K–5 Reading Language Arts

ENGLISH

THIS PLANET ROCKS

GRADE 1 UNIT 5 | TEACHER GUIDE

Grade 1 | Unit 5

This Planet Rocks

Teacher Guide

Acknowledgement:

Thank you to all the Texas educators and stakeholders who supported the review process and provided feedback. These materials are the result of the work of numerous individuals, and we are deeply grateful for their contributions.

Notice: These learning resources have been built for Texas students, aligned to the Texas Essential Knowledge and Skills, and are made available pursuant to Chapter 31, Subchapter B-1 of the Texas Education Code.

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THIS PLANET ROCKS

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Introduction

This introduction includes the necessary background information to be used in teaching the *This Planet Rocks* unit. The Teacher Guide for *This Planet Rocks* contains eight daily lessons, each of which is composed of two distinct parts, so the lesson may be divided into smaller chunks of time and presented at different intervals during the day. The entire lesson will require a total of sixty minutes.

This unit includes a Pausing Point following Lesson 4, after the layers of the earth have been introduced. At the end of the unit, a Unit Review, a Unit Assessment, and Culminating Activities are included to allow time to review, reinforce, assess, and remediate content knowledge. You should spend no more than fourteen days total on this unit.

UNIT COMPONENTS

Along with this Teacher Guide, you will need:

- Flip Book for *This Planet Rocks*
- Image Cards for *This Planet Rocks*
- Activity Book for *This Planet Rocks*
- Digital Components for *This Planet Rocks*

All unit components' materials can be found in the digital version provided with the program's online materials.

WHY THIS PLANET ROCKS IS IMPORTANT

In this unit, students will learn about the geographical features of the earth's surface. They will also learn about the inside of the earth and characteristics of its various layers.

Students will learn about the shape of the earth, the North and South Poles, and the equator. Students will also learn the names of the layers of the earth—the crust, the mantle, and the core—and the characteristics of each layer. Students will learn how occurrences such as volcanoes and geysers give information about the layers of the earth.

The Read-Alouds also focus on minerals and rocks. Students will learn about the importance of rocks and minerals in their daily lives. They will also learn about the three types of rocks and the characteristics of each type. Students will learn how rocks and minerals are taken from the earth's crust to be used by people. Students will also learn about fossils and their importance in giving us knowledge about the history of living things on the earth.

We recommend that you provide a collection and visual representations of fossils, rocks, and the dinosaur models for tactile learning and find plenty of opportunities for students to interact with these.

Students will receive a good introduction to the basics of geology and paleontology. These topics will be reviewed and extended in much greater depth in Grade 4.

This unit also provides opportunities for students to build content knowledge and draw connections to the science and social studies subject areas. At times throughout the unit, you may wish to build on class discussions to support students in making cross-curricular connections to the strands of Earth and Space, Matter and Its Properties, Scientific and Engineering Practices, and Recurring Themes and Concepts from the Science TEKS, as well as the strand of Geography from the Social Studies TEKS. This content is not a replacement for grade-level science and social studies instruction.

WHAT STUDENTS HAVE ALREADY LEARNED DURING KINDERGARTEN

The following units, and the specific core content that was targeted in those units, are particularly relevant to the Read-Alouds students will hear in *This Planet Rocks*. This background knowledge will greatly enhance students' understanding of the Read-Alouds they are about to enjoy:

Plants: How Do They Grow? (Kindergarten)

CORE CONTENT OBJECTIVES ADDRESSED IN THIS UNIT

Students will:

- Explain that different scientists study the different kinds of rocks that make up the earth
- Identify geographical features of the earth's surface: oceans and continents
- Locate the North Pole, the South Pole, and the equator on a globe
- Describe the shape of the earth
- Identify and describe the layers of the earth: crust, mantle, and core (outer and inner)
- Describe how heat, pressure, and time cause many changes inside the earth
- Describe volcanoes
- Describe geysers
- Identify common minerals in the earth
- Explain how minerals are used by people
- Identify the three types of rocks: igneous, sedimentary, and metamorphic
- Describe how heat, pressure, and time cause the formation of igneous, sedimentary, and metamorphic rocks
- Describe fossils
- Explain how fossils provide information about animals and plants that lived long ago
- Explain how we know about dinosaurs

CORE VOCABULARY FOR THIS PLANET ROCKS

The following list contains all of the core vocabulary words in *This Planet Rocks* in the forms in which they appear in the Read-Alouds. Bold-faced words in the list have an associated Word Work activity. The inclusion of the words on this list does not mean that students are immediately expected to be able to use all of these words on their own. However, through repeated exposure throughout the lessons, they should acquire a good understanding of most of these words and begin to use some of them in conversation.

Lesson 1 equator geologist geology pressure **surface**	**Lesson 4** **destructive** geysers lava magma	**Lesson 7** fossil impression paleontologist **preserved**
Lesson 2 core crust eroded **layer** mantle	**Lesson 5** **characteristics** gemstones minerals traces	**Lesson 8** debris excavating **extinct** meteorite meteors
Lesson 3 erupts liquid molten **solid** volcano	**Lesson 6** igneous rock metamorphic rock ore sedimentary rock **sediments**	

WRITING

In this unit, students will explore writing friendly letters. Students were introduced to the format and parts of a friendly letter in *Early American Civilizations: Aztecs, Maya, Incas*. Students will work as a class to write a letter to the geologist from the Read-Alouds, describing what they learned about the earth's crust. In later lessons, students will work with a partner to write a letter to the paleontologist from the read-alouds, describing what they learned about fossils. Students will also work with a partner to write a letter to someone of their choice, describing what they learned about dinosaurs. They will identify important facts and information during and after Read-Alouds to use in writing the letters.

In addition to letter writing, students will draw and write about a Read-Aloud and create an idea web graphic organizer to record information about minerals.

The following activities may be added to students' writing portfolios to showcase student writing within and across units:

- Drawing the Read-Aloud (Lesson 1)
- Idea Web: Minerals (Lesson 5)
- Friendly Letters (Lessons 2, 7, and 8)
- any additional writing completed during the Pausing Point, Unit Review, or Culminating Activities

FOUNDATIONAL ORAL LANGUAGE

The Think-Pair-Share and Turn and Talk prompts throughout the unit provide opportunities to teach and reinforce how to communicate by using conventions of language, speaking when recognized, and making appropriate contributions to discussion.

- You can also reinforce these ideas by modeling using an appropriate pace, recognizing students' individual contributions to group discussions, and pointing out conventions of language.
- Explain to students that when working in whole/small groups, group members share responsibility for the work they do together. To work effectively and respectfully, everyone should recognize the contributions made by each group member. For example, as group members discuss a text, each group member can share thoughts and reactions. If preparing to return to a whole-group discussion, group members can summarize the group's ideas by including contributions from everyone in the group.
- Consider using a discussion checklist that tracks student participation, as well as introducing discussion techniques that enhance participation.

TEKS 1.1.C; TEKS 1.1.D

TEKS 1.1.C Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.1.D** Work collaboratively with others by following agreed-upon rules for discussion, including listening to others, speaking when recognized, and making appropriate contributions.

LESSON

1

THIS PLANET ROCKS

Our Home, Earth

PRIMARY FOCUS OF LESSON

Speaking and Listening

Students will review where they live as it relates to the planet Earth.

TEKS 1.1.C; TEKS 1.6.E

Reading

Students will identify features of the earth.

TEKS 1.6.G

Language

Students will recognize spoken alliteration or groups of words that begin with the same spoken onset or initial sound.

TEKS 1.2.A.ii

Students will demonstrate understanding of the Tier 2 word *surface*.

TEKS 1.3.B

Writing

Students will draw and write about features of the earth.

TEKS 1.3.B; TEKS 1.7.B; TEKS 1.7.E

FORMATIVE ASSESSMENT

Drawing the Read-Aloud

Our Home, Earth Students will draw and write about three things they learned about the earth.

TEKS 1.7.B; TEKS 1.7.E

TEKS 1.1.C Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.6.E** Make connections to personal experiences, ideas in other texts, and society with adult assistance; **TEKS 1.6.G** Evaluate details to determine what is most important with adult assistance; **TEKS 1.2.A.ii** Demonstrate phonological awareness by recognizing spoken alliteration or groups of words that begin with the same spoken onset or initial sound; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.7.B** Write brief comments on literary or informational texts; **TEKS 1.7.E** Interact with sources in meaningful ways such as illustrating or writing.

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud (10 min.)			
Core Connections	Whole Group	10 min.	❑ globe ❑ Where Are We? Chart (Digital Components)
Where Are We?			
Read-Aloud (30 min.)			
Purpose for Listening	Whole Group	30 min.	❑ Flip Book: 1A-1–1A-12 ❑ globe
"Our Home, Earth"			
Comprehension Questions			
Word Work: *Surface*			
This is a good opportunity to take a break.			
Application (20 min.)			
Multiple-Meaning Word Activity: *Stick*	Whole Group/ Independent	20 min.	❑ Poster 1M: Stick (Flip Book) ❑ paper ❑ drawing tools ❑ writing tools
Drawing the Read-Aloud			
Take-Home Material			
Family Letter			❑ Activity Page 1.1

ADVANCE PREPARATION

Introducing the Read-Aloud

- Create a Where Are We? chart like the following, showing a graded diagram of where students live. Alternatively, you can access a digital version in the online materials for the unit.

Read-Aloud

- Place familiar items, such as a stapler, marker, basket, etc., on the surfaces of classroom tables and desks for the Word Work activity.

Notes to Teacher

You may wish to leave the Where Are We? chart on display for the entire unit to help students grasp the idea of where they are on the planet Earth.

It may be difficult for students to understand the idea that the earth is rotating, because they cannot feel the movement. If necessary, explain to students that we do not feel the earth move because the motion is very smooth and everything else is moving at the same time. Remind students that they know that the earth is moving because the sun and stars seem to move across the sky over time.

CORE VOCABULARY

equator, n. the imaginary line around the middle of the earth that divides it into two equal halves
Example: Isabelle is from Ecuador, which is a country in South America near the equator.
Variation(s): none

geologist, n. a scientist who studies rocks and what's inside the earth
Example: A geologist spoke to the class about her studies in Hawaii.
Variation(s): geologists

geology, n. the study of the earth
Example: In his spare time, he reads books to learn more about geology.
Variation(s): none

pressure, n. the continuous force of weight created when something presses or pushes against something else
Example: The continued air pressure in the balloon made it pop.
Variation(s): none

surface, n. the outside or top layer of something
Example: She wiped the surface of the table with a wet cloth after dinner.
Variation(s): surfaces

Vocabulary Chart for "Our Home, Earth"

Type	**Tier 3** **Unit-Specific Words**	**Tier 2** **General Academic Words**	**Tier 1** **Everyday Speech Words**
Vocabulary	equator (*ecuador*) geologist (*geólogo/a*) geology (*geología*)		
Multiple-Meaning	pressure	surface	
Sayings and Phrases	barely begins to scratch the surface		

Lesson 1: Our Home, Earth

Introducing the Read-Aloud

10M

Speaking and Listening: Students will review where they live as it relates to the planet Earth.

TEKS 1.1.C; TEKS 1.6.E

CORE CONNECTIONS (5 MIN.)

- Tell students that this unit is called *This Planet Rocks*. Review with students that *history* refers to things that happened in the past.
- Ask students to name the planet where we live. *(Earth)*
- Explain that the planet Earth is made up of billions of pieces of rock.
- Explain that a billion is a very, very long number, which means that Earth has many, many rocks to explore.
- Emphasize that scientists are always discovering new things about the earth and our universe. Studying rocks of the earth can tell us fascinating things about how our planet works and how its surface changes over time.
- Tell students they will be learning about rocks and minerals, fossils, volcanoes, and geysers.
- Ask a few students to briefly share what they might know about rocks and minerals, fossils, volcanoes, and geysers. *(Answers may vary.)*

WHERE ARE WE? (5 MIN.)

- Show students a globe, and tell them that it is a model, or a small copy, of the earth. Models are used to learn about things that are too big or too far away to study in the classroom.
- Tell students that you will use the globe to help them learn about the earth, the planet where we live.

Support

Write the number 1,000,000,000 on the board or chart paper so students can get a sense of how long the number is.

EMERGENT BILINGUAL STUDENTS

Speaking and Listening

Exchanging Information and Ideas

Beginning
Ask students simple yes/no questions (e.g., "Have you heard of volcanoes?").

Intermediate
Encourage students to build on what the previous student said about volcanoes.

Advanced/Advanced High
Challenge students to say something more about what the previous student said about volcanoes.

ELPS 2.G; ELPS 2.I

TEKS 1.1.C Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.6.E** Make connections to personal experiences, ideas in other texts, and society with adult assistance.

- Review with students details about where they live. Point to the appropriate location on the globe as you say the following:
  - You live in (your city)
  - (Your city) is in the state of Texas
  - Texas is in the country of the United States of America
  - The United States of America is on the continent of North America
  - North America is on planet Earth
- Direct students' attention to the Where Are We? chart you prepared in advance.
- Ask students to describe what they see. *(Answers may vary.)*
- Explain that all of the places you just pointed to on the globe are presented in a different way in the chart:
  - The city we live in is the smallest part and at the top of the diagram.
  - Each level after that is a little bit bigger than the one above it.
  - All of these levels are part of Earth.
- Explain that even though it seems that the ground we stand on is flat and still, we actually live on only a tiny part of a huge sphere, or ball, just like this globe. This huge sphere is called Earth.
- Remind students that they already learned about the solar system—our home in space—in the *Astronomy: Space Exploration* unit, and that Earth, the planet on which we live, is just one of eight planets within the solar system.
- Tell students that the earth is covered by both land and water. Point out the colors used to distinguish land and water on the globe.
- Preview with students that another name for Earth's land masses is continents.
- Ask students what they know about the continents. *(Answers may vary.)*
- Preview with students that bodies of water on Earth are called oceans.
- Ask students what they know about the oceans. *(Answers may vary.)*

Check for Understanding

Evaluate an Idea: Where do we live? Be specific. [Have students reference the Where Are We? chart as needed.] *(in [your city], which is in Texas, which is in the United States of America, which is on the continent of North America, which is on the planet Earth)*

Lesson 1: Our Home, Earth

Read-Aloud

30M

Reading: Students will identify features of the earth.

TEKS 1.6.G

Language: Students will recognize spoken alliteration or groups of words that begin with the same spoken onset or initial sound.

TEKS 1.2.A.ii

Language: Students will demonstrate understanding of the Tier 2 word *surface*.

TEKS 1.3.B

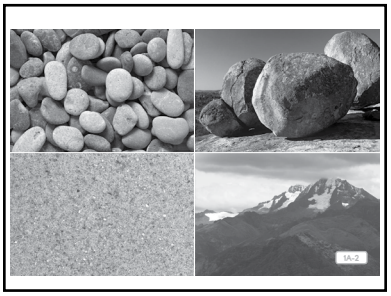
PURPOSE FOR LISTENING

- Tell students that today they are going to meet an interesting scientist who knows a lot about the earth.
- Tell them to listen carefully to learn more about the earth.

"OUR HOME, EARTH" (15 MIN.)

Show Image 1A-1: Gerry the Geologist

Hello, kids! My name is Gerry and I'm a **geologist**. *Let's call him "Gerry the Geologist!" Do you hear how the beginning sound of "Gerry" and "Geologist" are the same? That's called alliteration.* A geologist is a type of scientist. A scientist studies and learns all about the world in which we live. Geologists are scientists who study rocks and what's inside the earth. **TEKS 1.2.A.ii**

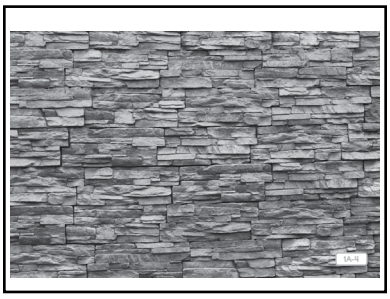


Show Image 1A-2: Collage of rocks

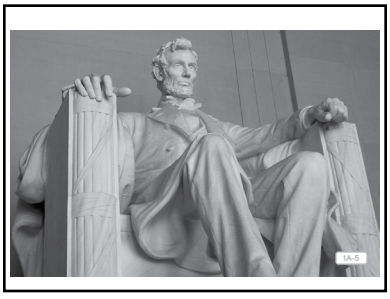
That's right: rocks! From pebbles to stones to boulders, from a grain of sand to the highest mountain, rocks are everywhere. And I want you to know all about rocks, from how they are created to how they are used in people's everyday lives.

TEKS 1.6.G Evaluate details to determine what is most important with adult assistance; **TEKS 1.2.A.ii** Demonstrate phonological awareness by recognizing spoken alliteration or groups of words that begin with the same spoken onset or initial sound; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings.

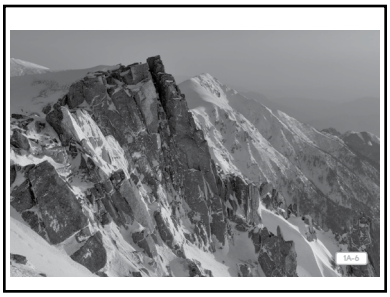
Show Image 1A-3: Jeweled crown
People used minerals to make the jewels on this crown.



Show Image 1A-4: Rock wall
People use rocks to make buildings, walls, and streets.



Show Image 1A-5: Marble statue of Abraham Lincoln
A sculptor carved a big rock to make this sculpture of Abraham Lincoln.

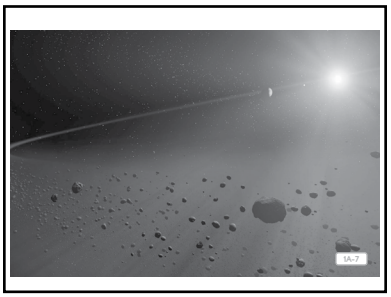


Show Image 1A-6: Rocky mountain vista

Geologists use rocks to learn about the earth. In the ancient Greek language, the word *geo* means earth, and *–ology* means "the study of." When we combine these word parts, we have *geo-ology*, or just ***geology***, which is the study of the earth. Since the earth is mostly made of rock, we geologists spend most of our time studying rocks. Many of the rocks we see on the **surface** of the earth, from mountains down to pebbles, are created by incredible forces at work deep inside the earth. *The surface of the earth is the outside or top layer of the earth. We walk and live on the surface of the earth. Have you ever wondered about what's inside the earth, or under the surface where we walk and live?* Thus, geologists study not only rocks but also the forces at work inside the earth and on the earth's surface. We study the whole earth.

Check for Understanding

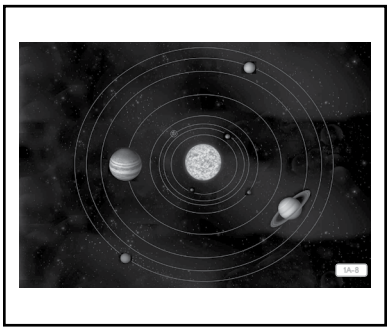
Vocabulary: Geology is the study of what? *(the earth)* What does each part of the word *geology* mean? (*geo* means earth; *–ology* means "the study of")



Show Image 1A-7: Outer space

There are lots of rocks on our planet. Think about sand on a beach. Each grain of sand is a tiny piece of rock, broken apart by the oceans. If I have a one-foot square box filled with the smallest grains, there could be over four-and-a-half billion grains of sand in that box. That is a lot of tiny rocks.

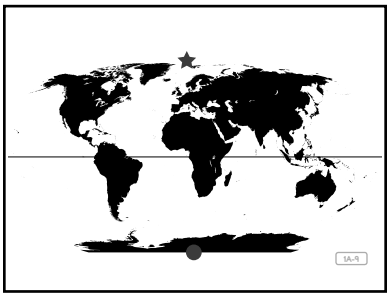
[Draw a one-foot square and write the number four-and-a-half billion (4,500,000,000) for students so that they can get a sense of how many different rock particles are on earth.] Big rocks can get formed from tiny rocks, pressed hard together, with heat, over time. Many scientists think of Earth like this. Imagine billions of little bits and pieces of dust and rock floating around our sun. Those floating bits and pieces get stuck together with enough heat and pressure and time until they make up all of the Earth. A similar process would explain our planet's neighbor, the moon, and the other planets.



Show Image 1A-8: Diagram of the solar system

Maybe you already know that Earth is a planet. Earth is one of eight major planets that orbits the sun. *[Point to Earth on the diagram.] Earth is the third planet from the sun.* Do you know the names of any of the other planets? *[Pause for responses and point out each planet on the diagram.]* I do! Mercury, Venus, Mars, Jupiter, Saturn, Uranus, and Neptune.

Like the other planets in the solar system, Earth is trapped in the gravitational pull of the sun. This causes Earth to orbit, or revolve, around the sun. It takes one year, about 365 days, for Earth to complete an orbit around the sun. *[Ask two students to demonstrate by having one student be the stationary sun and the other be the orbiting Earth.]*



Show Image 1A-9: World map

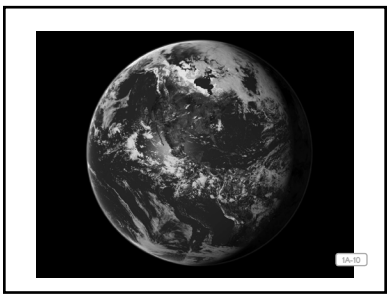
Earth's orbit around the sun is not the *only* way Earth moves in space, however.

This map shows the earth's North and South Poles. *[Point to the North and South Poles in the diagram.] There is a star marking the North Pole and a circle marking the South Pole.* The North and South Poles are the northernmost and southernmost parts of the earth. The axis of rotation is like an imaginary line or stick going right through the earth at the North and South Poles. *Here, the word* stick *means a long, thin piece of wood.* There is not really a stick running through the earth around which it turns. The axis is an imaginary line around which Earth rotates. The earth rotates, or spins, in the same way that a globe spins—on its axis. It takes one day, or twenty-four hours, for Earth to make a complete rotation. *[Use a globe to demonstrate rotation.] It takes one day for Earth to go all the way around its axis. As the earth rotates, it also orbits the sun. [You may wish to demonstrate both motions of Earth by turning around and around as you walk in a circle around a student volunteer playing the stationary sun.]*

The map also shows the **equator**, an imaginary line around the middle of the earth. *[Point to the equator on the map. Tell students that the word* equator *sounds like the word* equal*. We can remember that the equator cuts the earth into two equal halves.]* The equator divides the earth into two equal halves. The area along the equator receives the most direct sunlight and is therefore warm year-round.

Support

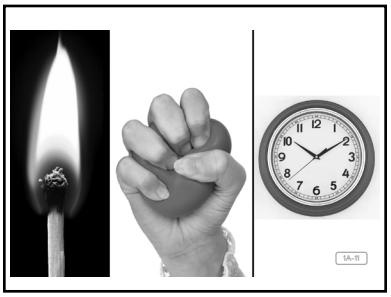
The word *stick* also means to attach something to a surface using glue or tape, kind of like a sticker.



Show Image 1A-10: Earth from space

Earth is sphere-shaped, like a ball, and it is surrounded by a thick blanket of air, called an atmosphere, where clouds float around. Most of the earth's surface is covered with water in the form of the five oceans: *[Point out the oceans and continents that are visible as you read.]* Pacific, Atlantic, Indian, Arctic, and Southern (or Antarctic). And between these oceans there is land in the form of seven continents: North America, South America, Europe, Africa, Asia, Australia, and Antarctica.

People haven't always known that the earth is round or that it rotates on its axis as well as orbits the sun; they haven't always known that there are five oceans and seven continents, or that most of the surface is covered in water. It has taken hundreds of years for scientists and explorers to develop all the knowledge about the earth that I just described in the last few minutes. But this barely begins to scratch the surface of what we now know about the earth. *"This barely begins to scratch the surface" is a phrase that people say when they mean that they have learned a small part about something and that there is still so much more to learn about that something. By exploring, asking questions, and digging deeper into the information we can learn more about the earth.*



Show Image 1A-11: Heat, pressure, and time

There are three important words you need to keep in mind whenever you are thinking about geology, which is the study of the earth. *Heat* is the first. You can feel heat from a flame or from the sun on a sunny day. Heat causes many changes to the earth.

The second word is ***pressure***, like the force you use when you push on something. *[Pause for students to push their hands together using pressure.]* Pressure, or the force of weight, also causes many changes to the earth.

Time is the third important geology word to remember. To understand geology, you need to think about time in a whole new way. Forget about minutes, hours, and days. These amounts of time don't mean much in geology. Geologist think in terms of many years. A little pressure and heat and a long time can make a big difference. It works the other way, too. A lot of heat or pressure in a short time can make a great deal of difference

Show Image 1A-12: Grand Canyon with view of Colorado River

The Grand Canyon, located in Arizona, provides a lot of clues about how parts of the earth formed. Rushing water in the river carved through the rocks over time to make this canyon. No other place on earth allows me to see and study so many different layers of rock at the same time. The Grand Canyon displays more than 20 layers of rock, and each layer is like a page in Earth's History book. Each layer weighs down on the rock below it, building up lots of pressure over time.

Remember: heat, pressure, and time are the main factors of geology. If you understand those three words, then you are ready to move ahead and learn many things about the earth. *[Have students chant three times, "Heat! Pressure! Time!"]*

COMPREHENSION QUESTIONS (10 MIN.)

1. **Literal.** What does Gerry the Geologist study? *(Gerry the Geologist studies rocks to learn about the earth.)*
2. **Evaluative.** Think-Pair-Share: How are rocks used by people? *(Rocks are used by people in jewelry making, in building, and in art.)* How have you ever used rocks? *(Answers may vary.)*
3. **Literal.** What is the shape of the earth? *(The earth is shaped like a sphere, which is just like the shape of a ball.)* What do we call the land and water that cover the surface of the earth? *(The land that covers the surface of the earth is called continents and the water is called oceans.)*
4. **Literal.** What are the North and South Poles? *(The North Pole is the northernmost point on the earth. The South Pole is the southernmost point on the earth.)* [Have a student locate the North Pole on the globe. Ask another student to locate the South Pole on the globe.] What is the equator? *(The equator is an imaginary line around the middle of the earth that divides the earth into two equal halves.)* [Have a student locate the equator on the globe.]
5. **Inferential.** When we talk about the rocks that make up the earth are we talking about a few rocks or a lot of rocks? *(When we talk about the rocks that make up the earth, we are talking about a lot of rocks, as in billions of them.)*

EMERGENT BILINGUAL STUDENTS

Speaking and Listening

Selecting Language Resources

Beginning
Rephrase open-ended questions as simple yes/no questions, (e.g., "Have you ever used rocks for something?").

Intermediate
Provide students with a specific sentence frame (e.g., "I have used rocks to . . .").

Advanced/Advanced High
Encourage students to use key details in complete sentences (e.g., "I have used rocks to create the edge of a flower bed for my grandmother.").

ELPS 2.G; ELPS 3.C

Check for Understanding

Recall: What are some of the features of the earth? *(shaped like a sphere; has a North and South Pole; has the equator; has oceans and continents; is mostly made of rock)*

WORD WORK: SURFACE (5 MIN.)

1. In the Read-Aloud you heard, "Many of the rocks we see on the surface of the earth, from mountains down to pebbles, are created by incredible forces at work deep inside the earth."
2. Say the word *surface* with me.
3. The *surface* of something is the outside or top layer of it. [Point out some surfaces in the classroom.]
4. I put the tea kettle on the surface of the stove.
5. Have you ever put something on the surface of an object, such as a table or desk? Try to use the word *surface* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "I put _____ on the surface of _____."]
6. What's the word we've been talking about?

Use a Naming activity for follow-up. I have placed several objects on surfaces in the classroom. I would like you to identify what is on each surface. For example, I might ask, "What is on the surface of the desk?" Be sure to use the word *surface* and answer in complete sentences. [You may wish to provide the sentence frame "_____ is on the surface of the desk."]

Lesson 1: Our Home, Earth

Application

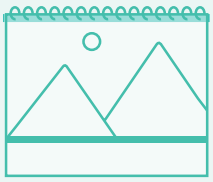
20M

Writing: Students will draw and write about features of the earth.

TEKS 1.3.B; TEKS 1.7.B; TEKS 1.7.E

MULTIPLE-MEANING WORD ACTIVITY: STICK (5 MIN.)

Flip Book Poster 1M



Show Poster 1M (Stick)

- Tell students in the Read-Aloud they heard, "The axis of rotation is like an imaginary line or 'stick' going right through the earth at the North and South Poles."
- Explain that in this sentence, *stick* means a long, thin piece of wood. Explain that you can imagine the axis of rotation as a stick that has been stuck through the earth.
- Have students hold up one, two, or three fingers to indicate which image on the poster shows this meaning. *(one finger)*
- Explain that *stick* can also mean to push something into something else.
- Have students hold up one, two, or three fingers to indicate which image on the poster shows this meaning. *(two fingers)*
- Explain that *stick* can also mean to attach something to a surface using glue or tape.
- Have students hold up one, two, or three fingers to indicate which image on the poster shows this meaning. *(three fingers)*
- With a partner, have students create a sentence for each meaning of *stick*. Tell them you will call on a few students to share what they came up with. Remind them to use complete sentences. *(Answers may vary.)*

Check for Understanding

Hold Up Fingers: Which image on the poster relates to the meaning of *stick* that is something that attaches to a surface? *(three fingers)* Which image on the poster relates to the meaning of *stick* that is a long, thin piece of wood? *(one finger)* Which image on the poster relates to the meaning of *stick* that is to push something into something else? *(two fingers)*

TEKS 1.3.B Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.7.B** Write brief comments on literary or informational texts; **TEKS 1.7.E** Interact with sources in meaningful ways such as illustrating or writing.

DRAWING THE READ-ALOUD (15 MIN.)

- Tell students to think about the Read-Aloud they listened to earlier, "Our Home, Earth."
- Tell them to draw three details they remember from the Read-Aloud.
- Explain that the drawing does not have to recreate a "scene" from the Read-Aloud or represent a coherent, integrated drawing of the Read-Aloud; students may draw any three "things" that they remember from the Read-Aloud.
- Have students also write a sentence about each of the three things using the sound–spelling correspondences they have been taught thus far.
- Have a student repeat the directions: 1. draw three details from the Read-Aloud; 2. write a sentence about each detail.
- When students have finished, give them the opportunity to share their drawings and writing with a partner or the entire class.

End Lesson

Lesson 1: Our Home, Earth

Take-Home Material

FAMILY LETTER

- Send home Activity Page 1.1.

EMERGENT BILINGUAL STUDENTS

Writing

Writing

Beginning
Have students use phrases and familiar vocabulary to describe their drawings.

Intermediate
Have students describe their drawings using short sentences.

Advanced/Advanced High
Have students describe their drawings using longer, more detailed sentences.

ELPS 5.F

Challenge

Have students describe three related or sequential ideas from the Read-Aloud and use them to create a paragraph.

Support

As students share, expand their responses using richer and more complex language, including, if possible, any Read-Aloud vocabulary.

Activity Page 1.1

LESSON

2

THIS PLANET ROCKS

The Earth Inside-Out, Part I

PRIMARY FOCUS OF LESSON

Speaking and Listening

Students will review features of the earth.

TEKS 1.1.C; TEKS 1.3.D; TEKS 1.11.D.vi

Reading

Students will identify the layers of the earth and describe the crust.

TEKS 1.6.G

Language

Students will demonstrate understanding of the Tier 2 word *layer*.

TEKS 1.3.B; TEKS 1.6.E

Writing

With assistance, students will dictate or write a friendly letter about the earth's crust.

TEKS 1.3.D; TEKS 1.12.C

Speaking and Listening

Students will develop social communication.

TEKS 1.1.E

FORMATIVE ASSESSMENT

Exit Pass

In, On, or Above the Crust Students will identify whether items are in, on, or above the earth's crust.

TEKS 1.3.D

TEKS 1.1.C Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.3.D** Identify and use words that name actions, directions, positions, sequences, categories, and locations; **TEKS 1.11.D.vi** Edit drafts using conventions of standard English, including prepositions; **TEKS 1.6.G** Evaluate details to determine what is most important with adult assistance; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.6.E** Make connections to personal experiences, ideas in other texts, and society with adult assistance; **TEKS 1.12.C** Dictate or compose correspondence such as thank you notes or letters; **TEKS 1.1.E** Develop social communication such as introducing himself/herself and others, relating experiences to a classmate, and expressing needs and feelings.

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud (10 min.)			
What Have We Already Learned?	Whole Group	10 min.	❑ globe ❑ star sticker ❑ circle sticker ❑ red string/yarn ❑ box/container ❑ small ball
Read-Aloud (30 min.)			
Purpose for Listening "The Earth Inside-Out, Part I" Comprehension Questions Word Work: *Layer*	Whole Group	30 min.	❑ Flip Book: 2A-1–2A-11 ❑ ruler or yardstick ❑ U.S. map ❑ glass jar ❑ potting soil ❑ red clay ❑ rock
This is a good opportunity to take a break.			
Application (20 min.)			
Vocabulary Instructional Activity Friendly Letter: Earth's Crust	Whole Group	20 min.	❑ Letter Format Poster (Digital Components) ❑ In/On/Above Chart (Digital Components) ❑ Flip Book: 2B-1 ❑ board/chart paper ❑ index cards

ADVANCE PREPARATION

Introducing the Read-Aloud

- On the globe you will use during this unit, place a star sticker on the North Pole and a circle sticker on the South Pole. Place a piece of red string or yarn around the middle of the globe to highlight the equator.
- Gather a box or container and a small ball.

Read-Aloud

- To model layers of topsoil, clay, and bedrock for students, fill a glass jar with potting soil, red clay, and rock so they can easily see the changes in color and texture between layers.
- Determine a location that is about three miles from where your school or city is. Also determine a location that is about twenty miles from where your school or city is. You will use this information during the Read-Aloud.

Application

- Prepare and display the Letter Format poster you used in *Early American Civilizations: Aztecs, Maya, Incas*. Alternatively, you can access a digital version in the online materials for the unit.

Letter Format Poster	
Greeting	Dear Ms. Bland,
Body	Thank you for the letter you sent last week, as well as the flowers. I hope you have a wonderful day.
Closing	Love,
Signature	Anna

- Prepare an In/On/Above chart with three columns and the following column labels: In, On, Above. Alternatively, you can access a digital version in the online materials for the unit.

In	On	Above

Notes to Teacher

You will review the purpose and structure of a friendly letter in this lesson. Students will also write friendly letters in future lessons. You may wish to review Lesson 8 in the *Early American Civilizations: Aztecs, Maya, Incas* unit to prepare to discuss a friendly letter with students in this lesson.

Students may struggle with this content material if they do not understand the prepositions *in*, *on*, and *above*. Be sure that students are clear about the meanings of these frequently used prepositions.

Universal Access

- You may wish to find images of layers of different things to help students understand the concept of layers.

CORE VOCABULARY

core, n. the center of the earth
Example: It is impossible to journey to the earth's core because it is too hot for humans.
Variation(s): none

crust, n. the outermost layer of the earth
Example: The workers drilled a few inches into the earth's crust.
Variation(s): none

eroded, v. wore away
Example: Wind and sand eroded the writing on the Sphinx.
Variation(s): erode, erodes, eroding

layer, n. a part that lies over or under another part
Example: The baker added a thin layer of chocolate to the cake.
Variation(s): layers

mantle, n. the layer of the earth between the crust and the core
Example: The mantle is the layer beneath the earth's crust.
Variation(s): none

Vocabulary Chart for "The Earth Inside-Out, Part I"

Type	Tier 3 Unit-Specific Words	Tier 2 General Academic Words	Tier 1 Everyday Speech Words
Vocabulary	eroded (*erosionado*)	layer	
Multiple-Meaning	core crust mantle *(manto)*		
Sayings and Phrases	on the other hand an open book		

Start Lesson

Lesson 2: The Earth Inside-Out, Part I

Introducing the Read-Aloud

10M

Speaking and Listening: Students will review features of the earth.

TEKS 1.1.C; TEKS 1.3.D; TEKS 1.11.D.vi

WHAT HAVE WE ALREADY LEARNED? (10 MIN.)

- Using the globe, remind students that the earth is covered by land and water.

Check for Understanding

One-Word Answer: What is the name for land that covers the earth? *(continents)* What is the name for water that covers the earth? *(oceans)*

- Ask students what Gerry the Geologist studies. *(rocks)* Explain that the earth is mostly made up of rocks.
- Ask students to name the following, as you point to each place on the globe:
  - the northernmost point of the earth [Point to the star sticker you placed on the globe.] *(the North Pole)*
  - the southernmost point of the earth [Point to the circle sticker you placed on the globe.] *(the South Pole)*
  - the imaginary line that runs around the middle of the earth and divides the earth into two equal halves, a northern half with the North Pole and a southern half with the South Pole [Point to the red string or yarn you placed around the middle of the globe.] *(equator)*
- Note that you placed the stickers and the string/yarn on the globe to help remind students about these features of the earth.

TEKS 1.1.C Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.3.D** Identify and use words that name actions, directions, positions, sequences, categories, and locations; **TEKS 1.11.D.vi** Edit texts using conventions of standard English, including prepositions.

- Ask students to chant three times the three important words that Gerry the Geologist said to remember when thinking about geology. *(Heat! Pressure! Time!)*
- Ask students what these three words have in common when thinking about geology. *(All three cause changes to the earth.)*
- Remind students they have also learned about the surface of the earth. Ask them what the surface of something is. *(the outside or top layer of something)*
- Explain that today students are going to learn about the inside of the earth.
- Put the box/container and the ball you prepared in advance on a table or your lap.
- Place the ball in the box and explain that the ball is now in the box. The ball is surrounded by the box on all sides.
- Then, place the ball on the box and explain that the ball is resting on the box. The ball is touching the box but only from the outside as it rests on the box.
- Finally, hold the ball above the box and explain that the ball is above the box and is not touching any part of the box.
- Call on a few students to move the ball to be in, on, or above the box based on your directions.
- Have students work in pairs to create sentences describing things that could be in, on, or above the box.

EMERGENT BILINGUAL STUDENTS

Language

Analyzing Language Choices

Beginning
Ask students simple yes/no questions (e.g., "When I put the ball on top of the box, is the ball in the box?").

Intermediate
Provide students with a specific sentence frames (e.g., "A _____ is above the box when I . . .").

Advanced/Advanced High
Encourage students to use key details in complete sentences (e.g., "My crayons are in the box when I put them inside it.").

ELPS 3.B

Lesson 2: The Earth Inside-Out, Part I

Read-Aloud

30M

Reading: Students will identify the layers of the earth and describe the crust.

TEKS 1.6.G

Language: Students will demonstrate understanding of the Tier 2 word *layer*.

TEKS 1.3.B; TEKS 1.6.E

PURPOSE FOR LISTENING

- Tell students to listen carefully to find out what is inside the earth.

"THE EARTH INSIDE-OUT, PART I" (15 MIN.)

Show Image 2A-1: Gerry digging

Hello! Gerry the Geologist here again. I woke up this morning and started digging this hole in the ground. Each time I push my shovel into the earth, I bring up a load of soil, and I've noticed that each load of soil has a few rocks in it. I am digging this hole today to teach you about the outer **layer** of the earth. *The earth has layers—sort of like a sheet and a blanket are different layers of covers on a bed. What other things have layers?*

Check for Understanding

Vocabulary: What does Gerry study if he is a geologist? *(rocks and what's inside the earth)* What do the parts of the word *geology* mean again? *(*geo *means earth,* –ology *means "the study of.")*

TEKS 1.6.G Evaluate details to determine what is most important with adult assistance; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.6.E** Make connections to personal experiences, ideas in other texts, and society with adult assistance.

Show Image 2A-2: Topsoil and clay

Beneath your backyard, the sidewalk, the school—actually, beneath most every place people live—there is soil, which is sometimes called dirt. Different types of soil appear in the earth in layers. Each layer of soil is made of different things, which can give it a different color or a different texture. *Texture means what something feels like when you touch it.*

The thickness of the soil varies, or is different, depending on where you live. In some places on the earth, the soil is several feet thick. *[Show the depths of "several feet" and then "a few inches" with a ruler or yardstick as you continue reading.]* In other places on the earth it is just a few inches, and in some places on the earth there is no soil at all. Here, where I live, the soil is rich and dark near the surface. However, as I dig deeper into the earth, I can see a definite change in color. *Here, the word* change *means to become or make different.* The color in this soil has changed from dark brown to bright red. That color change means I have reached a layer of reddish clay. It's getting a little harder to dig now, so I'll have to use my pickax.

Show Image 2A-3: Topsoil, clay, and bedrock

Clank! My pick just hit something really hard below the red clay. The farther down I go, the harder the clay becomes. Pretty soon, I will hit bedrock—a solid layer of hard rock that I won't be able to dig through with my shovel. *[Direct students' attention to the model you prepared in a glass jar. Ask them to describe what they see. Be sure to point out where it is easy to see the changes in color and texture between layers.]*

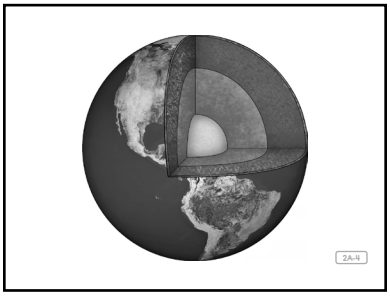
I dug this hole to show you that there are different layers of soil and rock beneath your feet. The farther you go into the earth, the more things change. The dark soil on top is fairly easy to dig into with a shovel, but the deeper layer of clay is harder to dig because it has been compacted—or squished—by the weight or pressure of everything above it. *Remember* pressure *is one of the three words Gerry said we should keep in mind. Pressure, or pushing, from top layers is one reason deeper layers of soil are harder to dig.*

Support

The word *change* also means money in the form of coins, like pennies, nickels, dimes, and quarters. For additional support, refer to Poster 2M in the Flip Book for multiple meanings of *change*.

Challenge

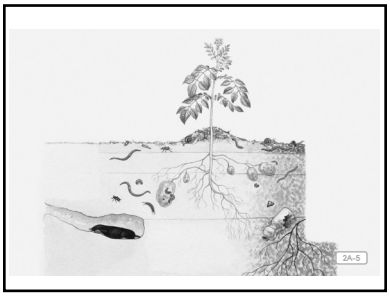
Have several students point to the diagram as they identify each layer of the earth.



Show Image 2A-4: Diagram of the layers of the earth

This diagram shows you what the inside of the earth would look like if you could cut out a big chunk of it. The **crust** is the outermost layer of the earth, represented here by a thin brown line. *[Point to each layer in the diagram as you read about it.]* I have been digging into the very outermost portion of the crust today.

Most of the earth is rock, and most of that rock is beneath the crust in the other three layers: the **mantle** (red), the outer **core** (orange), and the inner core (yellow). The distance from the surface—where you and I live—all the way to the middle of the inner core, is nearly four thousand miles. *[Show students the distance from New York to California on a map.] The distance from the surface to the middle of the inner core is one thousand miles farther than the width of the United States!* This is one thick planet!



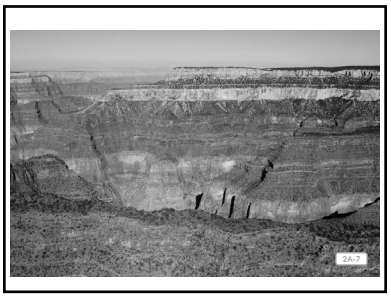
Show Image 2A-5: Earth's crust

I will teach you more about the mantle, outer core, and inner core next time. For now, let's focus on the thinnest layer: the crust. The earth's crust is between three and twenty miles, depending on where you are on earth. *[Fill in the blanks with locations you prepared in advance.] Three miles would be about the distance from here to _____; twenty miles would be about the distance from here to _____.* Most people, plants, and animals live on the surface, or outermost edge, of the crust.

Remember, the earth's surface is covered by oceans and continents. Everything alive on Earth lives in, on, or above these oceans and continents on the crust. For example, you and your dog live on the crust. Worms and moles, on the other hand, live underground, or in the crust. Birds fly in the air above the crust, and fish swim in the water that is flowing on the crust.

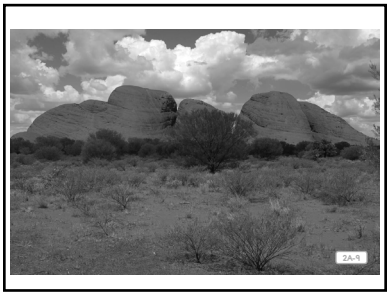
Show Image 2A-6: Layers in the crust
The crust is where geologists like me look to learn about how the surface of the earth changes over time. In the crust, we find different layers of rock, which give us clues on how parts of the earth were formed

Each layer of rock is different, so we can study each layer to learn different things about how our earth works.



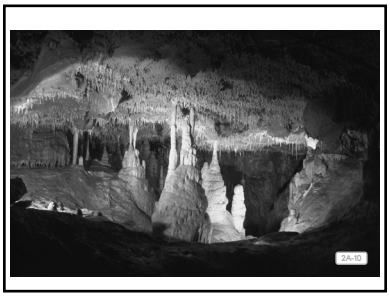
Show Image 2A-7: Grand Canyon
Geologists search the crust for clues about the earth. I already introduced you to this place, called the Grand Canyon. Here, the geology of the earth's crust sits like an open book waiting to be read. "An open book" *is a saying that means something is easy to learn about and understand.* Layer upon layer of different rock tells the geologist when this place was covered with a cool ocean and when it was not. *The Grand Canyon makes it easy for geologists to learn about the earth's crust because all of the layers are visible and easy to see.*

Show Image 2A-8: Arches National Park
Geological or earth changes can do all sorts of tricky things to the rocks on the earth's crust. These formations in Arches National Park, in the state of Utah, show what many years of wind, rain, and ice can do to this type of stone.



Show Image 2A-9: Uluru

Some rocks are mysterious. This is called Uluru [/oo*loo*roo/], or Ayers Rock. It is the only tall thing in an otherwise flat, barren grassland in the middle of Australia. Geologists have figured out that this is a remnant left over from a time when the entire surface there was covered in this type of rock. *A remnant is something left over or remaining.* Eventually, all the other rock **eroded** due to wind and rain, and only this one mound of rock remained. *Wind and rain wore away all the other rock.*



Show Image 2A-10: Cave

Different places tell different stories. Not all interesting rocks are above ground. This photo was taken down in a cave, which is a large hole or space underground. A cave is basically an area in the earth's crust that has been hollowed out for one reason or another, usually as a result of underground water flowing in and dissolving the rock over many years. Caves are really amazing places to explore!

Show Image 2A-11: Gerry with shovel looking at the hole he dug

People usually do not think too much about what is happening underground, deep below our feet, but the fact is that what happens deep underground has everything to do with what we see in the world around us. Next time, we will take a closer look at what's happening in those other layers. I'd better go ahead and fill in this hole now. See you next time!

COMPREHENSION QUESTIONS (10 MIN.)

Flip Book 2A-4

Show Image 2A-4: Diagram of the layers of the earth

1. **Literal.** What is the earth mostly made of? *(rocks)* Where is most of that rock located? *(beneath the crust in the other layers)*
2. **Literal.** [Point to each layer on the diagram as you ask each question.] What is the name of the outermost layer? *(The name of the outermost layer is the crust.)* What is the name of the next layer? *(The name of the next layer is the mantle.)* What is the name of the next layer? *(The name of the next layer is the outer core.)* What is the name of the innermost layer? *(The name of the innermost layer is the inner core.)*
3. **Literal.** Was Gerry digging in the crust, mantle, or core? *(Gerry was digging in the crust.)* On which layer of the earth do we live? *(We live on the crust.)*

Check for Understanding

Use Evidence: Describe the crust of the earth. *(It is the outermost layer of the earth; it has different layers of rock.)*

4. **Literal.** What kinds of things are found in the crust of the earth? *(Soil, rocks, and small animals are found in the crust of the earth.)*
5. **Inferential.** Why do geologists study the layers of rock in the earth's crust? *(Geologists study the layers of rock in the earth's crust to better understand how the earth works and give clues as to how parts of the earth formed.)*

WORD WORK: LAYER (5 MIN.)

1. In the Read-Aloud you heard, "I am digging this hole today to teach you about the outer layer of the earth."
2. Say the word *layer* with me.
3. A *layer* is a part that lies over or under another part. [Quickly review *over* and *under* with students.]
4. I spread a layer of peanut butter on the slice of bread.
5. Have you ever eaten food that had more than one layer? Have you ever worn more than one layer of clothing? Try to use the word *layer* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "I wore a layer of _____ and a layer of _____."]
6. What's the word we've been talking about?

Use a Making Choices activity for follow-up. I will describe two different layers of something. You will decide which layer you prefer. Be sure to use the word *layer* and answer in complete sentences. *(Answers may vary for all.)*

- Would you rather have a layer of mustard or a layer of ketchup on a hamburger?
- Would you rather walk barefoot on a layer of rocks or a layer of grass?
- Would you rather wear one layer or several layers of clothing?
- Would you rather the ground be covered with a layer of snow or a layer of leaves?
- Would you rather dig through a layer of soil or a layer of rock?

EMERGENT BILINGUAL STUDENTS

Language

Supporting Opinions

Beginning
Provide students with a simple sentence frame and a word bank (e.g., "I would rather have _____ because . . ." and words like *like*, *don't like*, *feels good*, *fun*, *easy*, *hard*).

Intermediate
Provide students with an open sentence frame (e.g., "I would rather have . . .").

Advanced/Advanced High
Provide minimal support for open responses and encourage students to use detailed sentences.

ELPS 2.G; ELPS 3.G

Lesson 2: The Earth Inside-Out, Part I

Application

20M

Writing: With assistance, students will dictate or write a friendly letter about the earth's crust. **TEKS 1.3.D; TEKS 1.12.C**

Speaking and Listening: Students will develop social communication. **TEKS 1.1.E**

VOCABULARY INSTRUCTIONAL ACTIVITY (5 MIN.)

Varies

- Tell students in today's Read-Aloud they heard, "The thickness of the soil varies, or is different, depending on where you live."
- Have students say the word *varies* with you.
- Explain that *varies* means changes, or becomes or makes different. Another form of the word *varies* is *vary*.
- Share the following example of the word *vary* in a sentence:
  - The school lunch menu can vary from day to day.
- Have students work with a partner to describe other things that can vary from day to day. Encourage them to use the word *varies* and answer in complete sentences. *(Answers may vary.)*

FRIENDLY LETTER: EARTH'S CRUST (15 MIN.) TEKS 1.1.E

- Remind students that in *Early American Civilizations: Aztecs, Maya, Incas*, they heard a letter Cortés wrote to the king of Spain about his journey.
- Remind students they also learned about the parts of a letter.
- Explain that a friendly letter is a way to share information and keep in touch with someone who is far away from you.
- Direct students' attention to the Letter Format poster you prepared in advance. Explain that students are not expected to be able to read the poster because they are still learning all the rules for decoding. Emphasize that you will read the information to them.

TEKS 1.3.D Identify and use words that name actions, directions, positions, sequences, categories, and locations; **TEKS 1.12.C** Dictate or compose correspondence such as thank you notes or letters; **TEKS 1.1.E** Develop social communication such as introducing himself/herself and others, relating experiences to a classmate, and expressing needs and feelings.

Flip Book 2B-1

- Review the parts of the letter using the following information, pointing to the appropriate part on the poster:
  - greeting: the opening words and often the name of the person or people the letter is to
  - body: all the writer's thoughts
  - closing: the words used to finish the letter
  - signature: the writer's name
- Read the sample letter to students.
- Explain that together, you will write a friendly letter to Gerry the Geologist telling him some of the things you learned about the earth's crust.
- As an alternative option, ask students to dictate the letter as you write it.

Show Image 2B-1: Earth's crust

- Give students time to examine the image.
- Review the concepts of in, on, and above with students. Remind them of the activity they did earlier in the day with the ball and the box.

Check for Understanding

Point to It: Which part of the image is the crust? *(Students should point to the layer from which the grass is growing.)*

- Ask students to identify what things in the image are in, on, and above the crust. *(in: soil, roots; on: grass, dog, tree; above: birds)*
- Next, have students brainstorm other things that are in, on, and above the crust. Record student responses in the appropriate places on the In/On/Above chart. *(Answers may vary.)*
- Tell students now you will work together to write a letter to Gerry the Geologist about things in, on, and above the crust.
- Explain that because you are writing a letter to Gerry the Geologist, the greeting is *Dear Gerry,*. Write the greeting on the board or chart paper.
- Referencing the list you created together about things that are in the crust, have students help you create an opening sentence (e.g., *You helped us learn that things in the crust include soil, rocks, and roots.*).

EMERGENT BILINGUAL STUDENTS

Speaking and Listening

Exchanging Information and Ideas

Beginning
Ask students simple yes/no questions (e.g., "Are houses in the crust?").

Intermediate
Provide students with a specific sentence frame (e.g., ". . . are on the crust.").

Advanced/Advanced High
Encourage students to use key details in complete sentences (e.g., "Houses are on the crust because they sit on top of it, not in or above it.").

ELPS 2.G; ELPS 3.C

Challenge

Have students who are ready write a letter independently or with a partner.

- Record the sentence under the greeting.
- Referencing the list you created together about things that are on the crust, have students help you create a sentence (e.g., *We learned that things on the crust include people, animals, cars, and our school.*).
- Record the sentence after the first sentence you wrote.
- Referencing the list you created together about things that are above the crust, have students help you create a sentence (e.g., *We learned that things above the crust include birds, clouds, and the sky.*).
- Record the sentence after the second sentence you wrote.
- Tell students you want to end by thanking Gerry for helping you learn about the earth's crust. You may wish to end the letter with a simple *Thank you!* or a more detailed sentence (e.g., *Thanks for helping us learn about the earth's crust!)*.
- Sign the letter as *(Insert your name)'s First Grade Class*.
- Read the entire letter aloud to the class.

Exit Pass

Give each student an index card. Tell them you will name three things and they have to identify if each thing is in, on, or above the crust.

Have students write the numbers 1, 2, and 3 under each other in a column on their index cards.

For something in the crust, students should write the word *in*. For something on the crust, students should write the word *on*. For something above the crust, students should write the letter *A*.

Read the following to students and give them time to record their answers:

- clouds
- soil
- a playground

End Lesson

Support

Have students dictate sentences to an adult to complete their letter.

LESSON

3

THIS PLANET ROCKS

The Earth Inside-Out, Part II

PRIMARY FOCUS OF LESSON

Speaking and Listening

Students will identify the difference between things that are solid, liquid, and gas.

TEKS 1.1.C; TEKS 1.3.D

Reading

Students will describe the mantle and the core of the earth.

TEKS 1.3.B; TEKS 1.6.G

Language

Students will demonstrate understanding of the Tier 3 word *solid*.

TEKS 1.3.B; TEKS 1.3.D

Reading

Students will identify and differentiate between the layers of the earth.

TEKS 1.3.B; TEKS 1.7.B

FORMATIVE ASSESSMENT

Activity Page 3.1

Layers of the Earth Students will color-code and label the layers of the earth.

TEKS 1.3.B

TEKS 1.1.C Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.3.D** Identify and use words that name actions, directions, positions, sequences, categories, and locations; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.6.G** Evaluate details to determine what is most important with adult assistance; **TEKS 1.7.B** Write brief comments on literary or informational texts.

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud (10 min.)			
What Have We Already Learned?	Whole Group	10 min.	❏ globe ❏ Flip Book: 3A-1 ❏ two clear containers with different shapes ❏ water
Essential Background Information and Terms			
Read-Aloud (30 min.)			
Purpose for Listening	Whole Group	30 min.	❏ Flip Book: 3A-1–3A-4 ❏ U.S. map
"The Earth Inside-Out, Part II"			
Comprehension Questions			
Word Work: *Solid*			
This is a good opportunity to take a break.			
Application (20 min.)			
Syntactic Awareness Activity	Whole Group/ Independent	20 min.	❏ Activity Page 3.1 ❏ drawing tools ❏ scissors ❏ glue
Layers of the Earth			

ADVANCE PREPARATION

Introducing the Read-Aloud

- Gather two clear containers with different shapes. Put water in one of them.

Note to Teacher

The purpose of the syntactic awareness activity is to help students understand the direct connection between grammatical structures and the meaning of text. This syntactic awareness activity should be used in conjunction with the complex text presented in the Read-Alouds.

Universal Access

- You may wish to bring in a jar of molasses and a spoon to demonstrate the word *gooey*.

Note: Be sure to check your school's policy regarding food distribution and allergies.

CORE VOCABULARY

erupts, v. sends out lava, ash, and gas in a sudden explosion
Example: When a volcano erupts, it is a sudden explosion that sends out lava, ash, and gas.
Variation(s): erupt, erupted, erupting

liquid, adj. does not keep its shape and instead takes the shape of its container
Example: There is liquid rock deep inside the earth.
Variation(s): liquid, **n.**

molten, adj. melted
Example: It takes very high temperatures to melt metals into molten forms.
Variation(s): none

solid, adj. keeps its shape; hard
Example: They put the water in the freezer so it would become solid ice.
Variation(s): solid, **n.**

volcano, n. a mountain that forms over a crack in the earth's crust, from which lava, ash, and gas erupts
Example: In order to study the volcano, the scientists had to climb from the bottom of the volcano to the very top.
Variation(s): volcanoes

Vocabulary Chart for "The Earth Inside-Out, Part II"

Type	Tier 3 Unit-Specific Words	Tier 2 General Academic Words	Tier 1 Everyday Speech Words
Vocabulary	erupts liquid (*liquido*) molten solid (*sólido*) volcano (*volcán*)		
Multiple-Meaning			
Sayings and Phrases			

Lesson 3: The Earth Inside-Out, Part II

Introducing the Read-Aloud

10M

Speaking and Listening: Students will identify the difference between things that are solid, liquid, and gas.

TEKS 1.1.C; TEKS 1.3.D

WHAT HAVE WE ALREADY LEARNED? (5 MIN.)

Flip Book 3A-1

- Using the globe, remind students that the land on the surface of the crust is called continents and the water is called oceans.
- Have students assist you in locating the North Pole, the South Pole, and the equator.

Show Image 3A-1: Diagram of the layers of the earth

- Ask students to name the layers of the earth using the diagram. *(crust, mantle, outer core, and inner core)*

Check for Understanding

One-Word Answer: Which layer is the one where we live? *(crust)*

- Remind students that the crust is where geologists look to learn about how the surface of the earth changes over time. The many layers of rock found in the crust can give us clues about how parts of the earth were formed.
- Ask students to clap three times and chant the three important words that Gerry the Geologist said to remember when studying geology. *(Heat! Pressure! Time!)*
- Ask students why heat, pressure, and time are important when studying geology. *(They cause many changes to the earth.)*

TEKS 1.1.C Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.3.D** Identify and use words that name actions, directions, positions, sequences, categories, and locations.

ESSENTIAL BACKGROUND INFORMATION AND TERMS (5 MIN.)

- Explain that all things on Earth can be described as being solid, liquid, or gas.
- Explain that if something is solid, it keeps its shape.
- Tell students that if you pick up a book and hand it to someone else, it will still keep its same shape. It keeps its shape because the book is solid.
- Ask students for examples of other things that are solid, or that keep their shape. *(Answers may vary.)*
- Explain that if something is liquid, it can be poured. It doesn't keep its shape, but takes on the shape of its container.
- Show students two clear containers with different shapes. Have students watch as you pour water from one container to another.
- Tell students that water is liquid because it takes the shape of whatever container it is in.
- Ask students for examples of other things that are liquid, or that take the shape of whatever container they are in. *(Answers may vary.)*
- Explain that if something is gas, it is often hard to see.
- Explain that the air around us is gas. It is not solid because it does not keep its shape, and it is not liquid because it cannot be poured.
- Ask students for examples of other things that are gas. [This may be difficult for students to answer.] *(Answers may vary. Some students may have heard of oxygen and carbon dioxide.)*
- Explain that heat can change things from solid to liquid to gas.
- Tell students that an ice cube is the solid form of water. When heated, an ice cube can melt and become water, which is liquid. When water is boiled, it heats up and becomes water vapor, which is a gas.
- In pairs, have students name examples of one or more solid, liquid, and gas.

EMERGENT BILINGUAL STUDENTS

Language

Selecting Language Resources

Beginning
Reframe open-ended questions as simple yes/no questions (e.g., "Is lemonade a gas?").

Intermediate
Provide students with a specific sentence frame (e.g., "_____ is a liquid because . . .").

Advanced/Advanced High
Encourage students to use key details in complete sentences (e.g., "Tea is a liquid because it takes the shape of the container it is in.").

ELPS 1.F; ELPS 2.G

Lesson 3: The Earth Inside-Out, Part II

Read-Aloud

30M

Reading: Students will describe the mantle and the core of the earth.

TEKS 1.3.B; TEKS 1.6.G

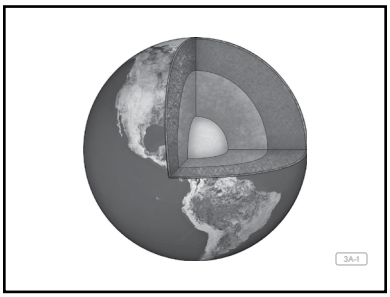
Language: Students will demonstrate understanding of the Tier 3 word *solid*.

TEKS 1.3.B; TEKS 1.3.D

PURPOSE FOR LISTENING

- Explain to students that in today's Read-Aloud they will hear that inside the earth there are solids and liquids.
- Tell students to listen carefully to find out more from Gerry the Geologist about the other layers of the earth: the mantle and core.

"THE EARTH INSIDE-OUT, PART II" (15 MIN.)



Show Image 3A-1: Diagram of the layers of the earth

[Point to the layers in the diagram as they are named in the Read-Aloud.]

Today, we are going to pretend that we can journey deep, deep into the earth, all the way to the very center, nearly four thousand miles from where you are sitting right now.

The first stop is the layer beneath the crust, which is called the mantle. The mantle is a whopping 1,800 miles thick and contains most of the earth's rock. *[Show students the distance from New York to Colorado on a map and tell them that it is roughly the thickness of the mantle.]* Because most of the earth is made of rock, that means that most of the earth is contained within the mantle.

TEKS 1.3.B Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.6.G** Evaluate details to determine what is most important with adult assistance; **TEKS 1.3.D** Identify and use words that name actions, directions, positions, sequences, categories, and locations.

The mantle is mostly made of **solid** rock. The closer to the crust, the cooler and harder the mantle tends to be. But as you go deeper, closer to the core, the mantle gets hotter and becomes soft and gooey. Heat closer to the core causes the rock inside the mantle to move around quite a bit. But in most places, it is still solid rather than **liquid**. *Did you hear the word* heat *again? Heat causes parts of the mantle to move around. Remember, something that is solid keeps its shape, while something that is liquid can move around and take the shape of whatever it is in.*

The mantle surrounds the core, or center, of the earth. The core has two parts: the inner core and the outer core. The inner core is a solid metal ball. The outer core is also metal, but it is not solid—it is made up of melted, or **molten**, metal. *If metal is molten, heat has changed it from solid to liquid.* This means that deep down inside the earth—thousands of miles beneath your feet—there is a giant sea of red-hot, molten metal surrounding a solid metal ball.

Check for Understanding

Making Connections: What does it mean if the inner core is solid? *(The inner core does not change shape.)*

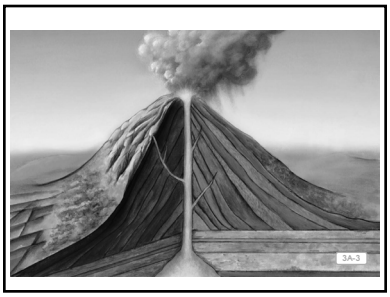
Scientists estimate that the very center of the earth—the inner core—is actually hotter than the surface of the sun, which is a blazing 10,000 °F! *A really hot day in the United States is about 100 °F, so 10,000 °F is extremely hot! [Write out the two numbers so that students can see just how much bigger 10,000 is, compared to 100.]* The inner core is much hotter than the outer core. It may seem strange, therefore, that the outer core of the earth is molten metal, yet the inner core—at the very center of the earth where it is hottest—is a solid ball of metal, which, by the way, is just a bit smaller than the moon!

The reason that the inner core is solid has to do with the incredible pressure of the earth's entire weight pressing inward. The more pressure you put on something, the more heat you need to cause that thing to boil or melt. This is why the metal at the very center of the earth—the inner core—is solid instead of liquid. Despite the intense heat, there is simply too much pressure caused by the weight of the rest of the earth, so the center of the earth cannot melt, and it remains solid. *Did you hear the word* pressure *again? Pressure causes the inner core to be solid rather than liquid.*

Challenge

Ask students how the temperature of the earth's layers changes as you travel deeper into the earth.

Show Image 3A-2: San Bernardino Mountains
The crust upon which we live is constantly being changed and reshaped due to heat and pressure caused by activity in the earth's mantle and core. *Did you hear the words* heat *and* pressure *again? Heat and pressure in the earth's mantle change the earth's crust.* The San Bernardino Mountains that you see in this picture, along with many other mountains along the West Coast of North America, from Mexico to Alaska, were created by changes inside the earth.



Show Image 3A-3: Diagram of a volcano
Remember, the parts of the mantle that are closest to the core are soft and gooey. That hot, gooey material in the mantle does not always stay in the mantle. Sometimes it rises up to the surface. Every so often, some of that extremely hot molten rock, or magma, pushes up through the mantle and forces its way into cracks and crevices in the crust.

Over time, the magma collects in a magma chamber, such as the one near the bottom of the picture. The heat in the magma chamber releases gas from the magma, which builds up and creates pressure. The pressure builds and builds until . . . one day . . . BOOM! *Did you hear the words* heat *and* pressure *again? Heat and pressure cause volcanoes to erupt.* The magma **erupts** in a **volcano** of lava, ash, and gas. Once it is released from the earth, the magma becomes lava—flowing liquid rock, which flows across the ground until it cools and hardens into solid rock once again. *The eruption of lava, ash, and gas forms a volcano.*

Support

You may wish to explain that magma is molten rock that is deep inside the mantle and lava is magma that has come out onto the earth's surface. Students will learn more about these terms in the next Read-Aloud.

Show Image 3A-4: Volcano

What do you see in this picture?

Now that I have told you about volcanoes, let me explain one more thing. Thanks to geologists, we have a pretty good idea when and where these geologic events are likely to occur. Geologists help predict where volcanoes are most likely to occur, and this helps keep people safe by discouraging them from building homes close to dangerous areas. It is not always possible to predict when and where geologic disasters will occur, but geologists work hard to give people as much warning as we can. *Disasters are sudden events that cause a lot of damage.*

COMPREHENSION QUESTIONS (10 MIN.)

1. **Literal.** What are the names of the layers of the earth? *(The names of the layers of the earth are the crust, mantle, outer core, and inner core.)*
2. **Literal.** Describe the mantle. *(The mantle contains most of the earth's rock; it gets hotter and softer closer to the core.)*
3. **Literal.** Describe the outer core. *(The outer core of the earth is molten metal.)* Describe the inner core. *(The inner core is a solid metal ball.)*
   - **Inferential.** Why is the inner core solid rather than liquid? *(The inner core is solid rather than liquid because there is too much pressure from the weight of the rest of the earth to allow the inner core to melt.)*
4. **Literal.** What causes a volcano to form? *(Magma inside the earth makes its way to the surface of the earth and causes a volcano to form.)*
   - **Inferential.** Why is it important for scientists to study volcanoes? *(It is important for scientists to study volcanoes so they can learn more about them and help keep people safe from geological disasters.)*

Check for Understanding

Think-Pair-Share: How are the crust, mantle, and core of the earth alike? *(They are all layers of the earth.)* How are they different? *(The crust, mantle, and core are different because some parts are solid and some parts are liquid. The crust, mantle, and core are also different because some parts are hotter than others.)*

EMERGENT BILINGUAL STUDENTS

Reading

Reading/Viewing Closely

Beginning
Prompt and support students to recall words and phrases that relate to each layer of the earth.

Intermediate
Provide moderate support in eliciting phrases and ideas with greater detail that relate to each layer of the earth.

Advanced/Advanced High
Provide minimal support in eliciting key details related to each layer of the earth.

ELPS 4.G; ELPS 4.I

WORD WORK: SOLID (5 MIN.)

1. In the Read-Aloud you heard, "Heat closer to the core causes the rock inside the mantle to move around quite a bit. But in most places, it is still solid rather than liquid."
2. Say the word *solid* with me.
3. If something is *solid*, it keeps its shape.
4. It was so cold outside last night that the water puddle became solid ice.
5. What things have you seen that are solid? Try to use the word *solid* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "_____ is solid."]
6. What's the word we've been talking about?

Use a Making Choices activity for follow-up. I will name an object. If it is something that is solid, say, "That is solid." If it is something that is not solid, say, "That is not solid."

- book *(That is solid.)*
- milk *(That is not solid.)*
- water *(That is not solid.)*
- desk *(That is solid.)*
- shoe *(That is solid.)*
- steam coming out of a hot bowl of soup *(That is not solid.)*

Lesson 3: The Earth Inside-Out, Part II

Application

20M

Reading: Students will identify and differentiate between the layers of the earth.

TEKS 1.3.B; TEKS 1.7.B

SYNTACTIC AWARENESS ACTIVITY (5 MIN.)

Conjunction *And*

- Explain that a conjunction is a kind of word used to connect words and phrases.
- Explain that the conjunction ***and*** is used to join words and phrases that share similar ideas, or ideas that are alike.
- Read aloud the following excerpt from the Read-Aloud about one of the earth's layers. Note that you will emphasize the word ***and*** as you read:

  The first stop is the layer beneath the crust, which is called the mantle. The mantle is a whopping 1,800 miles thick ***and*** *contains most of the earth's rock . . . The closer to the crust, the cooler* ***and*** *harder the mantle tends to be. But as you go deeper, closer to the core, the mantle gets hotter* ***and*** *becomes soft* ***and*** *gooey.*

- Note that in this excerpt, Gerry the Geologist uses the word ***and*** when he talks about two facts or ideas that are both about the mantle. The word ***and*** helps him to not repeat the word *mantle* over and over again.
- Read the following sentences aloud to students:
  - David plays soccer.
  - David plays basketball.
- Explain that these sentences can be combined using the word ***and***.
  - David plays soccer ***and*** basketball.
- Note that because David plays both sports, you do not have to say "David plays" twice and can just use the word ***and***.
- Read the following sentences aloud to students:
  - I have milk after school.
  - I have cookies after school.
- Ask students how these sentences can be combined using the word ***and***. *(I have milk and cookies after school.)*

TEKS 1.3.B Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.7.B** Write brief comments on literary or informational texts.

Support

There may be variations in the sentences created by your class. Allow for these variations and restate students' sentences so that they are grammatically correct.

- Ask students why the word ***and*** can be used. (Because I have both things after school, I don't have to say "I have" twice and can just use the word ***and***.)
- With a partner, have students discuss two things they will do after school today, using the word ***and***. Remind students to answer in complete sentences.
- Call on a few pairs to share their sentences. *(Answers may vary.)*

Check for Understanding

Recall: What is the conjunction *and* used for? *(to join words and phrases that are similar)*

LAYERS OF THE EARTH (15 MIN.)

- Have students turn to Activity Page 3.1.
- Explain that the activity page has a diagram of the layers of the earth.
- Have students point to and name the crust on the diagram. Then have students color the crust brown.
- Have students point to and name the mantle on the diagram. Then have students color the mantle red.
- Have students point to and name the outer core on the diagram. Then have students color the outer core orange.
- Have students point to and name the inner core on the diagram. Then have students color the inner core yellow.
- Ask students the following questions about the earth's layers:
  - Which layer is the hottest? *(inner core)*
  - Which layer is where we live? *(crust)*
  - Which layer is cooler near the crust and hotter near the core? *(the mantle)*
- Have students cut out the layer labels on the activity page and glue them in the appropriate places to label the diagram.
- Then, have students turn the activity page over and write two sentences about two of the earth's layers.

End Lesson

Activity Page 3.1

Support

Have students dictate their sentences or work in pairs to create sentences.

Challenge

Have students write a sentence about each of the four layers in the diagram.

EMERGENT BILINGUAL STUDENTS

Writing

Writing

Beginning
Have students describe the earth's layers using phrases and familiar vocabulary.

Intermediate
Have students describe the earth's layers using short sentences.

Advanced/Advanced High
Have students describe the earth's layers using longer, more detailed sentences.

ELPS 5.F

LESSON

4

THIS PLANET ROCKS

The Earth Inside-Out, Part III

PRIMARY FOCUS OF LESSON

Speaking and Listening

Students will distinguish between magma and lava.

TEKS 1.1.A

Reading

Students will describe volcanoes and geysers.

TEKS 1.6.G

Language

Students will demonstrate understanding of the Tier 2 word *destructive*.

TEKS 1.3.B

Reading

With assistance, students will identify similarities and differences between volcanoes and geysers.

TEKS 1.1.C; TEKS 1.6.H

FORMATIVE ASSESSMENT

Activity Page 4.1

Venn Diagram Students will compare and contrast volcanoes and geysers.

TEKS 1.1.C; TEKS 1.6.H

TEKS 1.1.A Listen actively, ask relevant questions to clarify information, and answer questions using multi-word responses; **TEKS 1.6.G** Evaluate details to determine what is most important with adult assistance; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.1.C** Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.6.H** Synthesize information to create new understanding with adult assistance.

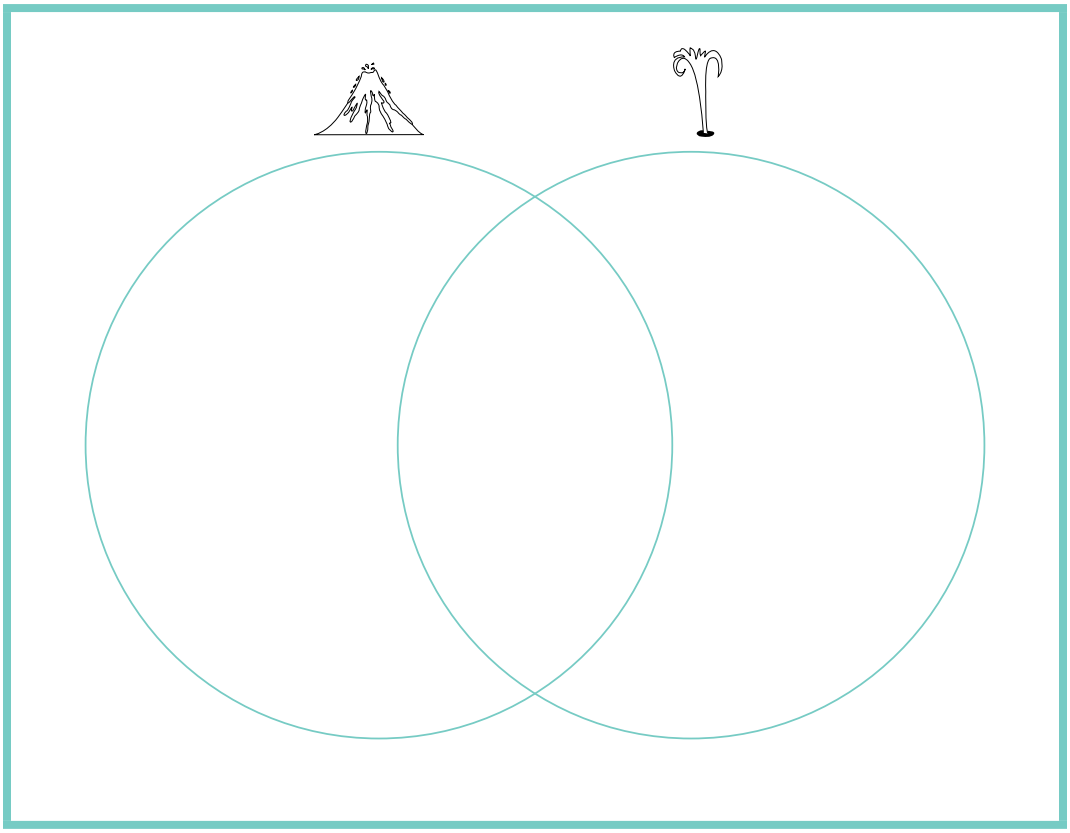
LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud (10 min.)			
What Have We Already Learned?	Whole Group	10 min.	❏ Flip Book: 3A-1, 4A-1
Essential Background Information and Terms			
Read-Aloud (30 min.)			
Purpose for Listening	Whole Group	30 min.	❏ Flip Book: 4A-2–4A-12 ❏ globe ❏ U.S. map
"The Earth Inside-Out, Part III"			
Comprehension Questions			
Word Work: *Destructive*			
This is a good opportunity to take a break.			
Application (20 min.)			
Venn Diagram	Whole Group/ Small Group	20 min.	❏ Venn Diagram (Digital Components) ❏ Activity Page 4.1

ADVANCE PREPARATION

Application

- Prepare a two-circle Venn diagram and label the left circle with a drawing of a volcano and the right circle with a drawing of a geyser (see example below). Alternatively, you can access a digital version in the online materials for the unit.



- Prepare to divide students into small groups of three or four.

Note to Teacher

The geyser, Old Faithful, erupts every 35 to 120 minutes. You might want to have students work on another activity while they wait to view an eruption via webcam. Another option is to watch archived videos of past eruptions of Old Faithful.

Universal Access

- You may wish to gather additional images of volcanoes and geysers to share with students.

CORE VOCABULARY

destructive, adj. causing damage
Example: He was a very destructive puppy and often ate through shoes and slippers.
Variation(s): none

geysers, n. places on the earth where hot water and steam shoot up from inside the earth onto its surface
Example: Many people travel to see the geysers in Yellowstone National Park.
Variation(s): geyser

lava, n. magma that has come out onto the earth's surface
Example: After the lava rushed down the mountainside, it began to cool and harden.
Variation(s): none

magma, n. molten rock that is deep inside the mantle of the earth
Example: The hot magma slowly made its way to the earth's crust.
Variation(s): none

Vocabulary Chart for "The Earth Inside-Out, Part III"

Type	**Tier 3** **Unit-Specific Words**	**Tier 2** **General Academic Words**	**Tier 1** **Everyday Speech Words**
Vocabulary	geysers lava (*lava*) magma	destructive (*destructivo/a*)	
Multiple-Meaning			
Sayings and Phrases	give or take a few		

Lesson 4: The Earth Inside-Out, Part III

Introducing the Read-Aloud

10M

Speaking and Listening: Students will distinguish between magma and lava.

TEKS 1.1.A

WHAT HAVE WE ALREADY LEARNED? (5 MIN.)

Show Image 3A-1: Diagram of the earth's layers

Check for Understanding

Point and Say It: Name the earth's layers using the diagram. *(crust, mantle, outer core, inner core)*

- Remind students that heat causes magma to move around in the mantle, and sometimes rise up through the surface of the crust.
- Ask students what happens when magma rises up through cracks in the crust. *(It creates a volcano.)*

Show Image 4A-1: Volcano

- Ask students to describe what they see in this image. *(Answers may vary but may include lava, rock, volcano, steam, mountains.)*
- Ask students to chant and clap three times the three important words that Gerry the Geologist said to remember when studying geology. *(Heat! Pressure! Time!)*
- Ask students why heat, pressure, and time are important when studying geology. *(They cause many changes to the earth.)*

Flip Book 3A-1, 4A-1

EMERGENT BILINGUAL STUDENTS

Language

Selecting Language Resources

Beginning
Provide students with an oral word bank (e.g., *lava*, *volcano*, *rock*, *steam*).

Intermediate
Provide students with a specific sentence frame (e.g., "In this image, I see . . .").

Advanced/Advanced High
Encourage students to use key details in complete sentences (e.g., "In this image, I see lava erupting out of a volcano and flowing down the mountainside, letting off steam further down.").

ELPS 1.F

TEKS 1.1.A Listen actively, ask relevant questions to clarify information, and answer questions using multi-word responses.

ESSENTIAL BACKGROUND INFORMATION AND TERMS (5 MIN.)

- Point out that students heard the terms *magma* and *lava* in the previous Read-Aloud. Note that is important to understand the difference between the two.
- Explain that *magma* is molten rock that is deep inside the mantle. Heat and pressure cause it to move. When the pressure is too much, the magma is forced out onto the earth's surface.
- Explain that *lava* is magma that has come out onto the earth's surface. When magma is forced up through cracks in the earth's crust and erupts out onto the surface, it is called *lava*.

Show Image 4A-1: Volcano

- Point out that lava is red-orange material that can be seen in this image, coming out of the volcano.
- Call on several students to explain the difference between magma and lava. *(Magma is molten rock beneath the surface of the earth; lava is molten rock or magma that has erupted out onto the earth's surface.)*

Lesson 4: The Earth Inside-Out, Part III

Read-Aloud

30M

Reading: Students will describe volcanoes and geysers.

TEKS 1.6.G

Language: Students will demonstrate understanding of the Tier 2 word *destructive*.

TEKS 1.3.B

PURPOSE FOR LISTENING

- Tell students to listen carefully to learn more about volcanoes and to learn about geysers.

"THE EARTH INSIDE-OUT, PART III" (15 MIN.)

Show Image 4A-2: Hawaii

Ah, Hawaii. I just love this place. The land is beautiful, the people are friendly, the weather is perfect, and the surfing is terrific. Personally, however, my favorite part of Hawaii is the volcanoes. If you like volcanoes—and all geologists do—then there is really no better place than Hawaii!

When most people think of volcanoes, they think of the top blowing off a mountain and **lava** flowing out everywhere. *Lava is magma or molten rock that has come out onto the earth's surface.* Volcanic activity actually comes in many different forms, not all of which are as spectacular as a mountaintop eruption *or explosion*.

Show Image 4A-3: World map with Hawaii circled

[Show students where Hawaii is located on a globe.]

Hawaii is made up of eight major islands, seven of which are inhabited. *If a place is inhabited, that means people live there.*

TEKS 1.6.G Evaluate details to determine what is most important with adult assistance; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings.

The islands of Hawaii were formed by volcanic activity. In other words, if it weren't for volcanoes, Hawaii would not be there at all.

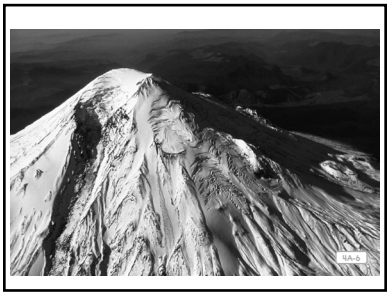
Show Image 4A-4: Island volcano
Hawaii is one of the best known volcanic hot spots in the whole world. A hot spot is a place where there has been continuous volcanic activity for a long time. *Why do you think it's called a hot spot?* In Hawaii's case, the volcanic activity started underwater. In fact, most volcanic activity occurs underwater, deep down near the ocean floor. Down there, the crust is fairly thin, so it's easier for **magma** to seep up from the mantle. *Magma is molten rock that is deep inside the mantle of the earth. What is it called once it comes out onto the earth's surface? (lava)*

When a volcano erupts underwater, the lava it releases cools very quickly. Over time this lava piles up. *Did you hear the word* time*? It takes a very long time for lava to pile up into mountains.* That is what happened in Hawaii. Over time, the lava continually erupting from the hot spot built up a pile that now reaches from the deep ocean floor all the way to the ocean surface, where it became new, dry land.

Check for Understanding

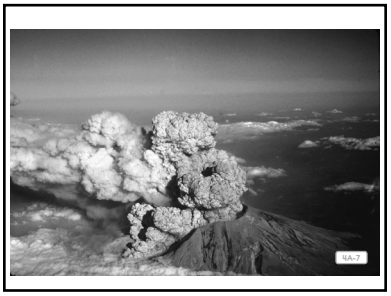
Use Evidence: How did Hawaii form? *(Over time, lava continually erupted from a hot spot. The lava built up in a pile as it cooled. The pile reached from the deep ocean floor all the way to the ocean surface, where it became new, dry land.)*

Show Image 4A-5: Volcanoes National Park
Hawaiian volcanoes erupt gradually, or little by little. The lava bubbles and gurgles and sputters rather than shooting up out of the earth all at once. There is still plenty of volcanic activity on some Hawaiian islands, which means the island chain is still growing.



Show Image 4A-6: Mount St. Helens prior to eruption

Now let's compare the Hawaiian volcano to another type of volcano—the kind where a mountaintop explodes! This volcano erupted in the state of Washington, which is on the West Coast of the United States. *[Point out the state of Washington on a U.S. map.]* This is what Mount St. Helens looked like until the year 1980. Mount St. Helens proves that it is generally fairly easy to predict where a volcano will erupt; the hard part is figuring out when.



Show Image 4A-7: Eruption of Mount St. Helens

Mount St. Helens has erupted many times over the course of 40,000 or so years, and during this time the mountain's size and shape has changed. Magma is constantly building up within Mount St. Helens. Unlike the magma in the Hawaiian volcanoes, however, the magma in this area is much stickier, so it does not gurgle and sputter through little vents. Instead, the magma gets stuck, and incredible pressure builds up within the mountain. Eventually, the pressure becomes so intense that the mountain cannot hold it anymore, and . . . BOOM! *Did you hear the word* pressure*? Pressure caused the volcano to erupt.*

The eruption of Mount St. Helens was the most **destructive** volcanic eruption in U.S. history. *The word* destructive *means causing damage.* Hundreds of homes were destroyed and thousands of acres of forest were leveled, *or flattened*, when this mighty volcano erupted. In an instant, the top and one side of the mountain were literally blown away. Lava was not the main problem with Mount St. Helens. Rather, it was the immense amount of rock and ash that exploded into the air, as well as the landslides that followed, as the mountain came crashing down into the valley below.

Challenge

Have students identify similarities and differences between a Hawaiian volcano and Mount St. Helens.

Show Image 4A-8: Mount St. Helens today
This is what Mount St. Helens looks like today. It's still tall enough to rise above the clouds, but if you compare this to the first picture you saw, you can see that it is not the same mountain it used to be. *[Turn back to Image 4A-6 to remind students of what Mount St. Helens looked liked before the destructive eruption.]* Mount St. Helens has erupted several more times after that day in 1980, and it still erupts occasionally to this day.

Show Image 4A-9: Yellowstone Caldera
Here is another place in the United States where there is lots of volcanic activity. This place is called Yellowstone National Park. Yellowstone is mostly in Wyoming, with parts of it extending into Idaho and Montana. Yellowstone National Park is home to many interesting and beautiful sites. *[Point out Wyoming, Idaho, and Montana on a U.S. map.]* Like Hawaii, Yellowstone is situated on top of a hot spot, a place where there is lots of magma close to the surface. In Yellowstone, the magma has stayed underground and has not erupted onto the surface.

Show Image 4A-10: Hot springs and geysers
Yellowstone is famous for its **geysers**. A geyser is a rare geologic event that occurs when water seeps down through cracks into the crust and meets up with hot rocks. When the water touches the hot rocks, it turns into steam. *Heat causes the liquid water to become a gas called steam, like the steam that comes out of a hot bowl of soup.* As more water seeps in, more steam is created, and pressure begins to build. Eventually, all this heat and pressure force the steam to find a way back out. *Did you hear the words* heat *and* pressure*? Heat and pressure cause geysers to erupt.* As in other types of volcanic activity that you have learned about, this process is caused by the build-up and release of pressure underground.

The result is a geyser—steam and water spewing up out of the earth. *Lava spews out of a volcano. What spews out of a geyser?* These particular geysers are relatively small. They spurt and bubble all day long in water pools, or springs, which have a pretty, bluish-green color created by certain minerals that collect there.

Show Image 4A-11: Old Faithful

This geyser has a name: it's called Old Faithful. The word *faithful* means trustworthy or reliable. *Why do you think the geyser might be called Old Faithful? What does it mean to be reliable?* Old Faithful got its name because you can count on the fact that it is going to erupt several times each day. It is not possible to predict exactly when it will erupt, but it typically erupts about every ninety minutes, give or take a few.

Old Faithful spews out steam and hot water for anywhere from one to five minutes. It can spew as much as 8,000 gallons of water up to 185 feet in the air. Every day during the summer, when the park is full of visitors, hundreds of people gather around to watch the world's most famous geyser.

Show Image 4A-12: Volcano

Although they come in many forms, shapes, and sizes, all volcanoes and geysers have two things in common: they are the earth's way of releasing heat and pressure from deep underground, and each one tells us a little more about the earth. And one other thing: all volcanoes and geysers are extremely hot, so always keep a safe distance and admire them from afar!

COMPREHENSION QUESTIONS (10 MIN.)

1. **Literal.** How did volcanoes form the islands of Hawaii? *(Underwater volcanoes erupted and the lava built up piles over time. The piles reached from the ocean floor all the way to the ocean surface, where they became new, dry land.)*
2. **Evaluative.** How are lava and magma similar? *(They are both molten rock.)* How are they different? *(Lava is magma that has erupted out onto the earth's surface. Magma is molten rock deep inside the mantle.)*
3. **Literal.** What is a geyser? *(A geyser is a place where steam and hot water erupt from the earth.)*
   - **Literal.** What is Old Faithful? *(Old Faithful is a well-known geyser in Yellowstone National Park.)* How did Old Faithful get its name? *(You can be sure it is going to erupt several times each day.)*
4. **Literal.** What is a hot spot? *(A hot spot is a place where there is lots of volcanic activity.)*
5. **Evaluative.** How is a volcano like a geyser? *(Volcanoes and geysers are both eruptions caused by heat and pressure inside the earth, and they are both over hot spots.)* How are they different? *(They are different because a volcano is an eruption of lava, ash, and gas, whereas a geyser is an eruption of steam and hot water.)*

WORD WORK: DESTRUCTIVE (5 MIN.)

1. In the Read-Aloud you heard, "The eruption of Mount St. Helens was the most destructive volcanic eruption in U.S. history."
2. Say the word *destructive* with me.
3. *Destructive* means causing damage.
4. The destructive hurricane tore trees from the ground.
5. Have you observed events in nature that were destructive? Try to use the word *destructive* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "The _____ was very destructive."]
6. What's the word we've been talking about?

EMERGENT BILINGUAL STUDENTS

Reading

Reading/Viewing Closely

Beginning
Prompt students to recall words and phrases related to volcanoes and geysers.

Intermediate
Provide moderate support in eliciting phrases and ideas related to volcanoes and geysers.

Advanced/Advanced High
Provide minimal support in eliciting key details related to volcanoes and geysers.

ELPS 4.G

Use a Making Choices activity for follow-up. I will describe a situation. If I describe something that is destructive, say, "That's destructive." If I describe something that is not destructive, say, "That's not destructive."

- The forest fire burned the homes of many animals. *(That's destructive.)*
- The winds of the hurricane blew a tree onto my neighbor's car. *(That's destructive.)*
- We saw a beautiful rainbow after the thunderstorm. *(That's not destructive.)*
- The tornado blew the roof off the grocery store. *(That's destructive.)*
- The grass changed from brown to green after the spring rains. *(That's not destructive.)*

Lesson 4: The Earth Inside-Out, Part III

Application

20M

Reading: With assistance, students will identify similarities and differences between volcanoes and geysers.

TEKS 1.1.C; TEKS 1.6.H

VENN DIAGRAM (20 MIN.)

Activity Page 4.1

- Direct students' attention to the Venn diagram you prepared in advance and have them turn to Activity Page 4.1.
- Review what a Venn diagram is and how to use it. *(A Venn diagram helps identify how things are similar and different. The place where the circles overlap shows how the two things are similar. The places where the circles do not overlap show how the two things are different.)*
- Tell students you will use the Venn diagram to compare and contrast volcanoes and geysers.

Check for Understanding

Recall: How are volcanoes and geysers similar? *(Both are over hot spots; both have eruptions; both are caused by heat and pressure.)*

- Record students' responses about similarities between volcanoes and geysers in the overlapping part of the circles. Tell students that you are writing down what they say, but they are not expected to be able to read what you write because they are still learning all the rules for decoding. Emphasize that you are writing what they say so that you don't forget. Tell them that you will read the words to them.
- Then, have students record that information on Activity Page 4.1.
- Next, divide students into small groups.

Challenge

Have students who are ready independently complete Activity Page 4.1.

TEKS 1.1.C Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.6.H** Synthesize information to create new understanding with adult assistance.

- Explain that students will work in their small groups to identify how volcanoes and geysers are different. Students should record their answers on Activity Page 4.1 and be prepared to share with the class what they identified.
- When groups finish, have them present the differences they identified. *(Answers may vary but may include: volcanoes—lava erupts from them; they shoot out ash and gas with lava during an eruption; they create mountains; they formed Hawaii; geysers—steam and hot water erupt from them; they may not be as destructive as volcanoes; some like Old Faithful can be reliable; the magma in the hot spot has never erupted out onto the earth's surface)*
- Record students' responses on the Venn diagram on display. Encourage students to add information to their own Venn diagrams as groups present.
- Read the completed Venn diagram to students.

End Lesson

EMERGENT BILINGUAL STUDENTS

Speaking and Listening

Presenting

Beginning
Read the group's information aloud to the class and allow students in the group to elaborate on the information.

Intermediate
Help the group prepare by reading the information aloud to them beforehand.

Advanced/Advanced High
Have the group read their information aloud and add details to the information.

ELPS 1.G; ELPS 3.E; ELPS 3.I

Support

As students share, expand their responses using richer and more complex language, including, if possible, any Read-Aloud vocabulary.

Grade 1 | Unit 5

Pausing Point

NOTE TO TEACHER

You should pause here and spend two days reviewing, reinforcing, or extending the material taught thus far.

You may have students do any combination of the activities listed below, but it is highly recommended you use the Mid-Unit Assessment to assess students' knowledge of the layers of the earth. The other activities may be done in any order. You may also choose to do an activity with the whole class or with a small group of students who would benefit from the particular activity.

CORE CONTENT OBJECTIVES UP TO THIS PAUSING POINT

Students will:

- Explain that different scientists study the different kinds of rocks that make up the earth
- Identify geographical features of the earth's surface: oceans and continents
- Locate the North Pole, the South Pole, and the equator on a globe
- Describe the shape of the earth
- Identify and describe the layers of the earth: crust, mantle, and core (outer and inner)
- Describe how heat, pressure, and time cause many changes inside the earth
- Describe volcanoes
- Describe geysers

MID-UNIT ASSESSMENT

The Layers of the Earth

Directions: Label the layers of the earth. Color the crust brown, the mantle red, the outer core orange, and the inner core yellow.

Activity Page PP.1

ACTIVITIES

The Earth's Surface

Materials: Globe

- Use the globe to review the shape of the earth.
- Have students locate the continents, oceans, North Pole, South Pole, and equator.

Image Review

- Show the Flip Book images from any Read-Aloud again, and have students retell the Read-Aloud using the images.

Image Card Review

Materials: Image Cards 1–6

- In your hand, hold Image Cards 1–6 fanned out like a deck of cards: 1 (heat), 2 (pressure), 3 (time), 4 (Earth's layers), 5 (volcano), 6 (geyser).
- Ask a student to choose a card but not show it to anyone else in the class. The student must then perform an action or give a clue about the picture they are holding. For example, for pressure, a student may use their hand to put pressure on a table. The rest of the class will guess what is being described.
- Proceed to another card when the correct answer has been given.

Image Cards 1–6

Student Choice

- Have a student select a Read-Aloud to be heard again.

Layers of the Earth: Peach

Materials: Peach

Note: Be sure to follow your school's policy regarding food distribution and allergies. Also, be aware that some students may have food insecurities. You may want to substitute the actual object with an image.

- Bring in a fresh peach that has been cut into halves, and use it as a model of the layers of the earth.
- Point to the skin of the peach and ask students what it might represent. *(crust)*
- Point to the fleshy fruit and ask students what it might represent. *(mantle)*
- Point to the pit and ask students what it might represent. *(core)*

Layers of the Earth: Hard-Boiled Egg

Materials: Hard-Boiled egg

Note: Be sure to follow your school's policy regarding food distribution and allergies. Also, be aware that some students may have food insecurities. You may want to substitute the actual object with an image.

- Bring in a Hard-Boiled egg and use it as a model of the layers of the earth.
- Point to the eggshell and ask students what it might represent. *(crust)*
- Point to the white interior and ask students what it might represent. *(mantle)*
- Point to the yellow yolk and ask students what it might represent. *(core)*

Model Earth's Layers

Materials: Yellow, orange, red, and brown modeling dough/clay; paper plates; small pieces of paper; writing tools

- Divide students into groups of five.
- Give one student in each group some yellow dough for the inner core. Ask the student to shape it into a tight ball.
- Provide the next student with a similar-sized amount of orange dough for the outer core and ask them to layer the orange dough around the yellow dough or inner core.
- Provide the third student with a larger amount of red dough and have them layer it over the orange dough to represent the earth's mantle.
- Next, give the fourth student a smaller amount of brown dough to create the earth's thin crust.

- Have each group place their model on a paper plate.
- Ask the fifth student to cut the ball in half with a plastic knife.
- Working as a group, have students label their model by writing *inner core*, *outer core*, *mantle*, and *crust* on small pieces of paper and placing them on top of the corresponding model layers.
- Ask each group to show the class their model, name one layer of the earth, and tell their classmates something they learned about that layer.

You Were There: Volcanoes and Geysers

Materials: Board/chart paper

Note: You may wish to display the question words on the board or chart paper.

- Have students pretend they witnessed the eruption of a volcano or geyser.
- Ask students to describe what they saw and heard. For example, for "volcano," students may talk about seeing the red-hot lava or seeing ash in the air. They may talk about hearing the loud explosion.
- Consider also extending this activity by adding group or independent writing opportunities associated with the "You Were There" concept. For example:
  - Ask students to pretend they are newspaper reporters describing the eruption of a volcano or geyser.
  - As reporters they might use as writing anchors the question words *who*, *what*, *when*, *where*, and *why*.

Key Vocabulary Brainstorming

Materials: Board/chart paper

- Give students a key unit concept or vocabulary word such as *mantle*. Have them brainstorm everything that comes to mind when they hear the word (e.g., beneath the crust, very thick, etc.).
- Record their responses on the board or chart paper.

Class Book: This Planet Rocks

Materials: Paper, drawing tools

- Tell the class or a group of students they are going to make a class book to help them remember what they have learned so far in this unit.
- Have students brainstorm important information about features of the earth's surface, the layers of the earth, volcanoes, and geysers.

- Have each student choose one idea to draw a picture of, and then write a caption for the picture.
- Bind the pages to make a book to put in the class library for students to read again and again.
- You may choose to add more pages upon completion of the entire unit before binding the book.

Heat, Pressure, and Time

- Teach students a "signal" for each of the words *heat*, *pressure*, and *time*.
- For *heat*, have students rub their hands together. Explain that quickly rubbing their hands together produces a little bit of heat.
- For *pressur*e, have students use their hands to press against their thighs. Ask students if they can feel the pressure on their legs.
- For *time*, have students say, "tick-tock, tick-tock" to pretend to be a clock.
- Practice these "signals" until students are comfortable using them.
- Tell students you are going to say a word. Then, they may give any one of the three signals as long as they can explain how the signal and the word are connected. For example:
  - If you say the word *volcano*, one student may give the signal for *heat* and say, "Heat makes the magma very hot."
  - A second student may give the signal for *pressure* and say, "Pressure forces the magma to the surface of the earth."
  - A third student may give the signal for *time* and say, "It takes a long time for the magma to make its way to the surface of the earth."

Letter to a Geologist

Materials: Writing paper, writing tools

- As a class, brainstorm ideas and then write a letter to Gerry or a real geologist. Students may talk about the cool things that geologists do, or they may ask questions that they still have about the earth.
- You may also ask students to write individual letters if they are ready to do this activity on their own.

Create a Geyser

Materials: Small plastic bottle with a narrow neck, warm water, liquid soap, effervescent tablets, large tub or sink

Note: This experiment is messy and may be best completed outside.

- Have student volunteers break the effervescent tablet into small pieces.
- Put the pieces aside for a few minutes and then fill the bottle about ¾ full with warm water.
- Explain to students that the water in a real geyser is extremely hot because it has been heated by the magma underground, but hot water could cause burns, so warm water is being used instead.
- Ask a volunteer to add a few drops of liquid soap to the bottle and to place the bottle in the tub or sink.
- Have a student volunteer drop the pieces of effervescent tablet into the bottle and immediately place their palm firmly over the top of the bottle.
- Explain to students that when a hand is placed over the bottle, the pressure in the bottle increases.
- Have the student release their hand and watch the soap shoot out of the bottle.

LESSON

5

THIS PLANET ROCKS

Minerals

PRIMARY FOCUS OF LESSON

Speaking and Listening

Students will explain the importance of rocks in geology.

TEKS 1.1.A; TEKS 1.6.E

Reading

Students will identify and describe minerals in the earth.

TEKS 1.6.G

Language

Students will demonstrate understanding of the Tier 2 word *characteristics*.

TEKS 1.1.C; TEKS 1.3.B; TEKS 1.6.E

Writing

Students will create a graphic organizer to record information about minerals.

TEKS 1.6.H; TEKS 1.7.B

FORMATIVE ASSESSMENT

Activity Page 5.1

Minerals Web Students will create a web organizer to show their understanding of minerals.

TEKS 1.6.H

TEKS 1.1.A Listen actively, ask relevant questions to clarify information, and answer questions using multi-word responses; **TEKS 1.6.E** Make connections to personal experiences, ideas in other texts, and society with adult assistance; **TEKS 1.6.G** Evaluate details to determine what is most important with adult assistance; **TEKS 1.1.C** Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.6.H** Synthesize information to create new understanding with adult assistance; **TEKS 1.7.B** Write brief comments on literary or informational texts.

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud (10 min.)			
What Have We Already Learned?	Whole Group	10 min.	❑ cookies with at least two visible ingredients
Essential Background Information and Terms			
Read-Aloud (30 min.)			
Purpose for Listening	Whole Group	30 min.	❑ Flip Book: 5A-1–5A-11 ❑ salt
"Minerals"			
Comprehension Questions			
Word Work: *Characteristics*			
This is a good opportunity to take a break.			
Application (20 min.)			
Idea Web	Whole Group/ Partner	20 min.	❑ board/chart paper ❑ Activity Page 5.1
Take-Home Material			
Family Letter			❑ Activity Page 5.2

ADVANCE PREPARATION

Introducing the Read-Aloud

- Bring in cookies that have at least two visible ingredients, such as chocolate chips, nuts, berries, chocolate candies, etc.

Note: Be sure to follow your school's policy regarding food distribution and allergies.

Read-Aloud

- Bring in enough table salt to be able to sprinkle some in each student's hand for them to taste.

Application

- Prepare the beginning of an idea web on the board or chart paper. In the center of the board or chart paper, draw a large hexagon and write *Minerals* inside it. With students, you will draw lines to branch off this center hexagon to smaller circles with information related to minerals.
- You may wish to prepare a few sample idea webs in advance to share with students. You could select familiar topics, such as civilizations or the human body. See the Activity Book Answer Key at the back of this Teacher Guide for an example of a completed idea web for Activity Page 5.1.

Note to Teacher

Students may be confused about the difference between rocks and minerals. Rocks are made up of minerals, often several different ones, but minerals are pure substances that are found in rocks or by themselves in nature. Minerals are the same all the way through, so we call them a sample or a specimen, not a rock.

Universal Access

- You may wish to gather examples or images of minerals, such as gemstones, quartz, and crystals.

CORE VOCABULARY

characteristics, n. ways to describe and group things
Example: Cold and snow are two main characteristics of winter.
Variation(s): characteristic

gemstones, n. stones that are cut and polished to be used in jewelry
Example: We were amazed at the sizes and brilliant colors of the gemstones on display in the museum.
Variation(s): gemstone

minerals, n. natural substances found in the earth; the building blocks of rocks
Example: Minerals such as diamonds and salt come in many shapes and sizes.
Variation(s): mineral

traces, n. very small amounts
Example: Even after cleaning, there were still traces of dust on his glasses.
Variation(s): trace

Vocabulary Chart for "Minerals"

Type	**Tier 3 Unit-Specific Words**	**Tier 2 General Academic Words**	**Tier 1 Everyday Speech Words**
Vocabulary	gemstones (*gemas*) minerals (*minerales*)	characteristics (*características*)	
Multiple-Meaning		traces	
Sayings and Phrases			

Lesson 5: Minerals

Introducing the Read-Aloud

10M

Speaking and Listening: Students will explain the importance of rocks in geology.

TEKS 1.1.A; TEKS 1.6.E

WHAT HAVE WE ALREADY LEARNED? (5 MIN.)

- Ask students what most of the earth is made of. *(rock)* Note that there are many different types of rocks on the earth.

Check for Understanding

Recall: What do geologists spend most of their time studying? *(rocks)*

- Ask students why the Grand Canyon in Arizona provides a lot of clues about how parts of the earth formed. *(Scientists can see and study many different layers of rock at the same time.)*
- Have students describe rocks they have seen and/or used for something. Encourage them to explain where they saw the rocks and/or how they used them for something. *(Answers may vary.)*

EMERGENT BILINGUAL STUDENTS

Language

Selecting Language Resources

Beginning
Have students verbally share key words and phrases related to their experiences with rocks.

Intermediate
Have students verbally craft a complete sentence based on their experiences with rocks.

Advanced/Advanced High
Have students verbally craft a detailed sentence based on their experiences with rocks.

ELPS 1.A

TEKS 1.1.A Listen actively, ask relevant questions to clarify information, and answer questions using multi-word responses; **TEKS 1.6.E** Make connections to personal experiences, ideas in other texts, and society with adult assistance.

ESSENTIAL BACKGROUND INFORMATION AND TERMS (5 MIN.)

Note: Be sure to follow your school's policy regarding food distribution and allergies.

- Tell students that rocks are made of minerals.
- Show students a cookie with at least two visible ingredients (e.g., chocolate chips, nuts, berries, etc.).
- Ask students to describe the cookie. *(Answers may vary but should include the awareness of different ingredients that are visible.)*
- Tell them to pretend the cookie is a rock. Explain that if the cookie is a rock, the chocolate chips, nuts, berries, raisins, etc., are the minerals that make up the rock.
- Explain that sometimes minerals are found by themselves in nature, just like chocolate chips in the cookie can be eaten by themselves.
- Explain that mostly, minerals are found in rocks and most rocks contain several different minerals.
- You may wish to pass out cookies to students and have them describe the size, shape, color, and texture of the cookies to their partners.
- Remind students that the cookies are similar to rocks and the chocolate chips, etc., are similar to minerals found in rocks or by themselves in nature.

Lesson 5: Minerals

Read-Aloud

30M

Reading: Students will identify and describe minerals in the earth.

TEKS 1.6.G

Language: Students will demonstrate understanding of the Tier 2 word *characteristics*.

TEKS 1.1.C; TEKS 1.3.B; TEKS 1.6.E

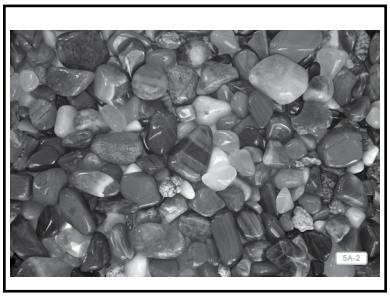
PURPOSE FOR LISTENING

- Tell students to listen carefully to hear all of the different ways minerals can be described.

"MINERALS" (15 MIN.)

Show Image 5A-1: Gerry with his rock collection

As a geologist, it is my job to study rocks. There are many, many different kinds of rocks out there in the world. And I have collected quite a few rocks during my time as a geologist!

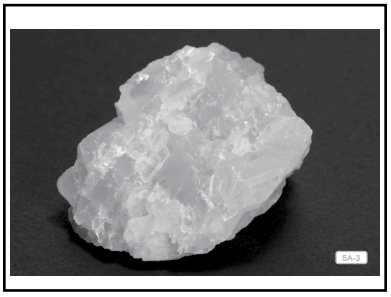


Show Image 5A-2: Polished gemstones

What colors do you see?

Here are some of the rocks and **minerals** from my collection. I have polished these in a special machine called a rock tumbler, which makes them shiny and really brings out the color. In this pile alone, I can see amethyst, tiger's eye, rose quartz, turquoise, red jasper, agate, unakite, onyx . . . whoa! Sorry, I get carried away sometimes.

TEKS 1.6.G Evaluate details to determine what is most important with adult assistance; **TEKS 1.1.C** Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.6.E** Make connections to personal experiences, ideas in other texts, and society with adult assistance.



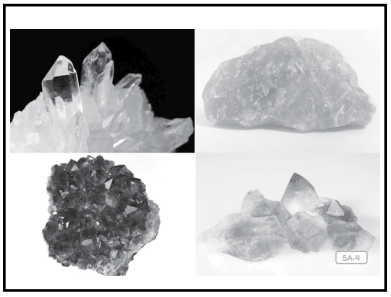
Show Image 5A-3: Milky quartz
Minerals are the building blocks of rocks. All rocks contain minerals. Sometimes you can find pure minerals unmixed with other minerals, but most rocks contain several different minerals. There are over three thousand different types of minerals, and scientists still discover new ones from time to time.

Minerals come in all different shapes, sizes, colors, and textures. We use these different **characteristics** to divide minerals into groups. *Characteristics are ways to describe and group things.* Some of these mineral groups are quite common, whereas others are very unusual and even difficult to describe. I will tell you about a few of the best-known minerals.

For instance, this is a picture of the mineral quartz. Quartz is the most common mineral in the earth's crust—not the most common in the whole earth, just the most common mineral in the crust. This picture shows a type of quartz called milky quartz.

Check for Understanding

Vocabulary: What is the crust of the earth? *(the outermost layer of the earth)*



Show Image 5A-4: Varieties of quartz
Quartz comes in many varieties. Those are clear quartz crystals on the top left. *Crystals are small pieces of minerals that have many sides and distinct shapes.* Some minerals form into perfect crystals like these, and some don't. It all depends on where and how they are formed within the earth.

Crystals can come in all different sizes. Some are as small as a pea; some are the size of your arm or longer.

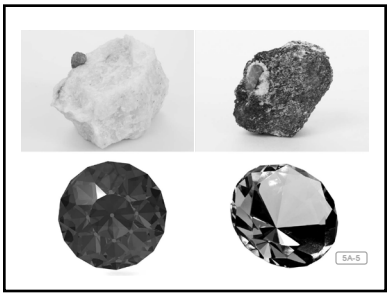
Support

Variations is related to the word *vary*, just like *varies* is. Students learned about the word *varies* in a previous lesson.

Challenge

Ask students to name other gemstones they have heard of.

As for the color variations in different types of quartz, these are largely caused by the addition of very small amounts of various types of metals into the mineral. *Color variations are color differences.* For instance, the beautiful purple color of amethyst is caused by **traces** of iron and aluminum metal. *Traces are very small amounts.*



Show Image 5A-5: Ruby and sapphire

Examples of rare **gemstones** are some varieties of corundum—a mineral composed mostly of aluminum and oxygen. *A gemstone is a stone that is cut and polished to be used in jewelry. Can you find the gemstones in the image?* Red corundum is known as ruby, and blue corundum is known as sapphire. Rubies and sapphires are among the most beautiful mineral crystals on earth.

Show Image 5A-6: Emerald

Here is another beauty. This is called emerald. Emerald is a variety of the mineral beryl, which also comes in many different colors, including green, blue, yellow, and red. Deep-green emerald is my favorite. *[Have a student point to the gemstone.]*

Show Image 5A-7: Diamonds

And here is one of the most famous minerals. Do you know what these beauties are called? *[Pause for students to answer.]* These are diamonds. A diamond is the hardest mineral in the whole world. A diamond is hard enough to cut through glass or scratch other minerals. The diamond on the left is a raw diamond, fresh from the earth. The diamond on the right has been cut and polished. The sides of a cut diamond are called facets.

Show Image 5A-8: Jeweler looking at diamond

You need special equipment and skills to cut and polish diamonds or other gemstones such as rubies and emeralds. People who cut diamonds look through powerful magnifying glasses as they do their work. This is so they can see all the tiny little facets, or sides. *[Explain that the inset shows what the jeweler sees through the magnifying glass.]*

Show Image 5A-9: Salt

Here is one mineral that we use every day! Have you ever heard of salt? *[Pause for students to answer. Sprinkle some table salt in each student's hand so that each student can taste salt.]* Salt, or sodium chloride, is a common mineral that is found in the oceans and on Earth. Sodium chloride is called table salt when we use it in food, and rock salt when we use it to make roads safer during winter storms.

Some people put table salt on food to make it taste better. In fact, salt is an extremely important nutrient for people as well as animals. Your body needs salt—not too much, but just enough. Too much salt is bad for you. If you eat too much salt, your body will tell you so because you will feel thirsty.

Salt appears in many forms in nature. Rock salt can be found in the form of halite crystals, like the rectangular-shaped crystal pictured on the left in the image. You can't see salt in water because it dissolves, but you'll know it's there if you ever taste ocean water. *When salt mixes with water, the salt dissolves in the water, or mixes with the water so that no more solid pieces are visible, to form salt water.*

Show Image 5A-10: Gerry pointing to a blackboard

Why do all these different minerals look the way they do? Each has its own story—and it gets pretty complicated—but you can bet that there were three basic things in common: *Do you know what three things Gerry is thinking of?* heat, pressure, and time. These three factors play a role in the formation of every mineral.

Show Image 5A-11: Gerry with his rock collection

An important thing to remember about the rocks you find in nature is that you should leave them there so that other people can also enjoy them. Without rocks, environments, *or natural surroundings*, change dramatically. If the environment changes, the plants and animals that live there might have a hard time finding food and shelter.

Now I've told you a bit about some of my favorite minerals. Take a look at the ground the next time you go outside, and you might actually see something interesting!

COMPREHENSION QUESTIONS (10 MIN.)

1. **Inferential.** Why does Gerry the Geologist have so many rocks? *(Gerry the Geologist studies rocks.)*
2. **Literal.** What are minerals? *(Minerals are natural substances found in the earth; they are the building blocks of rocks, or what rocks are made of.)* Name some of the minerals that you heard about. [You may want to show images 5A-3–5A-7 and 5A-9 as clues.] *(Some of the minerals were quartz, ruby, sapphire, emerald, diamond, and salt.)*
3. **Literal.** What is a gemstone? *(A gemstone is a stone that is cut and polished to be used in jewelry.)*
4. **Literal.** Where might you find the mineral salt? *(Salt is found in the oceans and in the earth.)* How is salt used by people? *(Table salt is used to flavor food, and rock salt is used to make roads safer during winter storms.)*

Check for Understanding

Think-Pair-Share: How are the minerals you heard about similar? *(Answers may vary but may include that they are found in the earth, they can be useful, etc.)* How are they different? *(Answers may vary but may include that they are used for different things, they have different appearances, etc.)*

WORD WORK: CHARACTERISTICS (5 MIN.)

1. In the Read-Aloud you heard Gerry say, "Minerals come in all different shapes, sizes, colors, and textures. We use these different characteristics to divide minerals into groups."
2. Say the word *characteristics* with me.
3. *Characteristics* are ways to describe and group things.
4. Some characteristics of diamonds are that they are colorless and that they can scratch other minerals. Some characteristics of Gerry the Geologist are that he has black hair and a mustache, and loves to study rocks.
5. Choose an object in the the room. What are some characteristics that describe the object you chose? Try to use the word *characteristics* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "Characteristics of me are . . ."]
6. What's the word we've been talking about?

Use a Discussion activity for follow-up. Discuss some characteristics of our school. How could you describe and group people or things in our school? Be sure to use the word *characteristic(s)* and answer in complete sentences.

EMERGENT BILINGUAL STUDENTS

Reading

Reading/Viewing Closely

Beginning
Prompt students to recall words and phrases related to how minerals are similar and different.

Intermediate
Provide moderate support in eliciting phrases and ideas related to how minerals are similar and different.

Advanced/Advanced High
Provide minimal support in eliciting key details related to how minerals are similar and different.

ELPS 4.G; ELPS 4.I

Lesson 5: Minerals

Application

20M

Writing: Students will create a graphic organizer to record information about minerals.

TEKS 1.6.H; TEKS 1.7.B

IDEA WEB (20 MIN.)

- Direct students' attention to the idea web you started in advance. Explain that together you will begin an idea web about minerals.
- Explain that an idea web is a way to organize information about a certain topic. The topic of the web is listed in the middle circle. Then, you create new branches of information using smaller circles connected to the main circle. These smaller circles include topics that relate to the main topic.
- Briefly share sample idea webs you created in advance.
- Have students turn to Activity Page 5.1. Explain that the middle of this idea web says "Minerals." Students will branch off from this middle circle with information related to minerals.

Activity Page 5.1

Check for Understanding

Use Evidence: What did you learn about minerals? *(Answers may vary but may include: they are the building blocks of rocks, or what rocks are made of; they often form crystals; certain kinds can be used for making jewelry; other kinds can be eaten; etc.)*

- You may wish to record ideas on the board or chart paper as students describe what they learned about minerals.
- Model for students how to add an idea to the idea web by taking one of the things they shared about minerals and adding it to the web. Draw a line from the middle circle to a blank space. Then add a new circle at the end of the line you drew and write the new idea in that circle.

TEKS 1.6.H Synthesize information to create new understanding with adult assistance; **TEKS 1.7.B** Write brief comments on literary or informational texts.

- Have students add the new idea to Activity Page 5.1 as well.
- Then, have students work in pairs to add more information to their idea webs.
- When student pairs have completed their webs, have them write two or three sentences on the back about the information in the web.
- Allow pairs to share their idea webs. Have students discuss similarities and differences between webs, both in terms of information and what the webs look like.

End Lesson

Lesson 5: Minerals

Take-Home Material

FAMILY LETTER

- Send home Activity Page 5.2.

EMERGENT BILINGUAL STUDENTS

Writing

Writing

Beginning
Have students identify facts and ideas about minerals using familiar vocabulary and dictate them to a teacher to be recorded on the idea web.

Intermediate
Have students identify facts and ideas about minerals using familiar vocabulary and dictate them to a peer to be recorded on the idea web

Advanced/Advanced High
Have students write facts and ideas on the idea web using familiar vocabulary.

ELPS 3.E

Activity Page 5.2

LESSON

6

THIS PLANET ROCKS

The Three Types of Rocks

PRIMARY FOCUS OF LESSON

Speaking and Listening

Students will review how heat, pressure, and time affect the earth.

TEKS 1.1.A; TEKS 1.1.C

Reading

Students will identify the three types of rocks.

TEKS 1.6.D; TEKS 1.6.G

Language

Students will demonstrate understanding of the Tier 3 word *sediments*.

TEKS 1.3.B

Reading

With assistance, students will use a graphic organizer to identify and describe the three types of rocks.

TEKS 1.3.B; TEKS 1.7.B

FORMATIVE ASSESSMENT

Activity Page 6.1

Types of Rocks Students will identify and describe the three types of rocks.

TEKS 1.7.B

TEKS 1.1.A Listen actively, ask relevant questions to clarify information, and answer questions using multi-word responses; **TEKS 1.1.C** Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.6.D** Create mental images to deepen understanding with adult assistance; **TEKS 1.6.G** Evaluate details to determine what is most important with adult assistance; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.7.B** Write brief comments on literary or informational texts.

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud (10 min.)			
What Have We Already Learned?	Whole Group	10 min.	❑ Image Cards 1–3
Essential Background Information and Terms			
Read-Aloud (30 min.)			
Purpose for Listening	Whole Group	30 min.	❑ Flip Book: 6A-1–6A-16 ❑ dirt ❑ small rocks ❑ glass of water ❑ U.S. map
"The Three Types of Rocks"			
Comprehension Questions			
Word Work: *Sediments*			
This is a good opportunity to take a break.			
Application (20 min.)			
Types of Rocks	Whole Group	20 min.	❑ Types of Rocks Chart (Digital Components) ❑ Activity Page 6.1

ADVANCE PREPARATION

Read-Aloud

- You will demonstrate how sediments sink to the bottom of water. Be sure to use a clear glass so students can see the dirt and rocks settle on the bottom.

Application

- Prepare a three-column chart on the board or chart paper and label each column with one of the three types of rocks. Add Image Card 7 (igneous rock), Image Card 8 (sedimentary rock), and Image Card 9 (metamorphic rock) to the appropriate columns.

Universal Access

- You may wish to gather images of the three types of rocks to share with students.

CORE VOCABULARY

igneous rock, n. a type of rock that forms when magma cools, hardens, and turns solid
Example: Obsidian and granite are two types of igneous rocks.
Variation(s): igneous rocks

metamorphic rock, n. a type of rock that forms when intense heat and pressure change igneous and sedimentary rocks into new rocks
Example: Marble is a metamorphic rock formed from limestone, a sedimentary rock.
Variation(s): metamorphic rocks

ore, n. a rock that contains valuable minerals or metals
Example: Iron ore is one of the most important types of ore in the world.
Variation(s): ores

sedimentary rock, n. a type of rock that forms from layers of sediments pressed together
Example: Coal is a type of sedimentary rock used as an energy source.
Variation(s): sedimentary rocks

sediments, n. little tiny pieces of dirt and rock that are moved by wind, ice, water, or landslides
Example: Sediments settled at the bottom of the swimming pool.
Variation(s): sediment

Vocabulary Chart for "The Three Types of Rocks"

Type	Tier 3 Unit-Specific Words	Tier 2 General Academic Words	Tier 1 Everyday Speech Words
Vocabulary	igneous rock (*roca ígnea*) metamorphic rock (*roca metamórfica*) ore sedimentary rock (*roca sedimentaria*) sediments (*sedimentos*)		
Multiple-Meaning			
Sayings and Phrases			

Start Lesson

Lesson 6: The Three Types of Rocks

Introducing the Read-Aloud

10M

Speaking and Listening: Students will review how heat, pressure, and time affect the earth.

TEKS 1.1.A; TEKS 1.1.C

WHAT HAVE WE ALREADY LEARNED? (5 MIN.)

Check for Understanding

Recall: What three words did Gerry the Geologist say to keep in mind when thinking about rocks? [Use Image Cards 1–3 as clues.] *(heat, pressure, and time)*

- Ask students to share how heat, pressure, and time affect the following things on the earth:
  - volcanoes *(Answers may vary but may include: heat makes magma very hot; pressure forces the magma to move and causes volcanoes to erupt; it takes a long time for magma to reach the surface of the earth; etc.)*
  - geysers *(Answers may vary but may include: heat makes magma very hot; pressure builds when water seeps in and touches the hot rocks; it takes time for pressure to cause a geyser to release steam and water; etc.)*
  - the layers of the earth *(Answers may vary but may include: as you go deeper in the earth, closer to the core, the mantle gets hotter and the heat causes the rock inside the mantle to move; scientists estimate the inner core is hotter than the sun; pressure makes it harder to dig deeper in the earth with a shovel; the inner core is solid because of the incredible pressure of the earth's weight pressing inward; over time rocks on the earth's surface have changed, allowing geologists to better study the earth; etc.)*

TEKS 1.1.A Listen actively, ask relevant questions to clarify information, and answer questions using multi-word responses; **TEKS 1.1.C** Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language.

Image Cards 1–3

Support

Remember to repeat and expand upon each response using richer and more complex language, including, if possible, any Read-Aloud vocabulary.

EMERGENT BILINGUAL STUDENTS

Reading

Reading/Viewing Closely

Beginning
Prompt students to recall words and phrases related to how heat, pressure, and time affect various things on the earth.

Intermediate
Provide moderate support in eliciting phrases and ideas related to how heat, pressure, and time affect various things on the earth.

Advanced/Advanced High
Provide minimal support in eliciting key details related to how heat, pressure, and time affect various things on the earth.

ELPS 4.G; ELPS 4.I

ESSENTIAL BACKGROUND INFORMATION AND TERMS (5 MIN.)

- Tell students that all rocks can be sorted into three categories because of how they were formed by heat, pressure, and time.
- Explain that you will need students' help during the Read-Aloud. Explain that you want them to do certain actions when they hear certain words in the Read-Aloud.
- Preview actions that you would like students to do whenever you say the following:
  - *igneous rock(s):* Whenever students hear *igneous rock(s)*, they should hold up their index finger like it is a candle and pretend to blow out the flame to demonstrate the heat of fire.
  - *sedimentary rock(s):* Whenever students hear *sedimentary rock(s)*, they should repeatedly place one flattened hand on top of the other to demonstrate the formation of layers over time.
  - *metamorphic rock(s):* Whenever students hear *metamorphic rock(s)*, they should hold out both hands and then clasp them tightly together to demonstrate pressure.
- Have students briefly practice the motions as you say the different terms aloud.

Lesson 6: The Three Types of Rocks

Read-Aloud

30M

Reading: Students will identify the three types of rocks.

TEKS 1.6.D; TEKS 1.6.G

Language: Students will demonstrate understanding of the Tier 3 word *sediments*.

TEKS 1.3.B

PURPOSE FOR LISTENING

- Tell students to listen carefully to learn about the three types of rocks and how they are formed.

"THE THREE TYPES OF ROCKS" (15 MIN.)

Show Image 6A-1: Gerry pointing to a blackboard

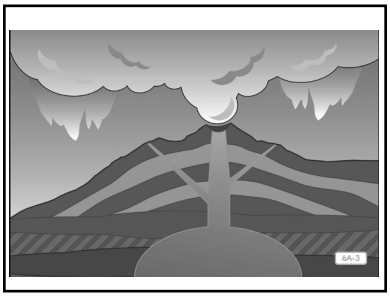
The right amount of heat can turn a solid rock or metal into a liquid. *What is the difference between solid rock and liquid rock? (Solid rock does not change shape; liquid rock takes on the shape of its surroundings.)* Pressure from the weight of the earth and movement of materials inside the earth can crush rocks. Over time, the effects of heat and pressure create the rock formations and other geologic phenomena that we find in the world.

Working together, heat, pressure, and time create the three types of rocks that exist in the world. Every rock in the world can be placed into one of three categories. The three types of **rocks** are **igneous**, **sedimentary**, and **metamorphic**. Try saying each of these rock types out loud: igneous . . . sedimentary . . . metamorphic. *[Say each word and have students repeat it.] What are the three types of rocks?*

TEKS 1.6.D Create mental images to deepen understanding with adult assistance; **TEKS 1.6.G** Evaluate details to determine what is most important with adult assistance; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings.

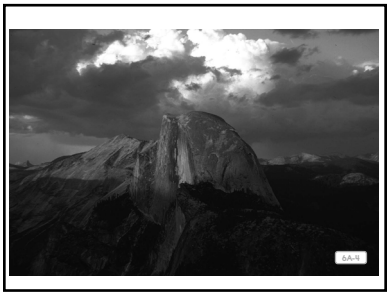
Show Image 6A-2: Granite surface

The first rock type, igneous, is the most common. *Remember, whenever you hear* igneous rock(s)*, hold up your finger like it is a candle and pretend to blow out the flame.* Igneous rocks come in many forms. Some form entire mountains, and some appear as boulders jutting from the earth. This picture shows a close-up of one type of igneous rock. This plain, old, gray rock contains different types of minerals, and it hasn't always been a plain, old, gray rock.



Show Image 6A-3: Diagram of magma movement

The word *igneous* comes from the Latin word for fire, because igneous rocks begin deep down in the heat of the earth's mantle. *The word* igneous *sounds similar to the word* ignite*, which means to light something on fire. Both come from* ignis*, the Latin word for fire. Making connections between words and roots will help you to learn more words!* As you have heard, the earth's mantle is full of a hot, gooey, oozing substance known as magma, or melted rock. The magma is constantly being forced toward the surface by pressure from within the earth. As it travels upward from the mantle through the crust, the magma begins to cool and harden. Sometimes, the magma will erupt from a volcano, but sometimes, the conditions aren't quite right for an eruption. *Over time, heat forms magma, and pressure moves the magma. When the magma cools, it forms igneous rock.*



Show Image 6A-4: Half Dome, Yosemite National Park

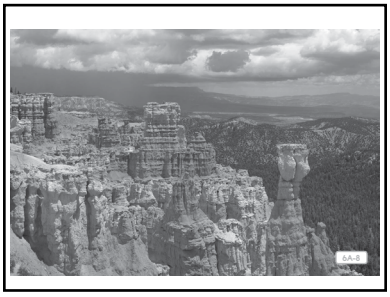
This formation is called Half Dome, and it is located in Yosemite National Park in California. When you look at Half Dome, you are looking at an old magma chamber. A magma chamber is a pocket, or place, in the earth's crust where magma collects. As more magma enters the chamber, it gets hotter and pressure builds, and the magma can force its way up to the surface in the form of a volcano.

Or, sometimes, as in the case of Half Dome, the magma just gathers in the chamber and stays there without erupting. For whatever geologic reason, the heat and pressure did not get great enough, *or strong enough*, to force the magma through the crust and onto the surface in the form of lava. Instead, the magma cooled and hardened within the chamber. Over time, the rocks and soil around the chamber eroded away, leaving beautiful Half Dome alone, sticking high up above the earth. Half Dome is certainly a big igneous rock! *Did you hear* igneous rock*? Blow out the fire!*

Show Image 6A-5: Sill
Another type of igneous formation occurs when magma intrudes, or pushes itself, between two existing layers of rock. This means that not all the layers in this mountain were formed one on top of the other. Rather, some of the layers forced their way in between other rocks.

Show Image 6A-6: Obsidian
This is my favorite type of igneous rock: obsidian, better known as volcanic glass. Volcanic glass forms when certain types of lava cool and harden quickly, becoming smooth, shiny, and glass-like. Only certain types of lava under certain conditions become volcanic glass. *Characteristics of volcanic glass are smooth, shiny, and glass-like.*

Show Image 6A-7: Obsidian spearhead
Some Native Americans used volcanic glass to make arrowheads and spearheads. If you break a piece of volcanic glass, you will find that it is incredibly sharp and strong. Every now and then I find ancient artifacts, *or objects made by people long ago*, like this when I'm out rock hunting. *Which type of rock have you heard about so far: igneous rock, sedimentary rock, or metamorphic rock? [Prompt students to repeat* igneous rock *in unison and pretend to blow out the flame.]*



Show Image 6A-8: Bryce Canyon

After igneous, the second major rock type is sedimentary. *Remember, whenever you hear* sedimentary rock(s)*, repeatedly place one flattened hand over the other.* Sedimentary rocks are not formed like igneous rocks, which form from cooled magma. In fact, heat does not play much of a role at all in the formation of sedimentary rocks. Instead, pressure and time are the most important factors in the formation of sedimentary rocks.

Check for Understanding

Recall: Of heat, pressure, and time, which two are the most important in forming sedimentary rocks? *(pressure and time)*

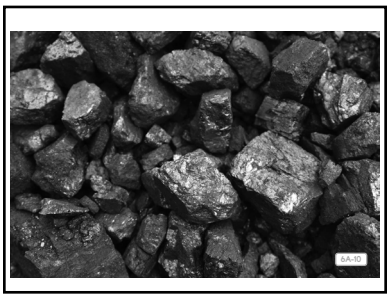
Show Image 6A-9: Sediments

The word ***sediments*** refers to tiny little particles, such as dirt or rock, which are carried along in water, ice, wind, or landslides. *Do you hear the word* sediment *in* sedimentary*?* If you dump a spoonful of sand into a glass of water, for instance, you will see the sand gradually sink down and settle on the bottom of the glass, much in the same way that sediments settle on the bottoms of lakes and oceans. *Here,* sink *means to drop below the surface of water. [Demonstrate for students how sediments sink to the bottom by dropping bits of dirt and rock into a glass of water. Have students watch how the dirt slowly sinks to the bottom of the glass.]* Sediments are always floating around in lakes, oceans, and rivers. Over time, sediments in lake water settle and form a thick sludge on the bottom of a lake. As more and more sediments settle on the bottom, more and more weight presses down on the sludge. Over time, the pressure from the weight of the upper sediments can cause the sludge to harden into rock. Through time and pressure, layers of sediments are turned into sedimentary rock. *How are sedimentary rocks formed? (Time and pressure turn layers of sediment into sedimentary rock.) [Prompt students to repeat* sedimentary rock *in unison*

Support

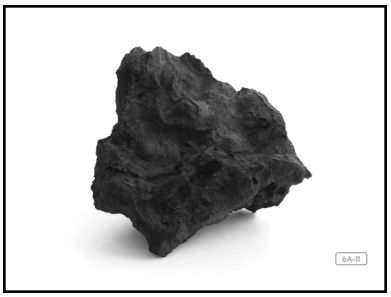
The word *sink* also means a bowl for washing that has a faucet for water and a drain at the bottom, usually found in kitchens and bathrooms. For additional support, refer to Poster 3M in the Flip Book for multiple meanings of *sink*.

and repeatedly place their hands one over the other.]



Show Image 6A-10: Coal

Coal is a type of sedimentary rock that comes from decayed plants that have been under pressure for many years. *Decayed plants are plants that have died and their remains have naturally broken down over time and gone back into the soil.* Coal is an important energy source. People burn coal in order to create electricity for homes and to make energy to power machines in factories. People get coal and other important rocks, minerals, and metals by mining them from the earth. One way to mine coal is by digging a mineshaft, or tunnel, deep down into the earth.



Show Image 6A-11: Iron ore

Another sedimentary rock is called iron **ore**. Ore is a rock that contains valuable minerals or metals. There are many different types of ore in the world, but iron ore is one of the most important. Iron ore is the source of iron, a strong metal which is used to make steel. Steel, in turn, is used to build bridges, cars, buildings, tools, and other things you see and use every day.

Show Image 6A-12: Bryce Canyon

Sandstone is one common type of sedimentary rock. *Did you hear* sedimentary rock*? Make layers of sediments with your hands!* Wherever you find sandstone, there is a good chance that you are walking in a place that used to be completely underwater. At one time or another, every place on earth has been completely submerged, in *or covered with*, water. Thus, sandstone is quite common throughout the world. This photo was taken in Bryce Canyon, in the state of Utah, which is known for its unique sandstone formations. *[Locate Utah on a map for students.]*

Challenge

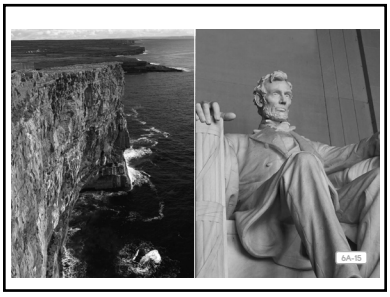
Ask students to explain what it means when something erodes.

Show Image 6A-13: Antelope Canyon

Here is another sandstone canyon I thought you would like to see. Antelope Canyon, in Arizona, is a very special place. *[Locate Arizona on a map for students.]* It is known as a slot canyon, which is formed over time as water from rain and floods rushes through the sandstone, causing it to erode.

Show Image 6A-14: Limestone cliffs

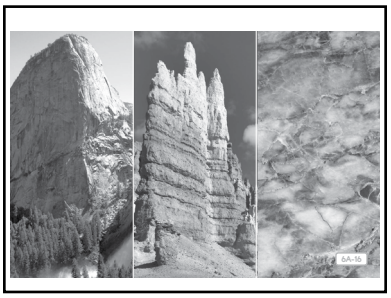
These cliffs are made of limestone, another type of sedimentary rock. Limestone is interesting because it is composed mainly of minerals left over from ancient sea creatures like clams, oysters, and other shellfish. When these creatures died, their shells sank down to the ocean floor and settled with the other sediments. Over time, the churning oceans ground the shells into a fine white powder. The powder settled and more shells and sediments put pressure on it. It took many years, but eventually all the powdery shell leftovers were compressed into limestone. *Did you hear the words* pressure *and* time*? With pressure and a long period of time, the shells of sea creatures turned into sedimentary rock. Which two types of rocks have you learned about so far? Hint: One is formed by cooled magma and the other is made of sediments.*



Show Image 6A-15: Limestone to marble

If limestone is subjected to intense pressure and heat for an even longer period of time, it can turn into another kind of rock called marble. Marble is very hard, and it often has a beautiful, pure white color. People have used marble for thousands of years to make fine buildings and sculptures.

Marble is known as a metamorphic rock, which is the third and least common type of rock. *Remember, whenever you hear* metamorphic rock*, hold out both hands and then clasp them tightly together. Metamorphic* comes from the Greek word for *transformation*, or change. Metamorphic rocks are formed when other types of rocks undergo intense heat and pressure and change, or metamorphose, into new kinds of rocks. *What's the third type of rock, formed when heat and pressure change igneous and sedimentary rocks into new kinds of rocks?*



Show Image 6A-16: Three types of rock
Congratulations! You are becoming a geologist! Now you know about the three rock types: igneous, sedimentary, and metamorphic. Won't everyone be impressed when you tell them about the new words you learned?

Check for Understanding

Evaluate an Idea: Are heat, pressure, and time important in the formation of all three types of rocks? *(No. Heat, pressure, and time are important in the formation of igneous rock and metamorphic rock, but only pressure and time are important in the formation of sedimentary rock.)*

EMERGENT BILINGUAL STUDENTS

Reading

Reading/Viewing Closely

Beginning
Prompt students to recall words and phrases related to how the three types of rocks are similar and different.

Intermediate
Provide moderate support in eliciting phrases and ideas related to how the three types of rocks are similar and different.

Advanced/Advanced High
Provide minimal support in eliciting key details related to how the three types of rocks are similar and different.

ELPS 4.G; ELPS 4.I

COMPREHENSION QUESTIONS (10 MIN.)

1. **Literal.** What are the three types of rocks? *(The three types of rocks are igneous rock, sedimentary rock, and metamorphic rock.)*
2. **Literal.** How are igneous rocks formed? Remember: igneous means "fire." *(Igneous rocks are formed when magma or lava cools and hardens.)*
3. **Literal.** How are sedimentary rocks formed? *(Sediments settle and form a thick sludge on the bottom of a lake that thickens over time. The pressure from the weight of the sediments makes it harden into sedimentary rock.)*
4. **Literal.** How are metamorphic rocks formed? *(Metamorphic rocks are formed when heat and pressure change igneous and sedimentary rocks into new rocks.)*
5. **Evaluative.** How are the three types of rocks similar? *(The three types of rocks are similar because they are all found in the earth, they are all formed over time, and they all help scientists study how Earth's surface changes.)* How are they different? *(The three types of rocks are formed differently. Igneous rocks are formed when magma or lava cools and hardens. Sedimentary rocks are formed when layers of sediments are pressed together over time. Metamorphic rocks are formed when other types of rocks undergo intense heat and pressure.)*

WORD WORK: SEDIMENTS (5 MIN.)

1. The Read-Aloud said, "Sediments are always floating around in lakes, oceans, and rivers."
2. Say the word *sediments* with me.
3. *Sediments* are little tiny pieces of dirt or rock that are moved by wind, ice, water, or landslides. [You may want to remind students of the quick experiment you did when you put dirt and rocks in the glass of water.]
4. When you go swimming in a lake, your feet kick up sediments that are on the bottom of the lake.
5. What are some other places that you might see sediments? Try to use the word *sediments* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "I saw sediments in . . . "]
6. What's the word we've been talking about?

Use a Making Choices activity for follow-up. I will describe some objects. If I describe sediments, say, "Those are sediments." If I do not describe sediments, say, "Those are not sediments."

- I noticed tiny specks of dirt in my glass of water. *(Those are sediments.)*
- The ants crawled through the blades of grass. *(Those are not sediments.)*
- The wind blew small bits of dust all over the car. *(Those are sediments.)*
- Dad cleaned the small grains of sand out of the bathtub. *(Those are sediments.)*
- The museum has many large gemstones. *(Those are not sediments.)*

Lesson 6: The Three Types of Rocks

Application

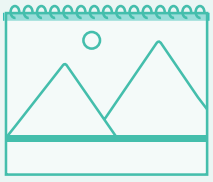
20M

Reading: With assistance, students will use a graphic organizer to identify and describe the three types of rocks.

TEKS 1.3.B; TEKS 1.7.B

Activity Page 6.1

Flip Book 6A-1–6A-16



TYPES OF ROCKS (20 MIN.)

- Direct students' attention to the Types of Rocks chart you prepared in advance and have them turn to Activity Page 6.1. Describe the column headers and the Image Cards you added to the chart in advance.
- Tell students together you will use the chart, along with the text and images from the Read-Aloud, to describe the three different types of rocks.
- Briefly review Images 6A-1–6A-7 with students.
- Then, ask students to share what they learned about igneous rocks. *(Answers may vary but may include that they are the most common type of rock; they are formed when magma or lava cools and hardens; and mountains, boulders, Half Dome and volcanic glass are examples of igneous rock.)*
- Record students' responses on the Types of Rocks chart in the "Igneous Rock" column. Explain that you are going to write down what they say, but they are not expected to be able to read what you write because they are still learning all the rules for decoding. Emphasize that you are writing what they say so you don't forget. Tell them that you will read the words to them.
- Have students write or draw at least two of the facts discussed about igneous rock on Activity Page 6.1 in the appropriate column.
- Briefly review Images 6A-8–6A-14 with students.
- Ask students to share what they learned about sedimentary rocks. (*Answers may vary but may include that they form when pressure over time hardens layers of sediments; heat doesn't play a role in forming them; coal is a type of sedimentary rock; ore is another kind and contains valuable minerals or metals; and Bryce Canyon and Antelope Canyon are examples of a type of sedimentary rock called sandstone.)*

Challenge

Have students write as many facts as possible in each column of the chart on Activity Page 6.1 and then write a sentence for each type of rock on the back of the activity page.

Support

Have students work in pairs or small groups to complete Activity Page 6.1 and write at least one sentence about rocks, or a type or rock, on the back of the activity page.

TEKS 1.3.B Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.7.B** Write brief comments on literary or informational texts.

- Record students' responses on the Types of Rocks chart in the "Sedimentary Rock" column. Read the words to students.
- Have students write at least two of the facts discussed about sedimentary rock on Activity Page 6.1 in the appropriate column.
- Briefly review Images 6A-15 and 6A-16 with students.
- Ask students to share what they learned about metamorphic rocks. (*Answers may vary but may include that they are the least common type of rock; they form when other types of rocks undergo intense heat and pressure over time and thus change into new rocks; and marble is a type of metamorphic rock.)*
- Record students' responses on the Types of Rocks chart in the "Metamorphic Rock" column. Read the words to students.
- Have students write at least two of the facts discussed about metamorphic rock on Activity Page 6.1 in the appropriate column.
- Once the chart has been completed, read it to the class.
- Have students turn to the back of the activity page and write at least one sentence about rocks, whether it is about one type of rock or more than one type of rock.

End Lesson

EMERGENT BILINGUAL STUDENTS

Writing

Writing

Provide a specific sentence frame (e.g., "The three types of rocks . . ." or "One type of rock . . .").

Beginning
Allow students to dictate the sentence to an adult.

Intermediate
Allow students to dictate the sentence when necessary.

Advanced/Advanced High
Have students write the sentence independently.

ELPS 5.B

LESSON

7

THIS PLANET ROCKS

Fossils

PRIMARY FOCUS OF LESSON

Speaking and Listening

Students will review characteristics of some of the earth's features.

TEKS 1.1.C; TEKS 1.1.D

Reading

Students will explain how fossils provide information about animals and plants that lived long ago.

TEKS 1.7.C

Language

Students will demonstrate understanding of the Tier 2 word *preserved*.

TEKS 1.3.B

Writing

With assistance, students will dictate or write a letter about fossils.

TEKS 1.11.E; TEKS 1.12.C

FORMATIVE ASSESSMENT

Friendly Letter

Students will dictate or write a letter using information they learned about fossils.

TEKS 1.12.C

TEKS 1.1.C Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.1.D** Work collaboratively with others by following agreed-upon rules for discussion, including listening to others, speaking when recognized, and making appropriate contributions; **TEKS 1.7.C** Use text evidence to support an appropriate response; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.11.E** Publish and share writing; **TEKS 1.12.C** Dictate or compose correspondence such as thank you notes or letters.

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud (10 min.)			
What Have We Already Learned?	Partner/ Whole Group	10 min.	❑ list of topics students have already learned about
Essential Background Information and Terms			
Read-Aloud (30 min.)			
Purpose for Listening	Whole Group	30 min.	❑ Flip Book: 7A-1–7A-10 ❑ ruler or yardstick
"Fossils"			
Comprehension Questions			
Word Work: *Preserved*			
This is a good opportunity to take a break.			
Application (20 min.)			
Syntactic Awareness Activity	Whole Group/ Partner	20 min.	❑ Letter Format Poster (Digital Components) ❑ writing paper
Friendly Letter: Fossils			

ADVANCE PREPARATION

Introducing the Read-Aloud

- Make a list of topics students have learned about for student pairs to discuss. Possible topics include rocks (you may wish to have one group for each type of rock), minerals, volcanoes, geysers, and layers of the earth (you may wish to have one group for each layer).

Application

- Prepare for students to use available digital tools to produce and publish their friendly letters.

Notes to Teacher

You may wish to note for students that Gerry the Geologist studies nonliving things that are related to the earth: rocks, minerals, volcanoes, and geysers. Pam the Paleontologist studies evidence of living things that are no longer living. Plants and animals are living things. Fossils are preserved examples of those living things that provide clues to what life was like on earth when those animals and plants were alive.

The purpose of the syntactic awareness activity is to help students understand the direct connection between grammatical structures and the meaning of text. The syntactic awareness activity should be used in conjunction with the complex text presented in the Read-Alouds.

Universal Access

- You may wish to gather images of a variety of fossils and dig sites where fossils have been found to share with students.

CORE VOCABULARY

fossil, n. the preserved imprint or body of a plant or animal that died many years ago
Example: The scientists found a large fish fossil.
Variation(s): fossils, fossilized, **adj.**

impression, n. the shape of something left on a surface due to pressure
Example: Their mother always knew when they jumped on the bed because of the impression their feet left on the mattress.
Variation(s): impressions

paleontologist, n. a scientist who studies evidence of life from long ago by looking at fossils
Example: As a paleontologist, she was able to travel to many different places to study fossils.
Variation(s): paleontologists

preserved, adj. kept in good condition over a long period of time
Example: The preserved fruits and vegetables last through most of the winter.
Variation(s): none

Vocabulary Chart for "Fossils"

Type	**Tier 3 Unit-Specific Words**	**Tier 2 General Academic Words**	**Tier 1 Everyday Speech Words**
Vocabulary	fossil (*fósil*) paleontologist (*paleontólogo*)	preserved (*preservado/a*)	
Multiple-Meaning		impression (*impresión*)	
Sayings and Phrases			

Lesson 7: Fossils

Introducing the Read-Aloud

10M

Speaking and Listening: Students will review characteristics of some of the earth's features.

TEKS 1.1.C; TEKS 1.1.D

WHAT HAVE WE ALREADY LEARNED? (5 MIN.)

- Read aloud the list you prepared in advance of topics that students have learned about.
- Pair students and have them choose one of the topics to discuss with their partner (e.g., rocks/types of rocks, minerals, volcanoes, geysers, layers of the earth). Students should discuss what they have learned about the topic.
- Have students give examples of good discussion, taking turns, and listening to others speak. You may wish to briefly model examples of these, as needed.
- When students have finished discussing the topics, say one of the topics aloud. Call on student pairs who discussed that topic to share one thing they discussed.
- If you find that a topic was not discussed by any students, ask students to share what they have learned about that topic.

ESSENTIAL BACKGROUND INFORMATION AND TERMS (5 MIN.)

Check for Understanding

Recall: What type of scientist is Gerry and what does he study? *(a geologist; rocks and what's inside the earth)*

EMERGENT BILINGUAL STUDENTS

Speaking and Listening

Exchanging Information and Ideas

Beginning
Ask students yes/no questions about a particular topic (e.g., "Does lava come out of geysers?").

Intermediate
Have students build on what the previous student said about a particular topic.

Advanced/Advanced High
Encourage students to say something more about what the previous student said about a particular topic.

ELPS 2.E; ELPS 2.G

TEKS 1.1.C Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.1.D** Work collaboratively with others by following agreed-upon rules for discussion, including listening to others, speaking when recognized, and making appropriate contributions.

- Tell students the things Gerry the Geologist studies are not living; they are not plants or animals.
- Explain that there are other scientists, called paleontologists, who study things that were living on the earth many years ago. Have students say the word *paleontologist* after you several times.
- Remind students that plants and animals are living things.
- Ask students to name plants or animals that live on the earth now. *(Answers may vary but may include general ideas like trees, flowers, birds, etc., or specific ideas like oak trees, pine trees, roses, lotus plants, beagles, tigers, etc.)*
- Tell them that today they will meet a friend of Gerry's who will tell them about plants and animals that lived on the earth many years ago.

Lesson 7: Fossils

Read-Aloud

30M

Reading: Students will explain how fossils provide information about animals and plants that lived long ago.

TEKS 1.7.C

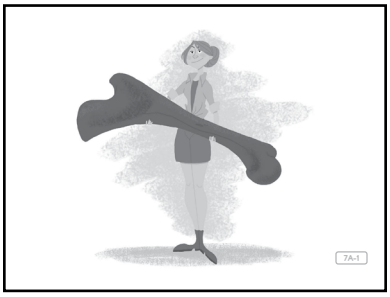
Language: Students will demonstrate understanding of the Tier 2 word *preserved*.

TEKS 1.3.B

PURPOSE FOR LISTENING

- Tell students to listen carefully to find out how paleontologists learn about plants and animals that lived on the earth many years ago.

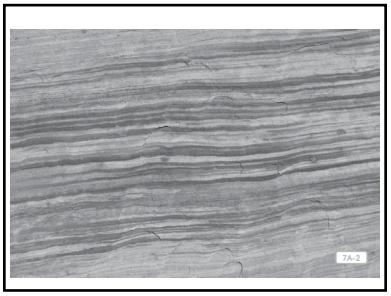
"FOSSILS" (15 MIN.)



Show Image 7A-1: Pam the Paleontologist
Hi everyone. My name is Pam and I am a **paleontologist**. *Let's call her "Pam the Paleontologist!"* Gerry the Geologist is a friend of mine. He called me this morning and asked me to come in and teach you some more about the earth. He is sorry he can't be here, but all this rock-talk has him itching to see some neat rocks himself, so he is off hiking in the mountains.

A paleontologist is a scientist who studies paleontology, which is the study of plants and animals that lived long ago. Can you say *paleontologist*? Paleontologists study evidence of life, like this bone, to learn about life on earth long ago. This isn't just any bone; it's a dinosaur bone! I'll be teaching you about dinosaurs in the near future.

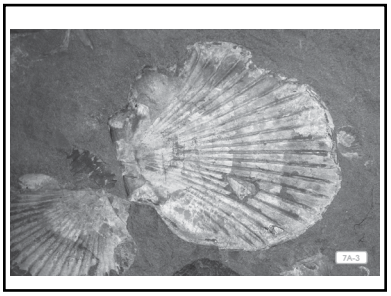
TEKS 1.7.C Use text evidence to support an appropriate response; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings.



Show Image 7A-2: Sedimentary rock
Gerry told me that you already know about basic geologic factors: heat, pressure, and time. You also know that sedimentary rocks such as sandstone and limestone are formed from layers of sediments that have been pressed together over time. *Sediments can be tiny pieces of dirt and rock, or even decayed plants and animals.* These layers of sediment offer many clues about plants and animals that used to be alive. The history of life on earth is my specialty as a paleontologist.

Check for Understanding

Use Evidence: What type of rock do you see in this picture? *(sedimentary rock)* How do you know? *(You can see the different layers of sediments that have been pressed together over time.)*



Show Image 7A-3: Fossilized shell
Paleontologists need to know a lot about rocks and geology in order to study evidence of ancient living things because of something called a **fossil**. A fossil is the **preserved** body or imprint of a plant or animal that lived many years ago. *Let's look at this image to help us better understand the meaning of the word* preserved. *If something is preserved, it is kept in good condition over a long period of time.* Most fossils, like this fossil of a seashell, show you where the body of an animal or plant died and was buried under layer after layer of sediment. Over many years, with more and more sediment pressing down on it, this shell became part of the stone that formed as a result of geologic pressure. You are only seeing the **impression**, or shape of it, not the actual shell. *Think of the shapes you can make when you push an object into clay—when you remove the object, the shape still remains in the clay!* The creature itself and its shell decayed and rotted away, but its shape stayed imprinted in the rock.

Show Image 7A-4: Fossil hunter

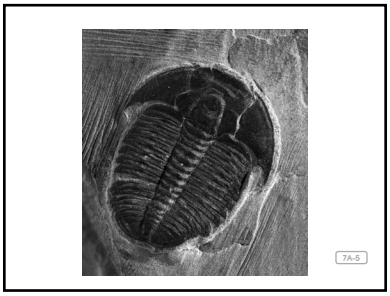
As you dig down into the earth, the soil and rocks are divided into layers. These layers represent different geologic periods, or times during which the crust and surface of the earth changed. For instance, if you find a layer of sandstone on dry land, then you know that there may have been an ocean or river over the land at some point in the distant past. *That means that by examining rocks in our area, scientists can tell if there used to be an ocean where our city is now and how long ago that was.* We can estimate how old certain fossils may be, thanks to our understanding of geology and rock layers.

Fossils are usually found in layers of sedimentary rocks, though they can be found in other rock formations as well. It looks like the paleontologist in this picture has found a good place for fossil hunting. He has to dig very carefully to make sure he keeps the fossils in good condition.

Challenge

Have students describe other timelines they have worked with (e.g., timeline of the Maya, Inca, and Aztec civilizations).

Every fossil is part of the earth's fossil record. The fossil record includes everything we have learned about the history of life from studying fossils. The fossil record is what paleontologists study in order to figure out what life on earth was like many years ago. Paleontologists can estimate when the animals and plants imprinted in the fossils lived based on the rock layers in which they were found. They use information from all fossils to propose a timeline of life on earth. *A timeline of life on earth shows a possible order in which plants and animals existed, from long ago to today.* Today, I would like to show you several different fossils from different geologic periods on earth.

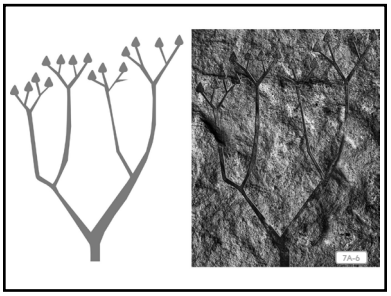


Show Image 7A-5: Trilobite

This is a fossil of a trilobite, an animal that some scientists think lived long ago. Trilobites may look like insects, but they are more closely related to lobsters and crabs. Trilobites came in many varieties, from a half-inch up to twenty-eight inches in length. *[Show these lengths with a ruler or yardstick.]* They had antennas, lots of legs, and a hard outer shell called an exoskeleton. That exoskeleton is important because it meant that dead trilobites were easily fossilized when they became buried in the sand.

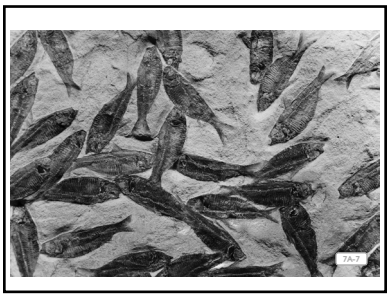
Support

Explain that the exoskeleton, or hard outer shell, of trilobites helped preserve their remains because it protected the remains from wear over time. Students may recognize beetles, ants, lobsters, and scorpions as animals with exoskeletons.



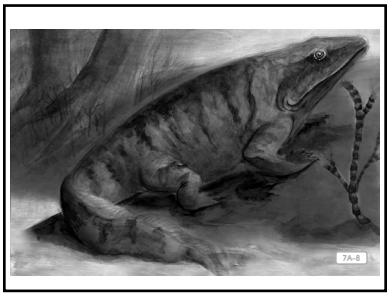
Show Image 7A-6: *Cooksonia* fossil

The fossil record estimates that the first plants appeared on land about the same time. Back then, there was no soil on the land, because soil contains dead, decayed plants. Since these were the first plants on land, no plants had yet died in order to create soil. The first plants did not have the same characteristics as plants today. These plants were less than half an inch tall and they had no roots, leaves, flowers, or seeds, but they were plants nevertheless. *[Show the height of less than half an inch with a ruler or yardstick.]*



Show Image 7A-7: Fish fossils

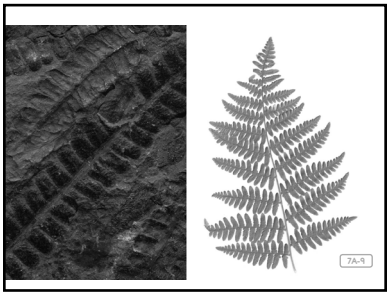
Soon came the Age of Fish. Many different types of fish ruled the waters—types of fish we don't see in the waters today.



Show Image 7A-8: Tetrapod re-creation

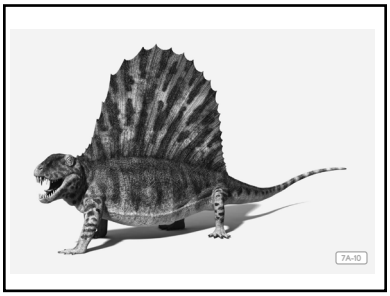
Also during this time, plant and animal life on land began to spread rapidly. The first soils developed on land, allowing new types of plants with leaves, stems, and roots to grow. With new plants came new land creatures ready to eat those plants. Tetrapods, the first amphibians, made their way onto the beaches. An amphibian is an animal, such as a frog, that lives part of its life in water and part on land.

Paleontologists have found many tetrapod fossils. An artist drew this picture using a tetrapod fossil, which shows what a real tetrapod might have looked like. Do you think any of this tetrapod's body parts look like they belong to a fish? *[Pause for students to answer.]*



Show Image 7A-9: Fern fossil

Then, lush forests full of trees and plants, such as ferns, began to grow.



Show Image 7A-10: First reptiles

As forests increased, so too did the variety and sizes of animals. The first giant reptiles appeared. Of course, the one in this picture—called a dimetrodon—is just a model that someone made, but they based this model on fossilized dimetrodon bones found in the earth. Paleontologists call the body part sticking up on its back a sail because it looks like the sail on a boat.

The dimetrodon was not a dinosaur, but it certainly looked like one, and dinosaurs were soon to follow. We will learn more about dinosaurs next time. That is as far as the fossil record will take us today!

COMPREHENSION QUESTIONS (10 MIN.)

1. **Literal.** What is a fossil? *(A fossil is the preserved body or imprint of a plant or animal that lived long ago.)*
2. **Literal.** Are fossils formed over a short period of time or a long period of time? *(Fossils are formed over a long period of time.)*

Check for Understanding

Use an Image: [Show Image 7A-6: *Cooksonia* fossil.] What does this fossil tell us about life on earth long ago? *(Plants long ago did not have roots, leaves, flowers, or seeds like plants today.)* [Show Image 7A-7: Fish fossils.] What does this fossil tell us about life on earth long ago? *(There were different kinds of fish long ago than there are today.)*

3. **Evaluative.** What do paleontologists study? *(Paleontologists study animals and plants that lived long ago.)* How is the work of paleontologists similar to that of geologists? *(Answers may vary, but may include: paleontologists and geologists are both interested in studying rock layers.)* How is it different? *(Paleontologists study things that lived on the earth long ago, including plants and animals; geologists study nonliving things such as rocks, volcanoes, layers of the earth, etc.)*

WORD WORK: PRESERVED (5 MIN.)

1. In the Read-Aloud you heard, "A fossil is the preserved body or imprint of a plant or animal that lived long ago."
2. Say the word *preserved* with me.
3. If something is *preserved*, it is kept in good condition over a long period of time.
4. My mother preserved the pictures by putting them in a photo album.
5. Why is it important that things be preserved? Try to use the word *preserved* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "_____ should be preserved because . . ."]
6. What's the word we've been talking about?

EMERGENT BILINGUAL STUDENTS

Reading

Reading/Viewing Closely

Beginning
Ask students simple yes/no questions (e.g., "Do geologists and paleontologists both study things that lived on the earth long ago?").

Intermediate
Provide students with a specific sentence frame (e.g., "Paleontologists study ___ while geologists study ___.").

Advanced/Advanced High
Encourage students to use key details in complete sentences (e.g., Paleontologists study things that lived long ago, while geologist study nonliving things from long ago.

ELPS 2.G; ELPS 4.G

Use a Making Choices activity for follow-up. I will describe some things. If I describe something that is preserved, say "That is preserved." If I do not describe something that is not preserved, say "That is not preserved."

- fruit picked during the summer and put in tightly sealed jars for the winter *(That is preserved.)*
- trash on the sidewalk that got wet in the rain *(That is not preserved.)*
- the fossil of a seashell *(That is preserved.)*
- a bike left outside in the yard *(That is not preserved.)*
- a fern fossil found imprinted in a rock *(That is preserved.)*

Lesson 7: Fossils

Application

20M

Writing: With assistance, students will dictate or write a letter about fossils.

TEKS 1.11.E; TEKS 1.12.C

SYNTACTIC AWARENESS ACTIVITY (5 MIN.)

Conjunction *Or*

- Remind students that a conjunction is a kind of word used to connect words and phrases.
- Remind students they learned about the conjunction ***and*** in a previous lesson. Ask students to explain what the conjunction ***and*** connects. (***And*** is used to join words and phrases that share similar ideas, or ideas that are alike.)
- Explain that the conjunction ***or*** is used to join words and phrases that are choices.
- Read aloud the following excerpt from the Read-Aloud. Note that you will emphasize the word ***or*** as you read:

  *A fossil is the preserved body **or** imprint of a plant **or** animal that lived long ago.*

- Note that in this excerpt, the word ***or*** is used to talk about two or more possibilities or choices.
- Explain that the word ***or*** is used a lot when making choices. Share the following example with students:
  - Would you like a red crayon ***or*** a blue crayon?
- Point out that the word ***or*** tells us that we must choose only one crayon.
- Share the following example with students:
  - Do you prefer chocolate ice cream ***or*** vanilla ice cream?
- Point out that the word ***or*** tells us that we must make a choice and select only one ice cream flavor.

Support

There may be variations in the sentences created by your class. Allow for these variations and restate students' sentences so that they are grammatically correct.

TEKS 1.11.E Publish and share writing; **TEKS 1.12.C** Dictate or compose correspondence such as thank you notes or letters.

- Tell students you will read them some questions. Explain that students must select one of the choices and explain to a partner why they chose it. Remind students to answer in complete sentences.
  - Do you like hot weather ***or*** cold weather better?
  - Would you rather eat an apple ***or*** an orange?
  - Would you rather play soccer ***or*** basketball?

Check for Understanding

Explain It: What is the conjunction ***or*** used for? *(to join words and phrases that are choices)*

FRIENDLY LETTER: FOSSILS (15 MIN.)

- Remind students that they wrote a letter in an earlier lesson. Ask students to recall who the letter was to and what it was about. *(The letter was to Gerry the Geologist, telling him what students had learned about the earth's crust.)*
- Explain that today students will write a friendly letter to Pam the Paleontologist about fossils.
- Explore various digital tools with students to produce and publish their letters. Such tools may include various student-publishing software and web-based publishing programs.
- Review the parts of a letter using the Letter Format poster on display, pointing to the appropriate part on the poster. Explain that students are not expected to be able to read the poster because they are still learning all the rules for decoding. Emphasize that you will read the information to them.
  - greeting: the opening words and often the name of the person or people the letter is to
  - body: all the writer's thoughts
  - closing: the words used to finish the letter
  - signature: the writer's name

- Ask students to share what they learned about fossils. You may wish to record student answers on the board or chart paper. *(Answers may vary, but may include: fossils are the preserved imprints or bodies of plants or animals that lived long ago; paleontologists study fossils to learn about plants or animals that are no longer living; sedimentary rock often holds clues about plants and animals that used to live on earth in its sediments; most fossils show where a plant or animal died and was buried under layers of sediment; fossils are usually found in sedimentary rock; etc.)*
- Tell students you will work together to start a letter to Pam the Paleontologist about what they have learned about fossils. They will finish the letter with a partner. As an alternative option, ask students to dictate the letter as you write it.
- Explain that because you are writing a letter to Pam the Paleontologist, the greeting is *Dear Pam,*. Write the greeting on the board or chart paper.
- Referencing the list you created together about what students have learned about fossils, have students help you create an opening sentence (e.g., "You helped us learn a lot of fossils!").
- Record the sentence under the greeting.
- Then, have students work in pairs to type the greeting and opening sentence. Students will then complete the letter with their partners.
- Remind students of the items you recorded on the list of things they learned about fossils.
- Also remind students to include the remaining parts of the letter: the rest of the body, the closing, and the signature.
- Circulate around the room, offering guidance and support as needed.
- Have student pairs share their letters with other pairs or with the entire class.

End Lesson

Support

Have students dictate sentences to an adult to complete their letter.

Challenge

Have students who are ready write a letter independently.

EMERGENT BILINGUAL STUDENTS

Writing

Interacting via Written English

Beginning
Have students create sentences about fossils using familiar vocabulary and dictate the sentences to a teacher to be recorded.

Intermediate
Have students create sentences about fossils using familiar vocabulary and dictate the sentences to a peer to be recorded.

Advanced/Advanced High
Have students independently write sentences about fossils using familiar vocabulary.

ELPS 5.B

LESSON

8

THIS PLANET ROCKS

Dinosaurs

PRIMARY FOCUS OF LESSON

Speaking and Listening

Students will review how paleontologists and fossils are related.

TEKS 1.1.C

Reading

Students will explain how we know about dinosaurs.

TEKS 1.6.G

Language

Students will demonstrate understanding of the Tier 3 word *extinct*.

TEKS 1.3.B; TEKS 1.6.E

Writing

With assistance, students will dictate or write a letter about dinosaurs.

TEKS 1.3.B; TEKS 1.11.E; TEKS 1.12.C

FORMATIVE ASSESSMENT

Friendly Letter

Students will dictate or write a letter using information they learned about dinosaurs.

TEKS 1.12.C

TEKS 1.1.C Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language; **TEKS 1.6.G** Evaluate details to determine what is most important with adult assistance; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.6.E** Make connections to personal experiences, ideas in other texts, and society with adult assistance; **TEKS 1.11.E** Publish and share writing; **TEKS 1.12.C** Dictate or compose correspondence such as thank you notes or letters.

LESSON AT A GLANCE

	Grouping	Time	Materials
Introducing the Read-Aloud (10 min.)			
What Have We Already Learned?	Whole Group	10 min.	❑ Image Cards 10–13
Read-Aloud (30 min.)			
Purpose for Listening	Whole Group	30 min.	❑ Flip Book: 8A-1–8A-11 ❑ U.S. map ❑ yardstick
"Dinosaurs"			
Comprehension Questions			
Word Work: *Extinct*			
This is a good opportunity to take a break.			
Application (20 min.)			
Multiple-Meaning Word Activity: *Plate*	Whole Group/ Partner	20 min.	❑ Poster 4M: Plate (Flip Book) ❑ Letter Format Poster (Digital Components) ❑ board/chart paper (optional) ❑ writing paper
Friendly Letter: Dinosaurs			

ADVANCE PREPARATION

Introducing the Read-Aloud

- Prepare to divide students into four groups.

Application

- Prepare for students to use digital tools to produce and publish their friendly letters.

Universal Access

- You may wish to gather images of a variety of dinosaurs to share with students.

CORE VOCABULARY

debris, n. bits and pieces of objects that have been scattered
Example: Debris from the broken canoe floated down the river.
Variation(s): none

excavating, v. digging up
Example: Archaeologists and paleontologists have lots of experience excavating objects from long ago.
Variation(s): excavate, excavates, excavated

extinct, adj. when a type of organism is no longer living or existing
Example: Dinosaurs are extinct.
Variation(s): extinction, **n.**

meteorite, n. a piece of rock that falls from space to the earth's surface
Example: A meteorite was found in the desert.
Variation(s): meteorites

meteors, n. pieces of rock from space that usually burn up as they enter the earth's atmosphere
Example: The meteors left bright trails as they streaked through the sky.
Variation(s): meteor

Vocabulary Chart for "Dinosaurs"

Type	**Tier 3 Unit-Specific Words**	**Tier 2 General Academic Words**	**Tier 1 Everyday Speech Words**
Vocabulary	excavating extinct (*extinto/a*) meteorite (*meteorito*) meteors (*meteoros*)	debris	
Multiple-Meaning			
Sayings and Phrases	whatever the case may be remains to be seen		

Lesson 8: Dinosaurs

Introducing the Read-Aloud

10M

Speaking and Listening: Students will review how paleontologists and fossils are related.

TEKS 1.1.C

WHAT HAVE WE ALREADY LEARNED? (10 MIN.)

- Review with students that a fossil can be either the preserved body or the imprint of a plant or animal that lived long ago.

Check for Understanding

Vocabulary: What is a paleontologist? *(a scientist who studies living things from long ago by looking at fossils)*

- Explain that even though paleontologists are interested in the history of life on Earth, they still need to know a lot about geology in order to estimate how old fossils are and where they fit in the history of life on Earth.
- Remind students that the soil and rocks are divided into layers, and that the layers represent different geologic periods, or times, when changes happened to the crust of the earth.
- Tell students that scientists estimate how old certain fossils are based on their understanding of geology and rock layers.
- Divide students into four groups. Give each group an Image Card.
- Have each group discuss what is on the provided Image Card and be prepared to describe the image to the class.
- Tell them they will need to identify what the image is, describe details in the image, and add information recalled from the Read-Aloud related to the image.

TEKS 1.1.C Share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language.

Image Cards 10–13

- Ask each group to describe their Image Card to the class. For reference, the Image Cards are as follows:
  - Image Card 10 is a trilobite. It looks like an insect but is more closely related to lobsters and crabs. They came in many varieties and lengths. They had antennas, lots of legs, and a hard outer shell called an exoskeleton.
  - Image Card 11 is a plant fossil *(Cooksonia)*. There was no soil yet when the first plants appeared on land because no other plants had died in order to create soil. These first plants were less than an inch tall and had no roots, leaves, flowers, or seeds.
  - Image Card 12 is fish fossils. Many types of fish were found in waters on the earth.
  - Image Card 13 is a fern fossil. Forests full of trees and plants, such as ferns, began to grow after the first soils developed on land.
- Use the Image Cards to talk about the order in which these living things inhabited the earth. [The order they are numbered is the order they inhabited the earth.]

EMERGENT BILINGUAL STUDENTS

Speaking and Listening

Presenting

Beginning
Have students use phrases and familiar vocabulary to describe their Image Card.

Intermediate
Have students describe their Image Card using short sentences.

Advanced/Advanced High
Have students describe their Image Card using longer, more detailed sentences.

ELPS 3.H; ELPS 3.J

Lesson 8: Dinosaurs

Read-Aloud

30M

Reading: Students will explain how we know about dinosaurs.

TEKS 1.6.G

Language: Students will demonstrate understanding of the Tier 3 word *extinct*.

TEKS 1.3.B; TEKS 1.6.E

PURPOSE FOR LISTENING

- Tell students to listen carefully to learn how we know about dinosaurs.

"DINOSAURS" (15 MIN.)

Hey there, fellow scientists! It's Pam the Paleontologist again. Last time I was here, I gave you a whirlwind tour of the history of life on Earth right up through the time of the dimetrodons, the first giant reptiles that had big sails on their backs. The time when the dimetrodons lived was followed by a time known as the Age of Reptiles.

Show Image 8A-1: Tyrannosaurus Rex skeleton

This is the skeleton of a Tyrannosaurus Rex, or *T. rex*, as some people call it. It was one of the largest and most fearsome predators ever to walk the earth. *A predator is an animal that eats other animals.* We can tell by its teeth that the *T. rex* was a meat eater. We also know that it was over forty feet long and up to twenty feet tall. Judging by the size of its bones, it weighed about seven tons, or more than two average-sized cars combined.

TEKS 1.6.G Evaluate details to determine what is most important with adult assistance; **TEKS 1.3.B** Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.6.E** Make connections to personal experiences, ideas in other texts, and society with adult assistance.

Support

The word *plate* can also mean a flat, often round, dish that food is placed on for serving or eating.

Show Image 8A-2: *T. rex* and Triceratops

How are these two dinosaurs alike, and how are they different?

This painting shows *T. rex* facing off against a triceratops, a dinosaur with long horns and a shield-like plate on its head. *Here, the word* plate *means a flat, hard piece that covers the bodies of some animals.* Keep in mind when you look at artwork like this that nobody today really knows what dinosaurs looked like. We have only seen their bones and some impressions of their skin. Artists use information supplied by scientists today to try to make good guesses about what dinosaurs looked like when they were alive. Scientists do all this based on dinosaur bones and some impressions of their skin! Many people think of dinosaurs as giant reptiles, and, in fact, the word *dinosaur* means "terrifying lizard." However, many paleontologists now think that dinosaurs are more closely related to birds than they are to lizards. Whatever the case may be, there are no dinosaurs on Earth anymore. They have all been **extinct**—dead and gone—for many years. Now there are just fossilized bones of dinosaurs buried in the earth's crust.

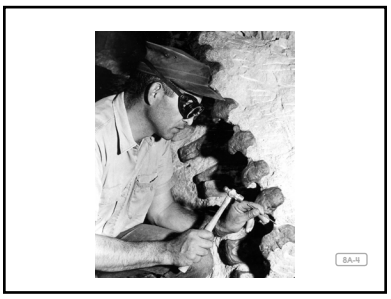
Check for Understanding

Thumbs-Up/Thumbs-Down: If something is extinct, is it around today? *(no; thumbs-down)*

Show Image 8A-3: Stegosaurus

How would you describe this dinosaur?

Here is my personal favorite: the stegosaurus. Like the triceratops, the stegosaurus was an herbivore, or plant eater, but it had some pretty good ways of defending itself against meat eaters. Stegosaurus had hard, sharp plates on its back, which would have made it difficult to bite. But just in case anyone tried, the stegosaurus also had a spiky tail that could really do some damage.



Show Image 8A-4: Excavating dinosaur bones

How do we find and learn about these incredible animals? Scientists look for their fossilized bones, which can be found in many parts of the world, including the United States. *If something is fossilized, that means over a long period of time it came to be like a fossil.* Dinosaur fossils are hard to find, and **excavating**—or digging up—their bones is not as easy as you might think.

Once paleontologists find an area that is likely to have dinosaur bones, we move in with our tools and begin careful excavation. Paleontologists must use sharp little knives and small brushes to gradually scrape away the sedimentary rock surrounding the fossils. It will take this paleontologist days and maybe even weeks to excavate this one bone. It's slow work, but to me there is nothing more exciting in the world than carefully uncovering a bone that may teach us about life long ago.

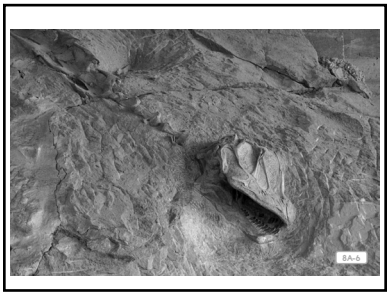
Show Image 8A-5: Large excavation

Here a paleontologist is excavating a large collection of bones from the sandstone cliffs of Dinosaur National Monument, an area located in the states of Colorado and Utah, where we have uncovered hundreds and thousands of dinosaur bones. *[Locate Colorado and Utah on a U.S. map for students.]*

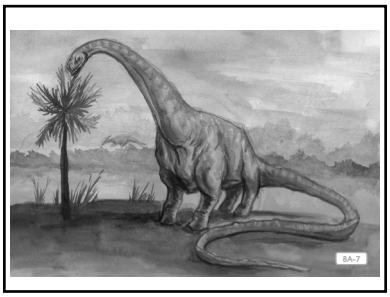
Can you see all the bones in this picture? That was one big dinosaur! But what did it really look like? It's hard to tell because, over time, the bones have moved around and become broken. As a paleontologist, I sometimes feel like I spend half my life putting puzzles together. Often we only find a few bones—the rest of the skeleton was long since destroyed or perhaps even dragged away by a predator many years ago. Other times, lots of different dinosaur bones can be mixed in together. We paleontologists have to use our detective skills to figure out which bones belonged to which type of dinosaur.

Challenge

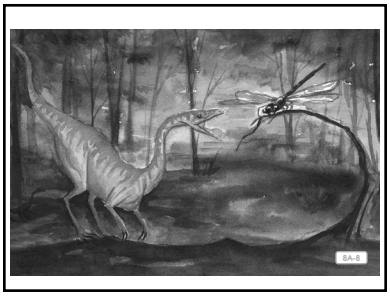
Have students explain why paleontologists must work very carefully to excavate bones and why excavation may take a very long time.



Show Image 8A-6: Excavating *Camarasaurus*
In fact, those bones belonged to a mighty *Camarasaurus*. I knew as soon as I saw its head. This plant eater was sixty feet long and weighed about twenty tons. A real whopper! *A ton is a unit of weight equal to 2,000 pounds. That means this dinosaur weighed the same amount as 10 cars when it was alive! [Show students a yardstick and tell them that this dinosaur was as long as twenty yardsticks.]*



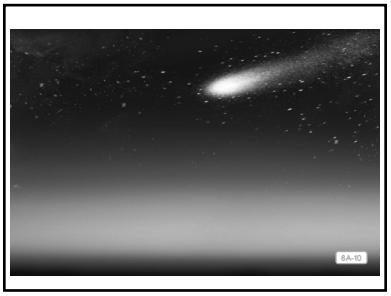
Show Image 8A-7: *Camarasaurus*
Here is one artist's idea of what the *Camarasaurus* looked like. It could use its long tail to fend off predators. Good thing you don't have to worry about these things anymore!



Show Image 8A-8: *Compsognathus*
How would you describe this dinosaur?

Not all dinosaurs were huge. In fact, some were really small. Take the *Compsognathus*. This little critter stood just two feet tall and scurried around on two little bird-like legs. *Two feet is less than the length of one yardstick.* *Compsognathus* was a meat eater that fed on little lizards. We know this because paleontologists found parts of a fossilized lizard in the stomach cavity of a *Compsognathus* fossil.

Show Image 8A-9: *Tyrannosaurus rex* skeleton
What happened to the dinosaurs? You can't go and see a live *T. rex* today at the zoo because dinosaurs are extinct. *Remember, extinct means that there are no more left.* According to fossil records, the extinction of the dinosaurs was quite sudden. Why? That's something paleontologists have been trying to answer ever since the first dinosaur bones were discovered and identified nearly two hundred years ago.



Show Image 8A-10: Meteor

For years, many scientists thought that extraordinary geologic events, such as super volcanoes, must have had something to do with it. These days, however, many scientists now think that the dinosaur extinction was caused by a giant **meteorite** from outer space. *A meteorite is a piece of rock that falls from space to the earth's surface.* There are billions of **meteors**, or burning chunks of **debris** in outer space. Some meteors are quite large, but most are tiny, between the size of a sand grain and a baseball. Meteors are whizzing around all over the place in outer space. Occasionally, a meteor crashes toward Earth. When this happens, the meteor hits the atmosphere at an incredible speed and usually burns up as it enters the uppermost parts of Earth's atmosphere. *[Remind students that they learned in the* Astronomy: Space Exploration *unit that this burning up of meteors creates a streak of light in the night sky that some people think is a shooting star.]* Occasionally, bits and pieces of meteors survive their trip through the atmosphere and actually fall to earth. This is very rare, but it does happen from time to time, and it is possible to find pieces of them on the ground. When part of a meteor survives the trip through the atmosphere and lands on Earth, the meteor becomes a meteorite, or space rock that has landed on Earth.

Show Image 8A-11: Recovered meteorite

Now, let's go back to dinosaur extinction. Some scientists think that the dinosaur extinction was caused by a giant meteorite from outer space. When the meteorite struck the earth, it sent massive plumes, *or clouds*, of debris up into the atmosphere. *That means it sent large amounts of bits and pieces of objects from the earth up into the atmosphere.* This debris would have blocked out the light and energy of the sun, causing much of Earth's plant life to die and severely lowering the temperature. Most creatures at the time would have been unable to adapt, and they would have died out before the skies had a chance to clear.

Whether this is true or not remains to be seen, though geologists have discovered at least one very large crater that was caused by a meteorite impact about the time the dinosaurs became extinct. Whatever the case, we know that dinosaurs became extinct, making way for new kinds of life on Earth. I, for one, will continue to study the earth's fossil record, and I am sure we will find the answer some day, because the clues about how the dinosaurs died are all there in the rocks. Ask my friend Gerry the Geologist, and he will tell you the same thing!

COMPREHENSION QUESTIONS (10 MIN.)

Check for Understanding

Use Evidence: How do we know about dinosaurs? *(We know about dinosaurs because of the work of scientists. They dig for fossils and examine fossilized dinosaur bones. They use that evidence to try and recreate what dinosaurs looked like and to help with understanding how and where dinosaurs lived and how they died.)*

1. **Literal.** What does it mean when someone says that dinosaurs are extinct? *(When someone says that dinosaurs are extinct, it means that there are no living dinosaurs left.)* How do we know anything about dinosaurs if they are extinct? *(Paleontologists have found and studied fossilized dinosaur bones.)*
2. **Inferential.** Do we know what dinosaurs really looked like? *(No, we do not know what dinosaurs really looked like.)* Why not? *(Dinosaurs are extinct. They lived many years ago, and only their bones have been found.)*
   - **Inferential.** How can we guess what dinosaurs looked like? *(Paleontologists use excavated dinosaur bones to try and determine what many dinosaurs may have looked like.)*
3. **Evaluative.** What do some scientists think caused dinosaurs to become extinct? *(Some scientists think a meteorite caused dinosaurs to become extinct.)* Do you think scientists will ever be sure? Why or why not? *(Answers may vary.)*

EMERGENT BILINGUAL STUDENTS

Speaking and Listening

Supporting Opinions

Beginning
Provide students with a simple sentence frame and an oral word bank (e.g., "I think scientists will/will not be sure because . . ." and words such as *extinct*, *fossils*, *dig up*, *puzzle*.).

Intermediate
Provide students with an open-ended sentence frame (e.g., "I think scientists . . . ").

Advanced/Advanced High
Provide minimal support for open responses and encourage students to use key details from the text.

ELPS 3.G

WORD WORK: EXTINCT (5 MIN.)

1. In the Read-Aloud you heard, "[Dinosaurs] have all been extinct—dead and gone—for many years."
2. Say the word *extinct* with me.
3. If a plant or an animal is *extinct*, there are none living or left on the earth.
4. Some animals are protected so that they don't become extinct.
5. Are there some animals that you think are in danger of becoming extinct? What can we do to protect animals today from becoming extinct? Try to use the word *extinct* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "We can protect animals today from becoming extinct by . . ."]
6. What's the word we've been talking about?

Use a Discussion activity for follow-up. Think about how the earth today may be different if dinosaurs were not extinct. How would the work of paleontologists and geologists be the same or different from what they do now? How might your life be different if dinosaurs were not extinct? Be sure to use the word *extinct* and answer in complete sentences.

Flip Book Poster 4M

EMERGENT BILINGUAL STUDENTS

Language

Analyzing Language Choices

Beginning
Ask questions students can answer by pointing to the appropriate image on the poster (e.g., "Which image shows a plate that holds your food while you eat?").

Intermediate
Ask students to provide examples of items related to each meaning of *plate* (e.g., other animals with plates on their bodies, paper plates, decorative plates that aren't for food).

Advanced/Advanced High
Have students use each meaning correctly.

ELPS 1.F

Lesson 8: Dinosaurs

Application

20M

Writing: With assistance, students will dictate or write a letter about fossils.

TEKS 1.3.B; TEKS 1.11.E; TEKS 1.12.C

MULTIPLE-MEANING WORD ACTIVITY: PLATE (5 MIN.)

Show Poster 4M (Plate)

- Tell students in the Read-Aloud they heard, "This painting shows *T. rex* facing off against a triceratops, a dinosaur with long horns and a shield-like plate on its head."
- Explain that in this sentence, *plate* means a flat, hard piece that covers the bodies of some animals.
- Have students hold up one or two fingers to indicate which image on the poster shows this meaning. *(one finger)*
- Explain that *plate* can also mean a flat, often round, dish that food is placed on for serving or eating.
- Have students hold up one or two fingers to indicate which image on the poster shows this meaning. *(two fingers)*
- With a partner, have students make a sentence for each meaning of *plate*. Tell them you will call on a few partners to share what they came up with. Remind them to answer in complete sentences. *(A stegosaurus has plates all along its back. I help my mom rinse plates before putting them in the dishwasher.)*

FRIENDLY LETTER: DINOSAURS (15 MIN.)

- Ask students to describe the parts of the letter as you point to each part on the Letter Format poster. Provide hints as needed.
- Ask different students to describe the letters they wrote to Pam the Paleontologist about fossils. *(Answers may vary.)*
- Explain that today students will use digital tools to write a letter about dinosaurs. Explain that together you will discuss starting the letter and then students will write it with a partner.

TEKS 1.3.B Use illustrations and texts the student is able to read or hear to learn or clarify word meanings; **TEKS 1.11.E** Publish and share writing; **TEKS 1.12.C** Dictate or compose correspondence such as thank you notes or letters.

- Ask students to share what they learned about dinosaurs. You may wish to record student answers on the board or chart paper. *(Answers may vary but may include: nobody really knows what dinosaurs looked like—people have only seen their bones; scientists use dinosaur bones to guess what dinosaurs looked like; dinosaurs are extinct; paleontologists dig for dinosaur bones; etc.)*
- Tell students to think about who they want to write a letter to, telling what they learned about dinosaurs. That person's name should be in the greeting as *Dear _____,*.
- Remind students to start their letter with an opening sentence, which will probably be about dinosaurs in general. Discuss possible opening sentences. You may wish to record students' ideas on the board or chart paper.
- Also remind students to reference the list you created together about dinosaurs for ideas about what else to include in the letter.
- Then, have students work in pairs to write/type the letter. As an alternative option, have students dictate the letter as you write it.
- Remind students to include the remaining parts of the letter: the rest of the body, the closing, and the signature.
- Circulate around the room, offering guidance and support as needed.
- Have student pairs share their letters with other pairs or in small groups.

End Lesson

Challenge

Have students who are ready write a letter independently.

Support

Have students dictate sentences to an adult to complete their letter.

Grade 1 | Unit 5

Unit Review

NOTE TO TEACHER

You should spend one day reviewing, reinforcing, or extending the material taught so far. You may have students do any combination of the activities provided, in either whole-group or small-group settings.

CORE CONTENT OBJECTIVES ADDRESSED IN THIS UNIT

Students will:

- Explain that different scientists study the different kinds of rocks that make up the earth
- Identify geographical features of the earth's surface: oceans and continents
- Locate the North Pole, the South Pole, and the equator on a globe
- Describe the shape of the earth
- Identify and describe the layers of the earth: crust, mantle, and core (outer and inner)
- Describe how heat, pressure, and time cause many changes inside the earth
- Describe volcanoes
- Describe geysers
- Identify common minerals in the earth
- Explain how minerals are used by people
- Identify the three types of rocks: igneous, sedimentary, and metamorphic
- Describe how heat, pressure, and time cause the formation of igneous, sedimentary, and metamorphic rocks
- Describe fossils
- Explain how fossils provide information about the animals and plants that lived long ago
- Explain how we know about dinosaurs

REVIEW ACTIVITIES

Image Review

- Show the Flip Book images from any Read-Aloud again and have students retell the Read-Aloud using the images.

Image Card Review

Materials: Image Cards 10–14

- Divide the class into five groups. Give each group one of the Image Cards.
- Give the groups a few minutes to brainstorm everything they remember about the Image Card.
- Then come together as a class and give each group a chance to share.

Image Cards 10–14

Student Choice

- Have a student select a Read-Aloud to be heard again.

Fossils

Materials: Clay, objects with distinct shapes to press into the clay

- Have students create their own fossils by pressing common objects such as plastic dinosaurs, etc., into clay.
- Have students remove the object and allow the clay to harden for a few hours.
- Have students discuss what the imprint left in the clay could tell someone who has never seen the actual object.
- You may also find directions on various websites for more sophisticated projects.
- Be sure to talk about what fossils are, how they are formed, and what information they give.

Key Vocabulary Brainstorming

Materials: Board/chart paper

- Give students a key unit concept or vocabulary word, such as *fossil*.
- Have them brainstorm everything that comes to mind when they hear the word (e.g., trilobite, dinosaur bones, etc.)
- Record their responses on the board or chart paper for reference.

Riddles for Core Content

Image Cards 1–9, 14

Materials: Image Cards 1–9 and 14

- Divide the class into five groups. Give each group two Image Cards.
- Ask the group to look at and name their Image Cards.
- Invite each group to show the class their Image Cards and name the images. Tell the students to listen carefully to the following riddles.
- If their Image Card is the answer to the riddle, the members of the group should stand up and say, "I am [insert name of image]". If their Image Card is not the answer, they should stay seated.
  - I shoot out steam heated from deep within the earth. What am I? (*I am a geyser.)* [Group members show Image Card 6 (geyser).]
  - I am a type of rock that is formed from hot magma or lava that cools and hardens. What am I? *(I am igneous rock.)* [Group members show Image Card 7 (igneous rock)]
  - Some people measure me with a clock, but I cannot be seen. What am I? *(I am time.)* [Group members show Image Card 3 (time).]
  - I shoot gooey rock from the outer core through cracks in the mantle due to pressure and heat. When my gooey rock or magma hits the earth's crust, it cools and we call it lava. What am I? *(I am a volcano.)* [Group members show Image Card 5 (volcano)].
  - I am a rock that forms in layers. Sometimes you can find fossils in my layers. What am I? *(I am sedimentary rock.)* [Group members show Image Card 8 (sedimentary rock)].
  - I have layers, like a bed, but I am shaped like a ball. People and animals live on my crust. What am I? *(I am Earth.)* [Group members show Image Card 4 (Earth's layers)].
  - I come in many forms. You can feel me when you stand outside on a sunny day or put your hand near a warm radiator. What am I? (*I am heat.)* [Group members show Image Card 1 (heat)].

Rock Cycle Song (Tune: Row, Row, Row Your Boat)

Sedimentary rock
has been formed in layers—
Often found near water sources
a bumpy part of nature.

Then there's igneous rock,
here since Earth was born.
molten lava, cooled and hardened—
that is how it's formed.

These two types of rocks
can also be transformed;
with pressure, heat, and time
metamorphic they'll become.

Class Book: This Planet Rocks

Materials: Paper, drawing tools

- Tell the class or a group of students that they are going to make a class book to help them remember what they have learned in this unit.
- Have students brainstorm important information about fossils, dinosaurs, and paleontologists.
- Have each student choose one idea, draw a picture of it, and then write a caption for it.
- Bind the pages to make a book to put in the class library for students to read again and again.

Heat, Pressure, and Time

Materials: Image Cards 1–3

- Give three students the Image Cards for heat, pressure, and time. Review what the Image Cards represent.
- Have the three students stand in various locations around the room.
- Tell the class that you are going to say a word. They will decide how heat, pressure, or time are connected to the word, and then walk to and stand with the person holding that Image Card.
- After students have walked to the various locations, have them explain how the two words are connected. For example:
  - If you say the word *fossil*, one student may walk to the Image Card of "pressure" and say, "It takes pressure to form a fossil."

Image Cards 1–3

- A second student may walk to the Image Card of "time" and say, "It takes a very long time for a fossil to form."

- Another variation is to use the signals explained in the Pausing Point.

Letter to a Geologist or Paleontologist

Materials: Writing paper, writing tools

- As a class, brainstorm ideas and then write a letter to Gerry, a real geologist, Pam, or a real paleontologist. Students may talk about the cool things that geologists or paleontologists do or ask questions they still have about the earth.

- You may also ask students to write individual letters if they are ready to do this activity on their own.

Idea Webs

Materials: Chart paper, markers, tape

- Draw a large circle in the middle of five large pieces of chart paper.

- Write the following terms in the center of the circles, one term per circle: *dinosaurs*, *Earth's layers*, *rocks, minerals*, or *volcano/geyser*.

- Divide students into five groups. Give each group an idea web.

- Have students brainstorm everything that comes to mind when they hear the word on the center of their idea web.

- Have them record their responses on the chart, using the sound–spelling correspondences they know so far.

- When all the groups are finished, have each group present their web, explaining the topic and the information they added.

- Have students add any new details suggested by other groups.

Rock Sort

Materials: Paper folded into four sections, drawing tools, bins with labels for sorting rocks, four different kinds of small/medium-sized rocks for each student

Note: This activity can also be completed in partners or small groups.

- Give each student or group four small/medium-sized rocks of different types.
- Have students use their senses of touch and sight to describe their rocks to partners. Prompt students to use descriptive vocabulary, if applicable, as they describe their rocks: *smooth*, *rough*, *shiny*, *dull*, *striped*, _____*-colored*, etc.
- Next, have students fold a piece of paper in half once and then in half again, creating four squares/rectangles.
- Have students draw each rock (including identifying characteristics) and write a sentence describing the rock using the sound–spelling correspondences taught so far.
- After students have finished drawing and coloring their rocks, tell students that they are going to sort their rocks as a class.
- Place different-colored bins around the classroom and label them with the most common words used to describe students' rocks, such as *smooth*, *rough*, *shiny*, *dull*, *striped*, _____*-colored*, etc.
- Tell students that you are going to name a characteristic of rocks, or a way to describe them. If students have a rock that matches the named characteristic, they should raise it into the air. Confirm that all raised rocks match the named characteristic. Students should then place their rocks into the appropriate bin for that named characteristic.
- Repeat this process until all rocks have been sorted into the correct bin.
- Have students share with their neighbors and with the class how they described each rock and determined in which bin to place each rock. Students can also discuss the similarities and differences they observed among rocks.
- After the rocks have been sorted, students can then compare the rocks within each bin to determine which rock has the most or least of the characteristics within the sorted group.

Grade 1 | Unit 5

Unit Assessment

This Unit Assessment evaluates each student's retention of unit and academic vocabulary words and the core content targeted in *This Planet Rocks*. The results should guide review and remediation the following day.

There are three parts to this assessment. You may choose to do the parts in more than one sitting if you feel this is more appropriate for your students. Part I (Vocabulary Assessment) is divided into two sections: the first assesses unit-related vocabulary and the second assesses academic vocabulary. Parts II and III of the assessment address the core content targeted in *This Planet Rocks*.

PART I TEKS 1.6.G

Activity Page UA.1

Directions: I am going to ask a question using a word you have heard in the Read-Alouds and the unit. First I will say the word and then ask a question about it. If the answer to the question is "*yes*," circle the thumbs-up. If the answer to the question is "*no*," circle thumbs-down. I will ask each question two times. Let's do number one together.

1. **Extinct:** If dinosaurs are extinct, does that mean there are no more dinosaurs left on the earth? *(thumbs-up)*
2. **Mantle:** Is the mantle the outermost layer of the earth where we live? *(thumbs-down)*
3. **Inner Core:** Is the inner core a solid metal ball in the center of the earth? *(thumbs-up)*
4. **Sediments:** Do layers of sediments, or pieces of dirt and rock, pressed on top of one another over time form sedimentary rocks? *(thumbs-up)*
5. **Destructive:** Can some volcanoes be destructive when their lava and ash pour out onto the land around them? *(thumbs-up)*
6. **Crust:** Is the crust a layer of liquid rock deep inside the earth? *(thumbs-down)*
7. **Geologist:** Is a geologist a scientist who studies clouds and the sky? *(thumbs-down)*
8. **Fossils:** Are fossils the preserved imprint or bodies of animals and plants that died many years ago? *(thumbs-up)*

9. **Solid:** Is something solid when it takes the shape of whatever container it is in? *(thumbs-down)*

10. **Pressure:** Does pressure happen when the weight or force of something presses or pushes against something else? *(thumbs-up)*

Directions: I am going to ask more questions using other words you have heard and practiced. First I will say the word and then ask a question about it. If the answer to the question is "*yes*," circle the thumbs-up. If the answer to the question is "*no*," circle thumbs-down. I will ask each question two times.

11. **Varies:** When something varies, does it always stay the same? *(thumbs-down)*

12. **Characteristics:** Do the characteristics of rocks include their colors, textures, shapes, and sizes? *(thumbs-up)*

13. **Surface:** Is the surface of the earth all of the liquid rock that is deep inside? *(thumbs-down)*

14. **Layer:** When it is cold outside, do we wear more than one layer of clothing to keep warm? *(thumbs-up)*

15. **Preserved:** When you want to save something for the future, do you keep it preserved in a safe place? *(thumbs-up)*

PART II TEKS 1.6.G

Directions: I am going to ask you some questions. If the answer to the question is "*yes*," circle the thumbs-up. If the answer to the question is "*no*," circle the thumbs-down. I will ask each question two times.

Activity Page UA.2

1. Is the earth's surface covered by continents and oceans? *(thumbs-up)*
2. Is the equator an imaginary line that runs from the North Pole to the South Pole? *(thumbs-down)*
3. Is the earth shaped like a sphere or a ball? *(thumbs-up)*
4. Do we know about the earth because of the work of many scientists who study rocks and fossils? *(thumbs-up)*
5. Do heat, pressure, and time cause many changes inside the earth? *(thumbs-up)*
6. Does the earth have two layers: the crust and the core? *(thumbs-down)*
7. Do we live in the core of the earth? *(thumbs-down)*

8. Is a volcano caused by an eruption of magma making its way to the surface of the earth? *(thumbs-up)*
9. Is a geyser an eruption of lava? *(thumbs-down)*
10. Is salt an important mineral that is used by people? *(thumbs-up)*
11. Can all rocks be put into three groups: igneous, sedimentary, and metamorphic? *(thumbs-up)*
12. Do we know that dinosaurs lived on the earth because of fossilized bones that have been found? *(thumbs-up)*
13. Are fossils pieces of rock that come from the eruption of a geyser? *(thumbs-down)*

PART III

TEKS 1.6.G; TEKS 1.7.E

Activity Page UA.3

Directions: Place a star on the North Pole and a circle on the South Pole. Color the equator red. On the back of the paper, draw a picture of and write a sentence about the most interesting thing you learned about the earth.

Culminating Activities

NOTE TO TEACHER

Please use these final two days to address class results of the Unit Assessment. Based on the results of the Unit Assessment, you may wish to use this class time to provide remediation opportunities that target specific areas of weakness for individual students, small groups, or the whole class.

Alternatively, you may also choose to use this class time to extend or enrich students' experiences with unit knowledge. A number of enrichment activities are provided below in order to provide students with opportunities to enliven their experiences with unit concepts.

REMEDIATION

You may choose to regroup students according to particular area of weakness, as indicated from Unit Assessment results.

Remediation opportunities include:

- targeting Review activities
- revisiting lesson Applications
- rereading and discussing select Read-Alouds
- using the corresponding activities in the Language Studio

ENRICHMENT

Image Review

- Show the Flip Book images from any Read-Aloud again and have students retell the Read-Aloud using the images.

Image Card Review

Materials: Image Cards 10–14

- Divide the class into six groups. Give each group one of the Image Cards.
- Give the groups a few minutes to brainstorm everything they remember about the Image Card.
- Then come together as a class and give each group a chance to share.

Image Cards 10–14

Unit-Related Trade Book or Student Choice

Materials: Trade book

- Read an additional trade book to review fossils or dinosaurs.
- You may also choose to have students select a Read-Aloud to be heard again.

Fossil Museum

Materials: Homemade fossils (see following recipe), writing tools, index cards

Note: The following dough recipe will produce approximately eight fossils the size of a saucer. The fossils need time to dry so have students help you make the fossils one day, allowing them to dry overnight for use in the activity the following day.

Note: Be sure to check your school's policy regarding food distribution and allergies.

PART I

- Make the fossils with students using the following recipe.
- Allow the fossils to dry overnight

Model Fossil Recipe:

- Make dough by combining 1 cup wet, used coffee grounds, ½ cup cold coffee, ½ cup salt, and 1 ⅓ cups flour in a medium-sized bowl.
- Have students mix these ingredients together until mix resembles modeling dough. Add more flour if dough is sticky.
- Have students place a leaf, toy insect, and shell on the wax paper. The object can be face up or face down. The wax paper represents the ground.
- Have students flatten out a "layer of sediment" by flattening the ball of dough and laying it on top of the "organism." This represents the organisms being buried by sediment.
- Students can repeat this step a few times to represent time passing. Then students can remove the "organism" to represent the decay and see the impression left.
- Allow the fossils to dry overnight on a wire rack.

PART II

- Gather all the fossils together and count the total number of fossils.
- Divide students into groups based on the number of fossils. Each group should have at least one fossil.
- Discuss the characteristics of fossils with students. *(Most fossils form after a plant or animal is buried under layers of sediment. Pressure on the sediment preserves the body or imprint of the plant or animal, leaving a fossil.)*
- Explain to students that they are going to examine and label the fossils and then make a fossil display.
- Give each group writing tools and index cards. Ask the group to look closely at their fossil and to determine if it is a plant or an animal fossil.
- Have each group write a label for each of their fossils, using the sound–spelling correspondences taught thus far.
- Ask students how the fossil display should be organized (e.g., plant fossils and animal fossils). Make index card labels for the categories, and place them on a tabletop or clear surface.
- Invite students to display their fossils and the corresponding labels in the "museum."
- Spend a few minutes observing the fossils as a class. Ask students questions to provoke their thinking and help them relate this activity to the Read-Aloud material. Suggested questions include the following:
  - Which category has the most fossils?
  - If these fossils were real, what would they tell us about animals and plants that are no longer living?
  - Compare and contrast the fossils. How are they similar? How are they different?

Syntactic Awareness Video: Conjunction Junction

- Show students the Schoolhouse Rock! "Conjunction Junction" video, widely available on a number of teaching websites.

Rock and Mineral Collections

- If your school has a rock or mineral collection, you may want to share it with your class.
- If feasible, you may invite students to bring in interesting rocks to share with the class.

Class Book: This Planet Rocks

Materials: Paper, drawing tools

- Tell the class or a group of students that they are going to make a class book to help them remember what they have learned in this unit.
- Have students brainstorm important information about fossils, dinosaurs, and paleontologists.
- Have each student choose one idea, draw a picture of it, and then write a caption for it.
- Bind the pages to make a book to put in the class library for students to read again and again.

Heat, Pressure, and Time

Image Cards 1–3

Materials: Image Cards 1–3

- Give three students the Image Cards for heat, pressure, and time. Review what the Image Cards represent.
- Have the three students stand in various locations around the room.
- Tell the class that you are going to say a word. They will decide how heat, pressure, or time are connected to the word, and then walk to and stand with the person holding that Image Card. After the students have walked to the various locations, have them explain how the two words are connected. For example, if you say the word fossil, one student may walk to the Image Card of "pressure" and say, "It takes pressure to form a fossil." A second student may walk to the Image Card of "time" and say, "It takes a very long time for a fossil to form."
- Another variation is to use the signals explained in the Pausing Point.

Letter to a Geologist or Paleontologist

Materials: Writing paper, writing tools

- As a class, brainstorm ideas and then write a letter to Gerry, a real geologist, Pam, or a real paleontologist. Students may talk about the cool things that geologists or paleontologists do or ask questions that they still have about the earth.
- You may also ask students to write individual letters if they are ready to do this activity on their own.

Volcano Camera

Materials: Website: http://hvo.wr.usgs.gov/cams/

- Visit the Hawaiian Volcano Observatory's volcano cameras to obtain firsthand views of the Mauna Loa or Kilauea volcanoes of Hawaii.

Lava in a Cup

Materials (per student or small group): Clear plastic drinking cup, ¼ cup vegetable oil, 1 teaspoon of salt, water, food coloring (optional)

Note: Be sure to check your school's policy regarding food distribution and allergies

- Ask students to explain the difference between lava and magma. If necessary, remind them that magma is hot, molten rock under the surface of the earth, and lava is magma that has erupted from a volcano and has come out onto the surface of the earth.
- Explain to students that they are going to make a model of lava.
- Give each student, partner pair or group a cup.
- Fill the cups ¾ full with water.
- Add 5 drops of food coloring [optional].
- Add ¼ cup vegetable oil to each cup.
- Sprinkle 1 teaspoon salt on top of the water.
- Watch the lava move up and down in the cup.
- Add additional salt to keep the lava moving.
- Have students describe what they observe.

Forming Three Types of Rocks

Materials: Chips in different colors (chocolate or peanut butter; alternately, you can use crayon shavings instead), stove or hot plate (optional), aluminum foil, pan of hot water, plastic bags, clear jar

Note: This activity requires adult supervision, and you may desire the assistance of parents or a teacher's aide. Also, this activity can be completed with crayon shavings instead of chocolate chips. In addition, be sure to follow your school's policy regarding food distribution and allergies. Please follow your district's science safety protocols to exercise caution when completing the activity with your class.

- Review with students the three types of rocks and how each is formed.
- Tell students that you are going to use different-colored chips (white chocolate chips, semi-sweet chocolate chips, peanut butter chips, etc.) to model how each type of rock is formed, using heat, pressure, and time.
- To create igneous rocks, melt one color of the chips, either via stove/hot plate or by placing the chips on aluminum foil in a pan of very hot water. Allow the melted chips to cool. Note: For safety purposes, the teacher (or other adult) should be the only one who actually melts the chips. The teacher (or other adult) should be the only one with control of and access to the hot plate/stove as students observe this portion of the activity.
- Tell students that igneous rocks are formed from magma (melted rock) that has been heated and then cooled, similar to how these chocolate chips have been melted and then cooled.
- To create sedimentary rocks, place each color of chocolate chips into separate plastic bags. Students can crush these chips using their feet or hands.
- Next, layer each color of crushed chips into a clear jar. Have students help you press down on these layers using their hands or feet to simulate the formation of sedimentary rocks.
- Remind students that metamorphic rocks are rocks that undergo extreme amounts of heat and pressure.
- To create metamorphic rocks, first layer each color of crushed chocolate chips onto a piece of aluminum foil.
- Next, have students apply pressure to the layers using hands or feet. Place the pressed layers on aluminum foil in a pan of very hot water to melt the layers. Allow the melted layers to cool.
- Tell students that metamorphic rocks have undergone intense heat and pressure, similar to how these chips have been layered, pressed together, melted, and then cooled.
- Lead students in a discussion of how each type of "rock" was formed, using heat, pressure, and/or time.

Teacher Resources

Grade 1	Unit 5

Teacher Guide

Grade 1 | Unit 5

Teacher Resources

In this section you will find:

- Activity Book Answer Key
- Texas Essential Knowledge and Skills Correlation Chart
- English Language Proficiency Standards Correlation Chart

ACTIVITY BOOK ANSWER KEY

NAME: _____

DATE: _____

3.1 Activity Page

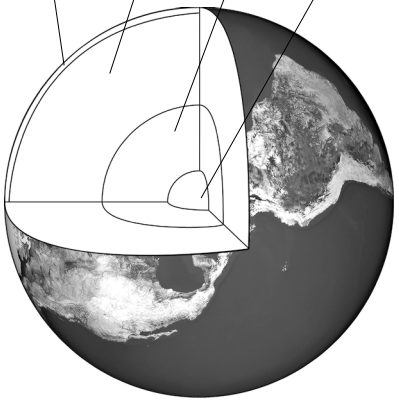
Directions: Color the crust brown, the mantle red, the outer core orange, and the inner core yellow. Cut out the labels for each part of the earth, then tape or glue the appropriate label to the matching color. Then, flip the page and write two sentences about two of the earth's layers on the back.

brown crust

red mantle

orange outer core

yellow inner core



inner core

outer core

mantle

crust

NAME: _____

DATE: _____

4.1 Activity Page

Directions: Think about how volcanoes and geysers are similar and how they are different. Draw or write how they are alike in the overlapping part of the two circles. Draw or write how volcanoes are different from geysers in the circle under the volcano. Draw or write how geysers are different from volcanoes in the circle under the geyser.

• steam and hot water erupts
• not as destructive
• some can be reliable
• magma never erupted out onto earth's surface

hot spot
• have eruptions
• caused by heat and pressure

• lava erupts
• shoot out ash and gas with lava
• create mountains
• formed Hawaii

NAME: _____

DATE: _____

PP.1 Assessment

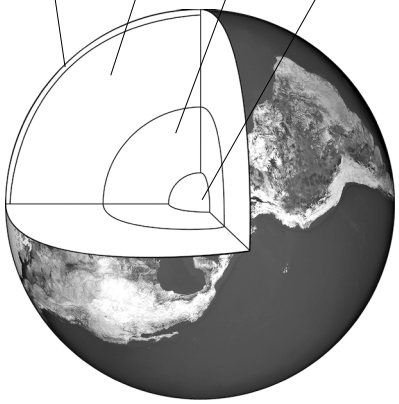
Directions: Color the crust brown, the mantle red, the outer core orange, and the inner core yellow. Cut out the labels for each part of the earth, and then tape or glue the appropriate label to the matching color.

brown crust

red mantle

orange outer core

yellow inner core



inner core

outer core

mantle

crust

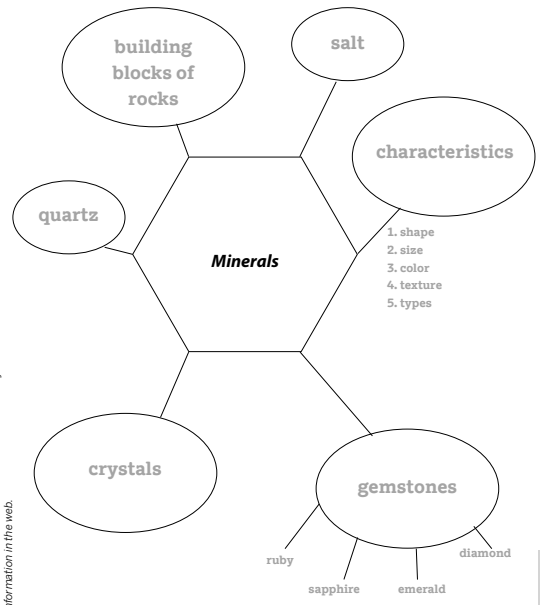
NAME: _____

DATE: _____

5.1 Activity Page

Directions: Create an idea web with information you learned about minerals. Write two or three sentences on the back about the information in the web.

Sample Completed Minerals Idea Web



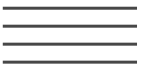
NAME: _____

DATE: _____

6.1 **Activity Page**

Directions: In the first column, draw pictures of and/or write about igneous rocks. In the second column, draw and/or write about sedimentary rocks. In the last column, draw and/or write about metamorphic rocks. Write at least two sentences about rocks on the back.

- most common
- type
- form when magma
- or lava cools and
- hardens
- mountains
- boulders
- Half Dome
- volcanic glass



- form when
- pressure over time
- hardens layers of
- sediments
- heat doesn't play
- a role in forming
- them
- coal
- ore
- Bryce Canyon
- Antelope Canyon
- sandstone

- least common
- type
- form when other
- types of rock
- undergo intense
- heat and pressure
- over time and thus
- change into new
- rock
- marble

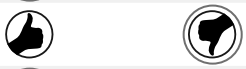
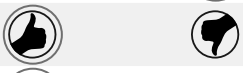
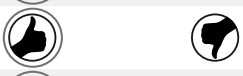
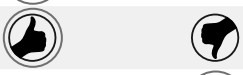
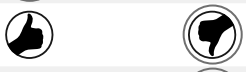
Unit 5

NAME: _____

DATE: _____

UA.1 **Assessment**

Directions: Listen to your teacher's instructions.

1. 
2. 
3. 
4. 
5. 
6. 
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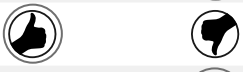
8. 
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Unit 5

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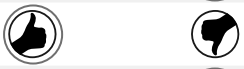
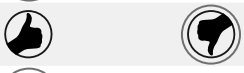
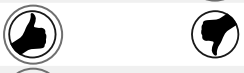
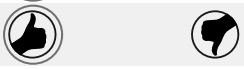
12. 
13. 
14. 
15. 

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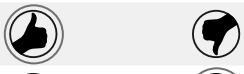
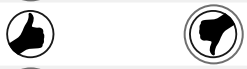
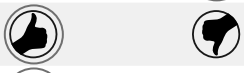
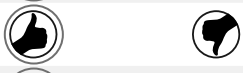
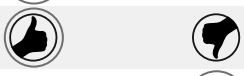
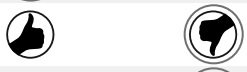
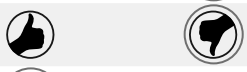
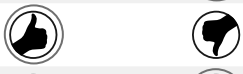
UA.2 **Assessment**

Directions: Listen to your teacher's instructions.

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
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Unit 5

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NAME: _____

DATE: _____

UA.3 **Assessment**

Directions: Label the North Pole with a star and the South Pole with a circle. Label the equator by coloring it red. On the back of the paper, draw a picture of and write a sentence about the most interesting thing you learned about This Planet Rocks.

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS—GRADE 1

Unit 5		Correlation—Teacher's Guide
(1) Developing and sustaining foundational language skills: listening, speaking, discussion, and thinking—oral language. The student develops oral language through listening, speaking, and discussion. The student is expected to:		
TEKS 1.1.A	listen actively, ask relevant questions to clarify information, and answer questions using multi-word responses	p. 51, p. 55, p. 72, p. 76, p. 86, p. 89
TEKS 1.1.B	follow, restate, and give oral instructions that involve a short, related sequence of actions	
TEKS 1.1.C	share information and ideas about the topic under discussion, speaking clearly at an appropriate pace and using the conventions of language	p. 5, p. 6, p. 10, p. 22, p. 26, p. 38, p. 42, p. 51, p. 64, p. 72, p. 83, p. 86, p. 89, p. 102, p. 106, p. 118, p. 121
TEKS 1.1.D	work collaboratively with others by following agreed-upon rules for discussion, including listening to others, speaking when recognized, and making appropriate contributions	p. 5, p. 102, p. 106
TEKS 1.1.E	develop social communication such as introducing himself/herself and others, relating experiences to a classmate, and expressing needs and feelings	p. 22, p. 35
(2) Developing and sustaining foundational language skills: listening, speaking, reading, writing, and thinking—beginning reading and writing. The student develops word structure knowledge through phonological awareness, print concepts, phonics, and morphology to communicate, decode, and spell. The student is expected to:		
(A) demonstrate phonological awareness by:		
TEKS 1.2.A.i	producing a series of rhyming words	
TEKS 1.2.A.ii	recognizing spoken alliteration or groups of words that begin with the same spoken onset or initial sound	p. 6, p. 13
TEKS 1.2.A.iii	distinguishing between long and short vowel sounds in one-syllable words	
TEKS 1.2.A.iv	recognizing the change in spoken word when a specified phoneme is added, changed, or removed	
TEKS 1.2.A.v	blending spoken phonemes to form one-syllable words, including initial and/or final consonant blends	
TEKS 1.2.A.vi	manipulating phonemes within base words	
TEKS 1.2.A.vii	segmenting spoken one-syllable words of three to five phonemes into individual phonemes, including words with initial and/or final consonant blends	
(B) demonstrate and apply phonetic knowledge by:		
TEKS 1.2.B.i	decoding words in isolation and in context by applying common letter-sound correspondences	
TEKS 1.2.B.ii	decoding words with initial and final consonant blends, digraphs, and trigraphs	

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS—GRADE 1

Unit 5		Correlation—Teacher's Guide
TEKS 1.2.B.iii	decoding words with closed syllables; open syllables; VCe syllables; vowel teams, including vowel digraphs and diphthongs; and r-controlled syllables	
TEKS 1.2.B.iv	using knowledge of base words to decode common compound words and contractions	
TEKS 1.2.B.v	decoding words with inflectional endings including *-ed*, *-s*, and *-es*	
TEKS 1.2.B.vi	identifying and reading at least 100 high-frequency words from a research-based list	
(C) demonstrate and apply spelling knowledge by:		
TEKS 1.2.C.i	spelling words with closed syllables, open syllables, VCe syllables, vowel teams, and r-controlled syllables	
TEKS 1.2.C.ii	spelling words with initial consonant digraphs	
TEKS 1.2.C.iii	spelling words using sound-spelling patterns	
TEKS 1.2.C.iv	spelling high-frequency words from a research-based list	
TEKS 1.2.D	demonstrate print awareness by identifying the information that different parts of a book provide	
TEKS 1.2.E	alphabetize a series of words to the first or second letter and use a dictionary to find words	
TEKS 1.2.F	develop handwriting by printing words, sentences, and answers legibly leaving appropriate spaces between words	
(3) Developing and sustaining foundational language skills: listening, speaking, reading, writing, and thinking—vocabulary. The student uses newly acquired vocabulary expressively. The student is expected to:		
TEKS 1.3.A	use a resource such as a picture dictionary or digital resource to find words	
TEKS 1.3.B	use illustrations and texts the student is able to read or hear to learn or clarify word meanings	p. 6, p. 13, p. 20, p. 22, p. 28, p. 38, p. 44, p. 49, p. 51, p. 57, p. 72, p. 78, p. 86, p. 91, p. 100, p. 102, p. 108, p. 118, p. 123, p. 130
TEKS 1.3.C	identify the meaning of words with the affixes -s, -ed, and -ing	
TEKS 1.3.D	identify and use words that name actions, directions, positions, sequences, categories, and locations	p. 22, p. 26, p. 35, p. 38, p. 42, p. 44
(4) Developing and sustaining foundational language skills: listening, speaking, reading, writing, and thinking—fluency. The student reads grade-level text with fluency and comprehension. The student is expected to use appropriate fluency (rate, accuracy, and prosody) when reading grade-level text.		
TEKS 1.4	use appropriate fluency (rate, accuracy, and prosody) when reading grade-level text	

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS—GRADE 1

Unit 5		Correlation—Teacher's Guide
(5) Developing and sustaining foundational language skills: listening, speaking, reading, writing, and thinking—self-sustained reading. The student reads grade-appropriate texts independently. The student is expected to self-select text and interact independently with text for increasing periods of time.		
TEKS 1.5	self-select text and interact independently with text for increasing periods of time	
(6) Comprehension skills: listening, speaking, reading, writing, and thinking using multiple texts. The student uses metacognitive skills to both develop and deepen comprehension of increasingly complex texts. The student is expected to:		
TEKS 1.6.A	establish purpose for reading assigned and self-selected texts with adult assistance	
TEKS 1.6.B	generate questions about text before, during, and after reading to deepen understanding and gain information with adult assistance	
TEKS 1.6.C	make and correct or confirm predictions using text features, characteristics of genre, and structures with adult assistance	
TEKS 1.6.D	create mental images to deepen understanding with adult assistance	p. 86, p. 91
TEKS 1.6.E	make connections to personal experiences, ideas in other texts, and society with adult assistance	p. 6, p. 10, p. 22, p. 28, p. 72, p. 76, p. 78, p. 118, p. 123
TEKS 1.6.F	make inferences and use evidence to support understanding with adult assistance	
TEKS 1.6.G	evaluate details to determine what is most important with adult assistance	p. 6, p. 13, p. 22, p. 28, p. 38, p. 44, p. 51, p. 57, p. 72, p. 78, p. 86, p. 91, p. 118, p. 123, p. 138, p. 139, p. 140
TEKS 1.6.H	synthesize information to create new understanding with adult assistance	p. 51, p. 64, p. 72, p. 84
TEKS 1.6.I	monitor comprehension and make adjustments such as re-reading, using background knowledge, checking for visual cues, and asking questions when understanding breaks down	
(7) Response skills: listening, speaking, reading, writing, and thinking using multiple texts. The student responds to an increasingly challenging variety of sources that are read, heard, or viewed. The student is expected to:		
TEKS 1.7.A	describe personal connections to a variety of sources	
TEKS 1.7.B	Write brief comments on literary or informational texts	p. 6, p. 20, p. 38, p. 49, p. 72, p. 84, p. 86, p. 100
TEKS 1.7.C	use text evidence to support an appropriate response	p. 102, p. 108
TEKS 1.7.D	retell texts in ways that maintain meaning	
TEKS 1.7.E	interact with sources in meaningful ways such as illustrating or writing	p. 6, p. 20, p. 140
TEKS 1.7.F	respond using newly acquired vocabulary as appropriate	
(8) Multiple genres: listening, speaking, reading, writing, and thinking using multiple texts—literary elements. The student recognizes and analyzes literary elements within and across increasingly complex traditional, contemporary, classical, and diverse literary texts. The student is expected to:		
TEKS 1.8.A	discuss topics and determine theme using text evidence with adult assistance	
TEKS 1.8.B	describe the main character(s) and the reason(s) for their actions	

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS—GRADE 1

Unit 5		Correlation—Teacher's Guide
TEKS 1.8.C	describe plot elements including the main events, the problem, and the resolution, for texts read aloud and independently	
TEKS 1.8.D	describe the setting	
(9) Multiple genres: listening, speaking, reading, writing, and thinking using multiple texts—genres. The student recognizes and analyzes genre-specific characteristics, structures, and purposes within and across increasingly complex traditional, contemporary, classical, and diverse texts. The student is expected to:		
TEKS 1.9.A	demonstrate knowledge of distinguishing characteristics of well-known children's literature such as folktales, fables, fairy tales, and nursery rhymes	
TEKS 1.9.B	discuss rhyme, rhythm, repetition, and alliteration in a variety of poems	
TEKS 1.9.C	discuss elements of drama such as characters and setting	
(D) recognize characteristics and structures of informational text, including:		
TEKS 1.9.D.i	the central idea and supporting evidence with adult assistance	
TEKS 1.9.D.ii	features and simple graphics to locate or gain information	
TEKS 1.9.D.iii	organizational patterns such as chronological order and description with adult assistance	
TEKS 1.9.E	recognize characteristics of persuasive text with adult assistance and state what the author is trying to persuade the reader to think or do	
TEKS 1.9.F	recognize characteristics of multimodal and digital texts	
(10) Author's purpose and craft: listening, speaking, reading, writing, and thinking using multiple texts. The student uses critical inquiry to analyze the authors' choices and how they influence and communicate meaning within a variety of texts. The student analyzes and applies author's craft purposefully in order to develop his or her own products and performances. The student is expected to:		
TEKS 1.10.A	discuss the author's purpose for writing text	
TEKS 1.10.B	discuss how the use of text structure contributes to the author's purpose	
TEKS 1.10.C	discuss with adult assistance the author's use of print and graphic features to achieve specific purposes	
TEKS 1.10.D	discuss how the author uses words that help the reader visualize	
TEKS 1.10.E	listen to and experience first- and third-person texts	
(11) Composition: listening, speaking, reading, writing, and thinking using multiple texts—writing process. The student uses the writing process recursively to compose multiple texts that are legible and uses appropriate conventions. The student is expected to:		
TEKS 1.11.A	plan a first draft by generating ideas for writing such as by drawing and brainstorming	
(B) develop drafts in oral, pictorial, or written form by:		
TEKS 1.11.B.i	organizing with structure	
TEKS 1.11.B.ii	developing an idea with specific and relevant details	
TEKS 1.11.C	Revise drafts by adding details in pictures or words.	

TEXAS ESSENTIAL KNOWLEDGE AND SKILLS—GRADE 1

Unit 5		Correlation—Teacher's Guide
(D) edit drafts using standard English conventions, including:		
TEKS 1.11.D	edit drafts using standard English conventions	
TEKS 1.11.D.i	complete sentences with subject-verb agreement	
TEKS 1.11.D.ii	past and present verb tense	
TEKS 1.11.D.iii	singular, plural, common, and proper nouns	
TEKS 1.11.D.iv	adjectives, including articles	
TEKS 1.11.D.v	adverbs that convey time	
TEKS 1.11.D.vi	prepositions	p. 22, p. 25, p. 26
TEKS 1.11.D.vii	pronouns, including subjective, objective, and possessive cases	
TEKS 1.11.D.viii	capitalization for the beginning of sentences and the pronoun "I"	
TEKS 1.11.D.ix	punctuation marks at the end of declarative, exclamatory, and interrogative sentences	
TEKS 1.11.D.x	correct spelling of words with grade-appropriate orthographic patterns and rules and high-frequency words with adult assistance	
TEKS 1.11.E	publish and share writing	p. 102, p. 103, p. 115, p. 116, p. 118, p. 119, p. 130
(12) Composition: listening, speaking, reading, writing, and thinking using multiple texts—genres. The student uses genre characteristics and craft to compose multiple texts that are meaningful. The student is expected to:		
TEKS 1.12.A	dictate or compose literary texts, including personal narratives and poetry	
TEKS 1.12.B	dictate or compose informational texts, including procedural texts	
TEKS 1.12.C	dictate or compose correspondence such as thank you notes or letters	p. 21, p. 22, p. 35, p. 102, p. 115, p. 118, p. 130, p. 136, p. 137, p. 143
(13) Inquiry and research: listening, speaking, reading, writing, and thinking using multiple texts. The student engages in both short-term and sustained recursive inquiry processes for a variety of purposes. The student is expected to:		
TEKS 1.13.A	generate questions for formal and informal inquiry with adult assistance	
TEKS 1.13.B	develop and follow a research plan with adult assistance	
TEKS 1.13.C	identify and gather relevant sources and information to answer the questions with adult assistance	
TEKS 1.13.D	demonstrate understanding of information gathered with adult assistance	
TEKS 1.13.E	use an appropriate mode of delivery, whether written, oral, or multimodal, to present results	

ENGLISH LANGUAGE PROFICIENCY STANDARDS—GRADE 1

Unit 5		Correlation—Teacher's Guide
(1) Cross-curricular second language acquisition/learning strategies. The ELL uses language learning strategies to develop an awareness of his or her own learning processes in all content areas. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student's level of English language proficiency. The student is expected to:		
ELPS 1.A	use prior knowledge and experiences to understand meanings in English	p. 76
ELPS 1.B	monitor oral and written language production and employ self-corrective techniques or other resources	
ELPS 1.C	use strategic learning techniques such as concept mapping, drawing, memorizing, comparing, contrasting, and reviewing to acquire basic and grade-level vocabulary	
ELPS 1.D	speak using learning strategies such as requesting assistance, employing nonverbal cues, and using synonyms and circumlocution (conveying ideas by defining or describing when exact English words are not known)	
ELPS 1.E	internalize new basic and academic language by using and reusing it in meaningful ways in speaking and writing activities that build concept and language attainment	
ELPS 1.F	use accessible language and learn new and essential language in the process	p. 43, p. 55, p. 130
ELPS 1.G	demonstrate an increasing ability to distinguish between formal and informal English and an increasing knowledge of when to use each one commensurate with grade-level learning expectations	p. 65
ELPS 1.H	develop and expand repertoire of learning strategies such as reasoning inductively or deductively, looking for patterns in language, and analyzing sayings and expressions commensurate with grade-level learning expectations	
(2) Cross-curricular second language acquisition/listening. The ELL listens to a variety of speakers including teachers, peers, and electronic media to gain an increasing level of comprehension of newly acquired language in all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in listening. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student's level of English language proficiency. The student is expected to:		

ENGLISH LANGUAGE PROFICIENCY STANDARDS—GRADE 1

Unit 5		Correlation—Teacher's Guide
ELPS 2.A	distinguish sounds and intonation patterns of English with increasing ease	
ELPS 2.B	recognize elements of the English sound system in newly acquired vocabulary such as long and short vowels, silent letters, and consonant clusters	
ELPS 2.C	learn new language structures, expressions, and basic and academic vocabulary heard during classroom instruction and interactions	
ELPS 2.D	monitor understanding of spoken language during classroom instruction and interactions and seek clarification as needed	
ELPS 2.E	use visual, contextual, and linguistic support to enhance and confirm understanding of increasingly complex and elaborated spoken language	
ELPS 2.F	listen to and derive meaning from a variety of media such as audio tape, video, DVD, and CD-ROM to build and reinforce concept and language attainment	
ELPS 2.G	understand the general meaning, main points, and important details of spoken language ranging from situations in which topics, language, and contexts are familiar to unfamiliar	p. 10, p. 18, p. 34, p. 36, p. 43, p. 106, p. 113
ELPS 2.H	understand implicit ideas and information in increasingly complex spoken language commensurate with grade-level learning expectations	
ELPS 2.I	demonstrate listening comprehension of increasingly complex spoken English by following directions, retelling or summarizing spoken messages, responding to questions and requests, collaborating with peers, and taking notes commensurate with content and grade-level needs	p. 10
(3) Cross-curricular second language acquisition/speaking. The ELL speaks in a variety of modes for a variety of purposes with an awareness of different language registers (formal/informal) using vocabulary with increasing fluency and accuracy in language arts and all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in speaking. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student's level of English language proficiency. The student is expected to:		
ELPS 3.A	practice producing sounds of newly acquired vocabulary such as long and short vowels, silent letters, and consonant clusters to pronounce English words in a manner that is increasingly comprehensible	

ENGLISH LANGUAGE PROFICIENCY STANDARDS—GRADE 1

Unit 5		Correlation—Teacher's Guide
ELPS 3.B	expand and internalize initial English vocabulary by learning and using high-frequency English words necessary for identifying and describing people, places, and objects, by retelling simple stories and basic information represented or supported by pictures, and by learning and using routine language needed for classroom communication	p. 27
ELPS 3.C	speak using a variety of grammatical structures, sentence lengths, sentence types, and connecting words with increasing accuracy and ease as more English is acquired	p. 18, p. 36
ELPS 3.D	speak using grade-level content area vocabulary in context to internalize new English words and build academic language proficiency	
ELPS 3.E	share information in cooperative learning interactions	p. 65, p. 85
ELPS 3.F	ask and give information ranging from using a very limited bank of high-frequency, high-need, concrete vocabulary, including key words and expressions needed for basic communication in academic and social contexts, to using abstract and content-based vocabulary during extended speaking assignments	
ELPS 3.G	express opinions, ideas, and feelings ranging from communicating single words and short phrases to participating in extended discussions on a variety of social and grade-appropriate academic topics	p. 34, p. 128
ELPS 3.H	narrate, describe, and explain with increasing specificity and detail as more English is acquired	p. 122
ELPS 3.I	adapt spoken language appropriately for formal and informal purposes	p. 65
ELPS 3.J	respond orally to information presented in a wide variety of print, electronic, audio, and visual media to build and reinforce concept and language attainment	p. 122
(4) Cross-curricular second language acquisition/reading. The ELL reads a variety of texts for a variety of purposes with an increasing level of comprehension in all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in reading. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student's level of English language proficiency. For kindergarten and grade 1, certain of these student expectations apply to text read aloud for students not yet at the stage of decoding written text. The student is expected to:		
ELPS 4.A	learn relationships between sounds and letters of the English language and decode (sound out) words using a combination of skills such as recognizing sound-letter relationships and identifying cognates, affixes, roots, and base words	
ELPS 4.B	recognize directionality of English reading such as left to right and top to bottom	

ENGLISH LANGUAGE PROFICIENCY STANDARDS—GRADE 1

Unit 5		Correlation—Teacher's Guide
ELPS 4.C	develop basic sight vocabulary, derive meaning of environmental print, and comprehend English vocabulary and language structures used routinely in written classroom materials	
ELPS 4.D	use prereading supports such as graphic organizers, illustrations, and pretaught topic-related vocabulary and other prereading activities to enhance comprehension of written text	
ELPS 4.E	read linguistically accommodated content area material with a decreasing need for linguistic accommodations as more English is learned	
ELPS 4.F	use visual and contextual support and support from peers and teachers to read grade-appropriate content area text, enhance and confirm understanding, and develop vocabulary, grasp of language structures, and background knowledge needed to comprehend increasingly challenging language	
ELPS 4.G	demonstrate comprehension of increasingly complex English by participating in shared reading, retelling or summarizing material, responding to questions, and taking notes commensurate with content area and grade level needs	p. 47, p. 62, p. 83, p. 89, p. 98, p. 113
ELPS 4.H	read silently with increasing ease and comprehension for longer periods	
ELPS 4.I	demonstrate English comprehension and expand reading skills by employing basic reading skills such as demonstrating understanding of supporting ideas and details in text and graphic sources, summarizing text, and distinguishing main ideas from details commensurate with content area needs	p. 47, p. 83, p. 89, p. 98
ELPS 4.J	demonstrate English comprehension and expand reading skills by employing inferential skills such as predicting, making connections between ideas, drawing inferences and conclusions from text and graphic sources, and finding supporting text evidence commensurate with content area needs	
ELPS 4.K	demonstrate English comprehension and expand reading skills by employing analytical skills such as evaluating written information and performing critical analyses commensurate with content area and grade-level needs	
(5) Cross-curricular second language acquisition/writing. The ELL writes in a variety of forms with increasing accuracy to effectively address a specific purpose and audience in all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in writing. In order for the ELL to meet grade-level learning expectations across foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student's level of English language proficiency. For kindergarten and grade 1, certain of these student expectations do not apply until the student has reached the stage of generating original written text using a standard writing system. The student is expected to:		
ELPS 5.A	learn relationships between sounds and letters of the English language to represent sounds when writing in English	

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Unit 5		Correlation—Teacher's Guide
ELPS 5.B	write using newly acquired basic vocabulary and content-based grade-level vocabulary	p. 101, p. 117
ELPS 5.C	spell familiar English words with increasing accuracy, and employ English spelling patterns and rules with increasing accuracy as more English is acquired	
ELPS 5.D	edit writing for standard grammar and usage, including subject-verb agreement, pronoun agreement, and appropriate verb tenses commensurate with grade-level expectations as more English is acquired	
ELPS 5.E	employ increasingly complex grammatical structures in content area writing commensurate with grade level expectations such as (i) using correct verbs, tenses, and pronouns/antecedents; (ii) using possessive case (apostrophe -s) correctly; and, (iii) using negatives and contractions correctly	
ELPS 5.F	write using a variety of grade-appropriate sentence lengths, patterns, and connecting words to combine phrases, clauses, and sentences in increasingly accurate ways as more English is acquired	p. 21, p. 50
ELPS 5.G	narrate, describe, and explain with increasing specificity and detail to fulfill content area writing needs as more English is acquired	

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K–5 Reading Language Arts

ENGLISH

THIS PLANET ROCKS

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