEER) or a way it could be improved (TRAILBLAZER).

EVALUATE

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

CONTENT ASSESSMENT: Something Screwy Going On

Do the experiment on pages 22-23 of your student magazine. Then write a complete sentence to answer each question.

1. Does this screw hold things in place or move things along? _____

2. Which supply made the threads on your screw? _____

3. In which step did your effort create a force? _____

4. What happened when you created that force? _____

5. How is your screw like Archimedes' screw? _____

6. How is it different? _____

Standards Supported

- **C3: History: Change, Continuity, and Context:** Compare life in the past to life today. (D2.His.2.K-2)
- **C3: History: Change, Continuity, and Context:** Compare life in specific historical time periods to life today. (D2.His.2.3-5)

Resources

- Ancient Egypt poster (Teacher's edition)
- Life in Egypt Then and Now poster (Teacher's edition)
- Content Assessment Master (page 16)
- Poster Test (page 20)

Social Studies Background

Making comparisons is the first step toward understanding how a place has changed over time. To fully appreciate these changes, students must be able to evaluate them from different perspectives: political, economic, social, cultural, etc. This process takes time to develop. Recognizing that, each month *Explorer* magazine will introduce students to a different ancient civilization. Use the accompanying lessons to guide students as they develop these skills.

ENGAGE

Encourage students to examine the maps and turn and talk with a partner to discuss what they see. Invite students to ask questions or share what they already know about Egypt.

EXPLORE

Display the **Ancient Egypt poster**. Point out that Lower Egypt is higher than Upper Egypt on the larger map. Brainstorm ideas to explain why these labels are correct. (The Nile River flows from south to north.)

EXPLAIN

Invite students to examine the **Ancient Egypt poster**. **Ask:** *Which cities were capitals in Ancient Egypt? (Memphis and Thebes) What is the capital of Egypt now? (Cairo) What important trait do these three cities share? (All are on the Nile River.)* Have students turn and talk to discuss reasons why the Nile was and still is important in Egypt. Then have students review the timeline and information to learn about Egypt's great leaders. Display the **Life in Egypt Then and Now poster**. Review the information as a class. Challenge students to identify similarities and differences between ancient Egyptian culture and Egyptian culture today.

ELABORATE

Inform students that they may know the Egyptian pharaoh Tutankhamun by another name: King Tut. Remind the class that King Tut died in 1337 B.C., but his tomb wasn't discovered until 1922. Divide the class into small groups. Have groups conduct research to learn more about King Tut. Instruct them to identify ways his leadership affected ancient Egypt. Challenge them to explain how the discovery of his tomb impacted the world today.

EVALUATE

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

CONTENT ASSESSMENT: Egypt Posters

Answer each question about Egypt.

<p>What is the geography like in Egypt?</p>	
<p>Why did ancient Egyptians build pyramids?</p>	
<p>How has language changed in Egypt since ancient times?</p>	

Write three other facts you learned about Egypt.

1.	
2.	
3.	

ARTICLE TEST: Extreme Plants

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

1. Why are castor bean seeds dangerous?
Ⓐ They are poisonous.
Ⓑ They sting.
Ⓒ They bite.

2. How does a Venus flytrap get food?
Ⓐ through its roots
Ⓑ with its leaves
Ⓒ from its stem

3. What do stinky flowers help a corpse flower do?
Ⓐ get food
Ⓑ stay safe
Ⓒ get pollinated

4. Which extreme plant grows so fast you can watch it grow?
Ⓐ castor bean plant
Ⓑ Venus flytrap
Ⓒ tortoise-shell bamboo

5. Why does the Venus flytrap need to catch bugs?

ARTICLE TEST: Living with Lava Domes

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

1. What does a cartographer do?
Ⓐ take photos
Ⓑ make maps
Ⓒ study volcanoes

2. How many lava domes does the Santa María volcano have?
Ⓐ three
Ⓑ four
Ⓒ five

3. When causes a lava dome to form?
Ⓐ Lava piles up.
Ⓑ Magma piles up.
Ⓒ Ash piles up.

4. When does the seal on a lava dome break?
Ⓐ before magma and gas rise
Ⓑ after lava flows
Ⓒ when gases explode

5. What happens when ash and volcanic rock mix with rainwater? Why is this dangerous?

ARTICLE TEST: Something Screwy Going On

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

1. Which of these screws would turn more easily?
 - Ⓐ a screw with fewer threads
 - Ⓑ a screw with more threads
 - Ⓒ a screw with spiral threads

2. Which of these screws takes less time to move?
 - Ⓐ a screw with fewer threads
 - Ⓑ a screw with more threads
 - Ⓒ a screw with spiral threads

3. What happens to the direction of force when you turn a screw?
 - Ⓐ It changes.
 - Ⓑ It stays the same.
 - Ⓒ It turns into a ramp.

4. What did Archimedes' screw do?
 - Ⓐ hold water in place
 - Ⓑ move water along
 - Ⓒ change water into ice

5. Why is a screw a simple machine?

POSTER TEST: Egypt Posters

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

1. What surrounds the Nile River in Egypt?
Ⓐ grasslands
Ⓑ mountains
Ⓒ desert

2. What is the capital of Egypt today?
Ⓐ Memphis
Ⓑ Cairo
Ⓒ Thebes

3. What language did ancient Egyptians speak?
Ⓐ Coptic
Ⓑ Muslim
Ⓒ Arabic

4. Which of these was an ancient Egyptian god?
Ⓐ Horus-Ra
Ⓑ Ramses II
Ⓒ Tutankhamun

5. Why is the Nile River so important to Egypt?

Pioneer and Trailblazer

ANSWER KEY

Extreme Plants

Assess Content, page 10

Answers will vary depending on which plant students choose to draw. However, drawings should depict the plant using its adaptations and answers should contain information from the article.

Article Test, page 17

1. A; 2. B; 3. C; 4: C; 5: Venus flytraps live in poor soil. They can't get what they need from the soil. So, they soak up nutrients from bugs.

Living with Lava Domes

Assess Content, page 12

Event order: 4, 6, 3, 1, 2, 5.

1. They are taking lots of photos, making maps, and drawing diagrams to show how the lava domes change over time.
2. Possible response: If they understand exactly what causes the lava domes to erupt, they might be able to predict when they will erupt and warn people living nearby. That would save lives.

Article Test, page 18

1. B; 2. B; 3. A; 4: C; 5: The ash, volcanic rock, and rainwater make a muddy mix that flows quickly down the volcano. It can destroy whole towns.

Something Screwy Going On

Assess Content, page 14

1. It moves things along.
2. The plastic tubing creates the threads.
3. I created a force in step 5.
4. Water moved up the tubing when I created a force.
5. Both screws moved water from one place to another.
6. The screw was inside the tube in Archimedes' screw. It is outside the tube in this one.

Article Test, page 19

1. B; 2. A; 3. A; 4: B; 5: A screw has a few parts and it helps us do work faster, farther, or more easily than we can without it.

Egypt Posters

Assess Content, page 16

1. Large areas of desert surround the Nile River.
2. They built pyramids to honor their gods and pharaohs. Pharaohs were buried in pyramids.
3. Ancient Egyptians wrote in hieroglyphics or hieratic. They spoke Coptic. Today, Egypt's official language is Arabic.

Additional facts will vary, but all should come from the Egypt posters.

Poster Test, page 20

1. C; 2. B; 3. A; 4: A; 5: Without the Nile, all of Egypt would be a desert. The Nile floods every summer. This makes the ground on either side of the river fertile for plants and crops to grow.