

LESSON OVERVIEW

Lesson 4 Understanding Scientific Texts

LSSELA Focus

Explain events . . . ideas, or concepts . . . in a scientific . . . text, including what happened and why, based on specific information in the text. **RI.4.3**

Lesson Objectives

Reading

- Describe the events, ideas, and concepts presented in a scientific text. **RI.4.3**
- Use details from the text to explain the cause-and-effect relationships in a scientific text. **RI.4.3**

Writing

- Draw evidence from informational texts to support analysis and reflection. **W.4.9b**

Speaking and Listening

- Pose and respond to specific questions and contribute to discussions. **SL.4.1c**

Language

- Use context to determine the meaning of unknown words and phrases. **L.4.4a**
- Consult reference materials to find the pronunciation and determine or clarify the precise meaning of key words and phrases. **L.4.4c**
- Use academic vocabulary. **L.4.6**

Additional Practice: RI.4.1, RI.4.2, RI.4.3, RI.4.4, RI.4.7, SL.4.1

Academic Talk

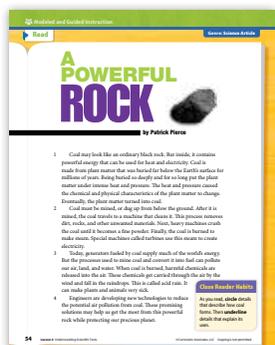
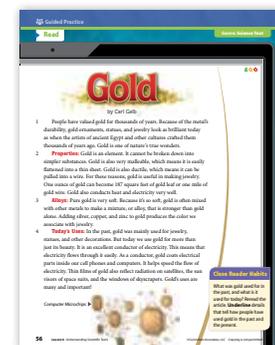
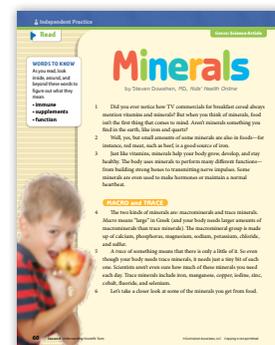
See **Glossary of Terms**, pp. TR2–TR9

- scientific text
- events
- causes
- effects

Learning Progression

Grade 3	Grade 4	Grade 5
Students describe cause-and-effect and sequential relationships between ideas in informational texts.	Building on Grade 3, students explain ideas, including causes and effects, in a scientific text. This standard emphasizes that students need to closely read scientific texts and draw on specific details to explain cause-and-effect relationships in a text.	Grade 5 increases in complexity by requiring students to explain relationships between two or more ideas, events, or people in informational texts.

Lesson Text Selections

Modeled and Guided Instruction	Guided Practice	Independent Practice
 <p>A Powerful Rock by Patrick Pierce Genre: Science Article</p>	 <p>Gold by Carl Gelb Genre: Science Text</p>	 <p>Minerals by Steven Dowshen, MD Genre: Science Article</p>

Lesson Pacing Guide

Whole Class Instruction *30–45 minutes per day*

Day 1

[Teacher-Toolbox.com](#) **Interactive Tutorial**

Understanding Technical and Scientific Texts—Level D
20 min (optional)

Introduction pp. 52–53

- **Read** Understanding Scientific Texts 10 min
- **Think** 10 min
Graphic Organizer: Two-Column Chart
- **Talk** 5 min
Quick Write (TRB) 5 min

Day 2

Modeled and Guided Instruction pp. 54–55, 58

- **Read** A Powerful Rock 10 min
- **Think** 10 min
Graphic Organizer: Two-Column Chart
- **Talk** 5 min
- **Write** Short Response 10 min

Day 3

Guided Practice pp. 56–57, 59

- **Read** Gold 10 min
- **Think** 10 min
- **Talk** 5 min
- **Write** Short Response 10 min

Day 4

Independent Practice pp. 60–65

- **Read** Minerals 15 min
- **Think** 10 min
- **Write** Short Response 10 min

Day 5

Independent Practice pp. 60–65

- **Review** Answer Analysis (TRB) 10 min
- **Review** Response Analysis (TRB) 10 min
- **Assign and Discuss** Learning Target 10 min

Language Handbook

Lesson 1 Relative Pronouns and Adverbs, pp. 464–465
20 min (optional)

Small Group Differentiation

[Teacher-Toolbox.com](#)

Reteach

Ready Reading Prerequisite Lessons

Grade 3

- Lesson 3 Reading About Time and Sequence
- Lesson 4 Describing Cause and Effect

Teacher-led Activities

Tools for Instruction

- Text Structure

Personalized Learning

[i-Ready.com](#)

Independent

i-Ready Close Reading Lessons

- **Grade 3** Describing Cause and Effect
- **Grade 4** Understanding Scientific Texts



Get Started

- Explain to students that in this lesson they will be reading about cause-and-effect relationships in scientific texts.
- Tap into what students already know about cause and effect. For example, bring up an example from nature, such as ice melting on a pond. Discuss why this happens.
- Guide students to understand that the ice melts *because* heat from the sun's rays increases the temperature of the ice. This turns the ice into water. Explain:

When something happens, there is usually a reason it happens. In this example, the ice melts because of heat from the sun. Without this heat, the ice would remain frozen. What happened is the *effect*—the ice melted. Why it happened is the *cause*—the sun's heat raised the ice's temperature.

- Focus students' attention on the Learning Target. Read it aloud to set the purpose for the lesson.
- Display the Academic Talk words and phrases. Tell students to listen for these words and phrases and their meanings as you work through the lesson together. Use the Academic Talk Routine on pp. A48–A49.

ELL English Language Learners

Genre Focus

Read

- Read aloud the Read section as students follow along. Restate to reinforce:

When you read scientific texts, it's a good idea to stop and ask yourself not only what happens but also how and why it happens. When you connect causes and effects of a natural process, you can better understand what you read.
- Direct students' attention to the numbered illustrations. Tell students to analyze the pictures to figure out what events happen and how and why they happen.

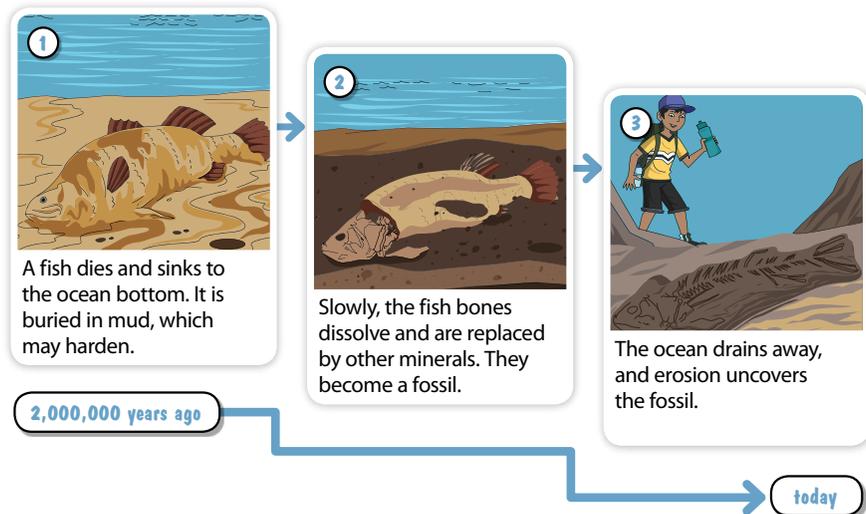
Lesson 4 Understanding Scientific Texts

Learning Target

Thinking carefully about information in science texts will help you understand what happens in the natural world and why or how it happens.

- ▶ **Read** A good **scientific text** is like having a science expert at your side explaining the **causes** and **effects** of everything that goes on around you. It tells *what* happens during a set of **events** in nature. It also answers important questions by explaining *how* the event happens and *why* it happens. These answers help you understand the world you live in.

Look at the cartoon below. Think about what events are happening. Also think about how and why they are happening.



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ELL English Language Learners Develop Language

Academic Vocabulary To talk about science texts, students need to be able to use common academic words and phrases such as those shown on page 53. Preview the words by asking:

- **What are some events that happen every year in nature?** (*It rains and snows: plants grow and die; baby animals are born.*)
- **What are major causes of pollution?** (*trash, burning fuels, dumping chemicals*)
- **What are some effects of rain?** (*things get wet, plants grow*)
- **Which academic word or phrase describes what is happening in the pictures on page 52?** (*natural process*)

Genre Focus Scientific Text

Scientific texts are informational texts that tell about topics related to science. Such texts describe how and why natural events occur and the results of those events.

A science text answers key questions such as *what*, *why*, and *how*. It usually has a conclusion that summarizes the text. Useful information is often represented visually with charts, diagrams, and graphs.

Provide some examples of science texts that describe natural events and processes, such as Seymour Simon's books *Weather*, *Volcanoes*, *Hurricanes*, and *Lightning*. Then ask students to name other science texts they've read.

- **Think** Consider everything you've learned so far about reading scientific texts. Use information in the cartoon and the *How and Why* column to add the events to the *What Happened* column of the chart. List the events in the order they occur in nature. These events answer the question: "What happened?"

What Happened	How and Why
Events That Created a Fossil <ul style="list-style-type: none"> • A dead fish is covered with mud at the bottom of the ocean. • The mud hardens around the fish skeleton. • The fish skeleton slowly dissolves. Minerals fill in and harden where the skeleton was. • Millions of years later, the rock wears away and a person discovers the fossil in the shape of the fish skeleton. 	How and Why a Fossil Is Created <p>Over millions of years, the fish skeleton dissolves and is replaced by other minerals. They harden in the shape of the skeleton. This creates a fossil. Later, erosion wears away the rock and soil to uncover the fossil.</p>

- **Talk** Share the events you added to the chart with a partner.
- Did you agree on the events and their order?
 - How did the details in the chart help you understand more about the causes and effects of the events being shown?



Academic Talk

Use these words and phrases to talk about the text.

- scientific text
- causes
- effects
- events

Think

- Have students read aloud the Think section. Explain that the chart will help them organize their thinking.
- Have partners complete the chart. Remind students to use the words and pictures in the cartoon to describe what events happened in creating the fossil.
- As students work, circulate and provide assistance as needed.
- Ask volunteers to share what they wrote in their charts.
- Make certain that students understand that what happened (the effect) is that the fish became a fossil. It happened because the fish was buried in mud and its remains changed over time to minerals (the cause).

Talk

- Read aloud the Talk prompt.
- Have partners discuss the events they listed in their charts. Encourage students to describe the natural process in a *because* statement. The fish became a fossil *because* . . .
- Ask volunteers to share their ideas.

Quick Write Have students write a response to the following prompt:

Think about a natural process you know about from your study of science. Ideas include how a plant grows, how rocks change, or how a simple machine works. Write a few sentences to describe the events that happen and explain why they happen.

Ask students to share their responses.

● Monitor Understanding

Wrap Up

- Invite students to share what they've learned so far. Encourage them to use the Academic Talk words and phrases in their explanations.
- Explain to students that when they read scientific texts, they learn about events in the natural world. They discover the connections, or relationships, between what happens and why.

In the next section, we'll read a scientific text and explore more cause-and-effect relationships. Thinking about causes and effects will help you better understand the natural process described.

● Monitor Understanding

If... students struggle to identify cause-and-effect relationships, **then...** demonstrate an example. Have a student clap his or her hands and ask:

- **What happened?** (*The student made a loud noise.*)
- **Why did it happen?** (*The student clapped his/her hands together.*)

Ask students to provide their own cause-and-effect examples. Encourage them to think of examples that happen in the natural world.

Get Started

Today you will read a science article about a natural resource. First, you'll read to understand what the author says. Then you'll read to understand details about causes and effects.

Read

- Read aloud the title of the article and call attention to the photograph. Have students predict what the article is about.
- Have students read the article independently. Tell them to place a check mark above any confusing words and phrases as they read. Remind students to look inside, around, and beyond each unknown word or phrase to help them figure out its meaning.
- When students have finished reading, clarify the meanings of words and phrases they still find confusing. Then use the questions below to check understanding. Encourage students to identify details in the text that support their answers.

What do we use coal for? (*to produce heat and electricity*)

Where is coal found in nature? (*below the Earth's surface*)

What problems can mining and burning coal create? (*pollution of the air, land, and water*)

EL English Language Learners

Word Learning Strategy

Explore

- Read aloud the Explore question at the top of p. 55 to set the purpose for the second read. Tell students they will need to take a closer look at processes to answer this question.
- Have students read aloud the Close Reader Habit on p. 54.

TIP Tell students that words such as *after*, *next*, and *finally* reveal the order of events in a process. An event's cause may be found in the preceding step of the sequence, and its effect may appear in the next step.

A POWERFUL ROCK



by Patrick Pierce

- 1 Coal may look like an ordinary black rock. But inside, it contains powerful energy that can be used for heat and electricity. Coal is made from plant matter that was buried far below the Earth's surface for millions of years. Being buried so deeply and for so long put the plant matter under intense heat and pressure. The heat and pressure caused the chemical and physical characteristics of the plant matter to change. Eventually, the plant matter turned into coal.
- 2 Coal must be mined, or dug up from below the ground. After it is mined, the coal travels to a machine that cleans it. This process removes dirt, rocks, and other unwanted materials. Next, heavy machines crush the coal until it becomes a fine powder. Finally, the coal is burned to make steam. Special machines called turbines use this steam to create electricity.
- 3 Today, generators fueled by coal supply much of the world's energy. But the processes used to mine coal and convert it into fuel can pollute our air, land, and water. When coal is burned, harmful chemicals are released into the air. These chemicals get carried through the air by the wind and fall in the raindrops. This is called acid rain. It can make plants and animals very sick.
- 4 Engineers are developing new technologies to reduce the potential air pollution from coal. These promising solutions may help us get the most from this powerful rock while protecting our precious planet.

Close Reader Habits

As you read, **circle** details that describe how coal forms. Then **underline** details that explain its uses.

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EL English Language Learners

Build Meaning

Build Background Show students images or videos of coal being used to generate electricity. Have students describe what they see and ask questions about anything they may not understand.

- Preview words from the passage that appear in the images or videos you show. For example, images may have the labels *steam*, *turbines*, or *generators*. Ask students to describe or share what they know about any words you preview.

Word Learning Strategy

Use Context Clues

- Hold up a wooden pencil. Explain that you are going to name characteristics of the pencil. State its characteristics, such as that it is made from wood, it has a graphite point, and it has an eraser.
- Ask students what the characteristics tell about the pencil. (*how it looks, what it's made of*)
- Guide students to the word *characteristics* in paragraph 1. Given the context and what they know, what does *characteristics* mean? (*features or qualities of an object*)
- Ask students to suggest other words that could be used in place of *characteristics* in this sentence. (*properties, qualities, features*)

L.4.4a

Explore

What information in "A Powerful Rock" helps you understand how coal is formed and how it is used today?



Look for the parts of the text that answer *what, how, and why* questions.

Think

- 1 Complete the chart below by adding the descriptions of what happens. Then explain how or why it happens.

What Happens	How and Why It Happens
How Coal Is Formed	
Plant matter from millions of years ago is changed into coal.	The heat and pressure from being buried made the plant matter change. The chemical and physical characteristics changed, making coal.
How Coal Is Used	
Coal is mined and burned to make steam, which makes energy.	Coal is used to produce energy that creates electricity.
Using coal harms the environment.	The mining and burning of coal creates pollution.

Talk

- 2 Explain why the author describes coal as a "powerful rock." Describe **two** benefits and **two** problems created by people's use of coal.



Write

- 3 **Short Response** Explain how people process and use this "powerful rock." Include at least **one** benefit and **one** problem caused by people's use of coal. Include details to support your response. Use the space provided on page 58 to write your answer.

HINT Find details about benefits and problems, such as "supply energy" and "harmful chemicals."

Think Aloud

- From the first part of the chart, I know *what* happens first: Plant matter buried below Earth for millions of years changes to coal.
- I need to go back to the text to figure out *how* and *why* this happens. I'll look in the first paragraph and use the Close Reader Habit as I search for details that describe the causes.
- I find the first detail in the fourth sentence. I read that being buried for so long deep below the Earth put the plant matter under intense heat and pressure. I'll circle that cause. However, I still don't know the full reason why the plant matter became coal, so I read on.
- I learn that the heat and pressure then caused the the chemical and physical characteristics of the plant matter to change. Eventually, it turned to coal. I'll circle those two sentences too.
- Now I will summarize in my own words all the details that explain why coal forms: *The heat and pressure from being buried made the plant matter change. The chemical and physical characteristics changed, making coal.* I'll write these sentences in the first "How and Why It Happens" box.

Think

- Read aloud the Think section. Explain to students that you will reread the first paragraph of the article. Then you will model how to find text evidence to fill in the chart. Use the **Think Aloud** below to guide your modeling.
- Revisit the Explore question. Guide students to determine that they need to look for more details, using the Close Reader Habit.
- Encourage students to work with a partner to continue rereading the passage and to complete the chart. Remind students that the Buddy Tip will help them focus on the information they need.
- Ask volunteers to share their completed charts.
- Guide students to see that coal forms by a natural process that involves a sequence of causes and effects. Using coal for power has effects that are both positive (electricity) and negative (pollution).

Talk

- Read aloud the Talk prompt.
- Have partners respond to the prompt. Use the Talk Routine on pp. A52–A53.
- Circulate to check that students are discussing and writing about the meaning of "powerful rock" and the benefits and problems associated with people's use of coal.

Write

- Ask a volunteer to read aloud the Write prompt.
- Invite a few students to tell what the prompt is asking them to do.
- Make sure students understand that they need to explain both a benefit of and a problem caused by using coal. Point out that the details they circle in the text will support their writing.
- Have students turn to p. 58 to write their responses.
- Use Review Responses on p. 58 to assess students' writing.

Wrap Up

- Ask students to recall the Learning Target. Have them explain how knowing what happened and why or how it happened helped them better understand this article.


Guided Practice
Get Started

Today you will read another science text about a natural resource. First, you will read to understand what the text is about. Then you will reread with a partner to look for specific details to answer a question.

Read

- Read aloud the title of the text. Ask students to share what they know about what gold looks like and how it is used.
- Have students predict what the text will be about based on the title and the illustration.
- **Read to Understand** Have students read the text independently. Tell them to place a check mark above any confusing words and phrases as they read. Remind students to look inside, around, and beyond each unknown word or phrase to help them figure out its meaning. Use the Word Learning Routine on pp. A50–A51.
- When students have finished reading, clarify the meanings of words and phrases they still find confusing. Then use the questions below to check understanding. Encourage students to identify details in the text that support their answers.

What properties does gold have? (*It is an element; it is malleable and ductile; it conducts heat and electricity very well.*)

Why do people make alloys with gold? (*Gold by itself is very soft; mixing gold with other metals makes it stronger.*)

What uses does gold have? (*as jewelry, statues, decorations, an electrical conductor, and a radiation reflector*)

What is the text mostly about? (*It is about the properties of gold and its uses, past and present.*)


English Language Learners
Word Learning Strategy

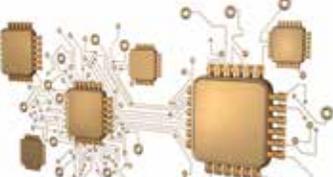
- **Read to Analyze** Read aloud the Close Reader Habit on p. 56 to set the purpose for the second read. Then have students reread the text with a partner and discuss any questions they might have.



by Carl Gelb

- 1 People have valued gold for thousands of years. Because of the metal's durability, gold ornaments, statues, and jewelry look as brilliant today as when the artists of ancient Egypt and other cultures crafted them thousands of years ago. Gold is one of nature's true wonders.
- 2 **Properties:** Gold is an element. It cannot be broken down into simpler substances. Gold is also very malleable, which means it is easily flattened into a thin sheet. Gold is also ductile, which means it can be pulled into a wire. For these reasons, gold is useful in making jewelry. One ounce of gold can become 187 square feet of gold leaf or one mile of gold wire. Gold also conducts heat and electricity very well.
- 3 **Alloys:** Pure gold is very soft. Because it's so soft, gold is often mixed with other metals to make a mixture, or alloy, that is stronger than gold alone. Adding silver, copper, and zinc to gold produces the color we associate with jewelry.
- 4 **Today's Uses:** In the past, gold was mainly used for jewelry, statues, and other decorations. But today we use gold for more than just its beauty. It is an excellent conductor of electricity. This means that electricity flows through it easily. As a conductor, gold coats electrical parts inside our cell phones and computers. It helps speed the flow of electricity. Thin films of gold also reflect radiation on satellites, the sun visors of space suits, and the windows of skyscrapers. Gold's uses are many and important!

Computer Microchips ▶



Close Reader Habits

What was gold used for in the past, and what is it used for today? Reread the article. **Underline** details that tell how people have used gold in the past and the present.

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English Language Learners
 Develop Language

Concept Vocabulary On the board, write *durable* and *electric*.

- Have students give definitions, synonyms, examples, or words in their native languages to help define each one. Give examples of each word in sentences as needed. Be sure to focus on the meaning of each word as it applies to the text.
- Ask students to scan the text to find related words: *durability*, *electricity*, *electrical*. Review each word to show how the base word plus an affix creates a new, related word.

Word Learning Strategy
 Use a Dictionary

- Draw students' attention to paragraph 2. Read aloud the first sentence, pointing out the word *element*. Ask:
What do you think the word *element* means? Elicit ideas. Then ask: **Are you sure that's the meaning? How can we find out for sure?** (*use a dictionary*)
- Have students look up *element* in student-friendly dictionaries. Discuss whether students guessed the meaning correctly, as well as what additional information they learned from the dictionary entry.

L.4.4c

Think Use what you learned from reading “Gold” to respond to the following questions.

- 1 The following question has two parts. First, answer Part A. Then answer Part B.

Part A

Which statement **best** explains why gold is used for making jewelry?

- A Gold cannot be broken down into a simpler substance.
- B Gold can be made into a mile of gold wire.
- C** Gold is durable and easily flattened, stretched, and shaped.
- D Gold is a good conductor of heat and electricity.

Part B

Read paragraph 2. Underline **two** sentences that **best** support your answer to Part A.

Properties: Gold is an element. It cannot be broken down into simpler substances. Gold is also very malleable, which means it is easily flattened into a thin sheet. Gold is also ductile, which means it can be pulled into a wire. For these reasons, gold is useful in making jewelry. One ounce of gold can become 187 square feet of gold leaf or one mile of gold wire. Gold also conducts heat and electricity very well.



In science texts, the cause of what happens often appears near words such as *because* and *reasons*.

Talk

- 2 Explain why people have valued gold for thousands of years. Use the chart on page 59 to organize your thoughts about people’s use of gold in the past and the present.

Write

- 3 **Short Response** Use the information in your chart to explain what makes gold useful and why people valued gold in the past and today. Include at least **two** details from the passage to support your answer. Use the space provided on page 59 to write your response.

HINT Think about how people’s use of gold today is similar to and different from its use in the past.

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Think

- Have students work with a partner to complete item 1. Draw attention to the boldface words **best** in Part A and **two** and **best** in Part B.

TIP Explain to students that paragraph 2 has a clue that signals why gold is used for jewelry. Tell them to find the clue and look at the surrounding text to try to determine the causes.

Answer Analysis

When students have finished, discuss correct and incorrect responses.

1 Part A

The correct choice is C. Gold is good for making jewelry because it is easy to shape.

- **A, B,** and **D** describe characteristics of gold but not ones desirable for jewelry making.

Part B

Students should underline sentences 3 and 4.

Sentence 5 (*For these reasons, gold is useful in making jewelry*) shows that the two preceding sentences best support the answer to Part A.

DOK 3

● **Monitor Understanding**

● **Integrating Standards**

Talk

- Have partners discuss the prompt. Emphasize that students should support their ideas with text details.
- Circulate to clarify misunderstandings.

Write

- Ask a volunteer to read aloud the Write prompt.
- Invite students to tell what the prompt is asking them to do. Make sure they understand that they need to describe why gold is both useful and valued. Call attention to the HINT.
- Have students turn to p. 59 to write their responses.
- Use Review Responses on p. 59 to assess students’ writing.

Wrap Up

- Ask students to recall the Learning Target. Have them explain how thinking carefully helped them better understand this science text.

● **Integrating Standards**

Use these questions to further students’ understanding of the text:

- **What is the main idea of “Gold”?** **What key details support the main idea?** (Main idea: *Because of its unique properties, gold has been valued and used for thousands of years.* Key details: *Gold is durable yet soft and easily formed into jewelry. Because it is a good conductor of heat and electricity, it is also used today in computers and cell phones.*) **DOK 2 RI.4.2**
- **What clue in the text helps you understand what an alloy is?** (*The text says, “gold is often mixed with other metals to make a mixture, or alloy,” which shows that an alloy is a mixture of metals.*) **DOK 3 RI.4.4**

● **Monitor Understanding**

If... students have difficulty identifying supporting details to answer part B of item 1,

then... ask them to visualize how jewelry is made. As needed, explain that jewelry makers work with metal to form rings for fingers, delicate chains for necklaces, and thin sheets to cover other, cheaper metals (such as with gold leaf). Then have them review the text to find evidence of these techniques: *“it is easily flattened into a thin sheet”; “it can be pulled into a wire.”*

Remind students to eliminate sentences that do not answer the question, such as *Gold also conducts heat and electricity very well.*


Modeled and Guided Instruction

Write

- Remember to use the Response-Writing Routine on pp. A54–A55.

Review Responses

After students complete the writing activity, help them evaluate their responses.

- 3** Responses may vary, but students should mention how coal is prepared for use, what it is used for, and why coal use is both helpful and harmful. See the sample response on the student book page.

DOK 3



Write Use the space below to write your answer to the question on page 55.

A POWERFUL ROCK

- 3 Short Response** Explain how people process and use this “powerful rock.” Include at least **one** benefit and **one** problem caused by people’s use of coal. Include details to support your response.

HINT Find details about benefits and problems, such as “supply energy” and “harmful chemicals.”

Sample response: People dig up the coal. Then they clean it and crush it so it can be burned. Burning coal gives people electricity. This is a benefit. Burning coal also causes pollution by putting bad chemicals into the air. This is a problem.



Don't forget to check your writing.

Check Your Writing

- Did you read the prompt carefully?
- Did you put the prompt in your own words?
- Did you use the best evidence from the text to support your ideas?
- Are your ideas clearly organized?
- Did you write in clear and complete sentences?
- Did you check your spelling and punctuation?

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Scaffolding Support for Reluctant Writers

If students are having a difficult time getting started, use the strategies below. Work individually with struggling students, or have students work with partners.

- Circle the verbs in the prompt that tell you what to do, such as *describe*, *explain*, or *compare*.
- Underline words and phrases in the prompt that show what information you need to provide in your response, such as *causes*, *reasons*, or *character traits*.
- Talk about the details from the text that you will include in your response.
- Explain aloud how you will respond to the prompt.

Independent Practice

Get Started

Today you are going to read one more science article and use what you have learned about using text details to explain scientific ideas and processes, including what happened and why.

- Ask volunteers to explain why thinking carefully about information in scientific texts will help readers better understand the natural world, including what happens and why or how it happens. Encourage students to use the Academic Talk words and phrases in their responses.

 English Language Learners

Read

You are going to read the science article independently and use what you have learned to think and write about the text. As you read, remember to look closely at the key ideas and the details that support them. Some of this information may explain what, why, or how something happened.

- Read aloud the title of the passage, and then encourage students to preview the text, paying close attention to the heads, photographs, and the food chart on p. 61.
- Call attention to the Words to Know in the upper left of p. 60.
- If students need support in reading the passage, you may wish to use the Monitor Understanding suggestions.
- When students have finished, have them complete the Think and Write sections.

 Monitor Understanding

Read

Minerals

by Steven Dowshen, MD, *Kids' Health Online*

WORDS TO KNOW

As you read, look inside, around, and beyond these words to figure out what they mean.

- immune
- supplements
- function

- 1 Did you ever notice how TV commercials for breakfast cereal always mention vitamins and minerals? But when you think of minerals, food isn't the first thing that comes to mind. Aren't minerals something you find in the earth, like iron and quartz?
- 2 Well, yes, but small amounts of some minerals are also in foods—for instance, red meat, such as beef, is a good source of iron.
- 3 Just like vitamins, minerals help your body grow, develop, and stay healthy. The body uses minerals to perform many different functions—from building strong bones to transmitting nerve impulses. Some minerals are even used to make hormones or maintain a normal heartbeat.

MACRO and TRACE

- 4 The two kinds of minerals are: macrominerals and trace minerals. *Macro* means “large” in Greek (and your body needs larger amounts of macrominerals than trace minerals). The macromineral group is made up of calcium, phosphorus, magnesium, sodium, potassium, chloride, and sulfur.
- 5 A *trace* of something means that there is only a little of it. So even though your body needs trace minerals, it needs just a tiny bit of each one. Scientists aren't even sure how much of these minerals you need each day. Trace minerals include iron, manganese, copper, iodine, zinc, cobalt, fluoride, and selenium.
- 6 Let's take a closer look at some of the minerals you get from food.



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 English Language Learners

Build Meaning

Build Background Call students' attention to the food chart on p. 61 and the headings on pp. 61–62. Ask them what they notice. (*The words are the same in the chart and the heads.*)

- Read each word aloud to students. Then have students read each word with you. Ask:
Think about the title of the article. What do you think these words have in common? (*They all name minerals.*)
- Ask students if they know what a mineral is. If students describe things found in the earth, prompt them to think of other sources of minerals. Ask what products advertise that they have minerals in them. (*breakfast cereals, milk, yogurt, and other foods*)
- Have students look again at the food chart and identify the foods that have each type of mineral.

CALCIUM

- 7 Calcium is the top macromineral when it comes to your bones. This mineral helps build strong bones so you can do everything from standing up straight to scoring that winning goal. It also helps build strong, healthy teeth for chomping on tasty food.



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● **Monitor Understanding**

If... students struggle to read and understand the passage,

then... use these scaffolding suggestions:

Question the Text Preview the text with students by asking the following questions:

- **What types of text features has the author included?** (*headings, photographs, and an illustrated chart of foods*)
- **Based on the title and the text features, what do you predict the passage will be about?**
- **What questions do you have about the text?**

Vocabulary Support Define words that may interfere with comprehension, such as *transmitting* and *nutritious*.

Read Aloud Read aloud the text with students. You could also have students chorally read the text in small groups.

Check Understanding Use the questions below to check understanding. Encourage students to cite details in the text that support their answers.

- **What is a mineral?** (*something found in the earth, like iron and quartz, but also something found in foods*)
- **Why do our bodies need minerals?** (*Minerals help the body grow, develop, and stay healthy. They help the body perform different functions.*)
- **What is the article mostly about?** (*different types of minerals that are important for good health and why they are important*)

Independent Practice

Integrating Standards

After students have read the article, use these questions to discuss the passage with them:

- **Based on the information in the chart, what do you think might happen if a person eats a lot of broccoli?**

(A person who eats a lot of broccoli will have enough calcium and potassium.)

DOK 1 RI.4.7

- **Based on the information in paragraph 9, what might happen if a person has too little potassium in his or her body?**

(If a person has too little potassium, his or her body might not have a proper balance of water, which would cause problems for blood and body tissues such as muscles.)

DOK 3 RI.4.1

- **What is the meaning of the word *supplements* in paragraph 11? Use the context to help you define the word.**

(Supplements are products that provide extra minerals; you can take them if you don't get enough minerals from your food.)

DOK 2 L.4.4a

- **What might happen to a person who eats only one type of food, such as meats or fruits? Support your answers with facts from the text.**

(If someone ate only one type of food, that person might get too much of one mineral and not enough of other important minerals. If that happened, the person would probably develop health problems. They might have weak bones or muscles or not get enough oxygen. Their nervous system or immune system might not work properly.)

DOK 3 RI.4.1

● Theme Connection

IRON

- 8 The body needs iron to transport oxygen from your lungs to the rest of your body. Your entire body needs oxygen to stay healthy and alive. Iron helps because it's important in the formation of hemoglobin (say: HEE-muh-glo-bun), which is the part of your red blood cells that carries oxygen throughout the body.

POTASSIUM

- 9 Potassium (say: puh-TAH-see-um) keeps your muscles and nervous system working properly. Did you know your blood and body tissues, such as muscles, contain water? They do, and potassium helps make sure the amount of water is just right.

ZINC

- 10 Zinc helps your immune system, which is your body's system for fighting off illnesses and infections. It also helps with cell growth and helps heal wounds, such as cuts.
- 11 When people don't get enough of these important minerals, they can have health problems. For instance, too little calcium—especially when you're a kid—can lead to weaker bones. Some kids may take mineral supplements, but most kids don't need them if they eat a nutritious diet. So eat foods with those minerals and stay healthy!



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● Theme Connection

- Remind students that the theme of this lesson is Minerals That Matter. Ask students to tell you what a mineral is. *(a natural substance that is in the earth and in foods)*
- Ask students how all three passages in this lesson relate to the theme.
- Have students recall one fact or idea they learned about minerals from reading the passages in this lesson. Record individual responses and discuss.

Think Use what you learned from reading the science article to respond to the following questions.

1 The box below lists four benefits to your body from minerals in food.

builds strong bones and teeth
 helps muscles and the nervous system work properly
 transports oxygen from the lungs to the rest of the body
 helps the immune system

Complete the table below by writing each benefit in the correct box.

Mineral	Why Your Body Needs the Mineral
zinc	helps the immune system
calcium	builds strong bones and teeth
potassium	helps muscles and the nervous system work properly
iron	transports oxygen from the lungs to the rest of the body

2 Read the sentence from the passage.

The body needs iron to transport oxygen from your lungs to the rest of your body.

What does the root *trans* mean in the word transport?

- A many
- B all
- C across
- D against

Think

- Use the Monitor Understanding suggestions to support students in completing items 1–3.

● Monitor Understanding

Answer Analysis

When students have finished, discuss correct and incorrect responses.

1 **See the answers on the student book page.** Remind students that this item simulates drag-drop items they may see on computer-based assessments.

DOK 2 RI.4.3

2 **The correct choice is C.** *Trans* describes the type of action used to *port*, or “carry,” the oxygen across the body.

- A, B,** and **D** do not describe actions involved in helping oxygen move from the lungs to the rest of the body.

DOK 2 L.4.4b

● Monitor Understanding

If... students struggle to complete the items,
then... you may wish to use the following suggestions:

Read Aloud Activities

- As you read, have students note any unfamiliar words or phrases. Clarify any misunderstandings.
- Discuss each item with students to make certain they understand the expectation.

Reread the Text

- Have students complete a chart as they reread.
- Have partners identify key details in each paragraph of text.

 Independent Practice
3 Part A

The correct choice is B. The passage states that minerals from the macromineral and trace categories are needed to maintain health in all parts of the body.

- **A** is incorrect because the passage does not state that macrominerals are more important, only more plentiful.
- **C** is about iron, whereas calcium—a macromineral, not a trace mineral—is more important for bone health.
- **D** contradicts the text because the passage states that a supplement is optional.

Part B

The correct choices are D, E, and F. Students should note that the three minerals are macrominerals and trace minerals, and all are necessary to overall health.

- **A** is a general statement about all minerals, not a statement about macrominerals and trace minerals.
- **B** and **C** say what macrominerals and trace minerals are, not why they are needed.

DOK 3 RI.4.3

- 3** The following question has two parts. First, answer Part A. Then answer Part B.

Part A

What conclusion about macrominerals and trace minerals is supported by the passage?

- A** Macrominerals are more important because they exist in larger quantities than trace minerals.
- B** Macrominerals and trace minerals are needed for a healthy heart, blood and tissues, and immune system.
- C** Trace minerals like iron are more important for keeping your bones healthy than macrominerals are.
- D** Macrominerals and trace minerals must come from food and also from supplements.

Part B

Which **three** sentences from the passage **best** support your answer in Part A?

- A** “Just like vitamins, minerals help your body grow, develop, and stay healthy.”
- B** “The two kinds of minerals are: macrominerals and trace minerals. Macro means “large” in Greek (and your body needs larger amounts of macrominerals than trace minerals).”
- C** “Scientists aren’t even sure how much of these minerals you need each day.”
- D** “Calcium is the top macromineral when it comes to your bones.”
- E** “The body needs iron to transport oxygen from your lungs to the rest of your body.”
- F** “They do, and potassium helps make sure the amount of water is just right.”

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 **Monitor Understanding**

If... students don’t understand the writing task,

then... read aloud the writing prompt. Use the following questions to help students get started:

- **What is the prompt asking you to write about?**
- **Do you need to reread the text to find more information?**
- **How will you identify the information you need to include?**
- Have partners talk about how they will organize their responses.
- Provide a graphic organizer to assist students, if needed.

 **Write**

4 Short Response What are the two main types of minerals? Identify examples of each type, and explain how our bodies get them. Use details from the article and the food chart in your response.

Sample response: The two kinds of minerals are macrominerals and trace minerals. Our bodies need both kinds of minerals to stay healthy. Macrominerals such as calcium are minerals that our bodies need in large amounts. Trace minerals are minerals that our bodies need in small amounts. Zinc and iron are trace minerals. We can get these minerals by eating healthy foods.

 **Learning Target**

You've learned how to think carefully about information that answers *what, how, and why* questions in science texts. Explain how this can help you develop a deeper understanding of a text and the world around you.

Responses will vary, but students should demonstrate an understanding of the importance of identifying and analyzing the main idea and key details that answer *what, how, and why* questions in scientific texts.

Write

• Tell students that using what they read, they will compose a short response to the writing prompt.

● **Monitor Understanding**

Review Responses

After students have completed each part of the writing activity, help them evaluate their responses.

4 Display or pass out copies of the reproducible **2-Point Writing Rubric** on p. TR10. Have students use the rubric to individually assess their writing and revise as needed.

When students have finished writing, evaluate their short responses. Answers will vary but should show that people need to eat a variety of foods in order to get the minerals they need to stay healthy. See the sample response on the student book page.

DOK 3 RI.4.3, W.4.9b

Wrap Up

Learning Target

- Have each student respond in writing to the Learning Target prompt.
- When students have finished, have them share their responses. This may be done with a partner, in small groups, or as a whole class.

4 2-Point Writing Rubric

Points	Focus	Evidence	Organization
2	My answer does exactly what the prompt asked me to do.	My answer is supported with plenty of details from the text.	My ideas are clear and in a logical order.
1	Some of my answer does not relate to the prompt.	My answer is missing some important details from the text.	Some of my ideas are unclear and out of order.
0	My answer does not make sense.	My answer does not have any details from the text.	My ideas are unclear and not in any order.