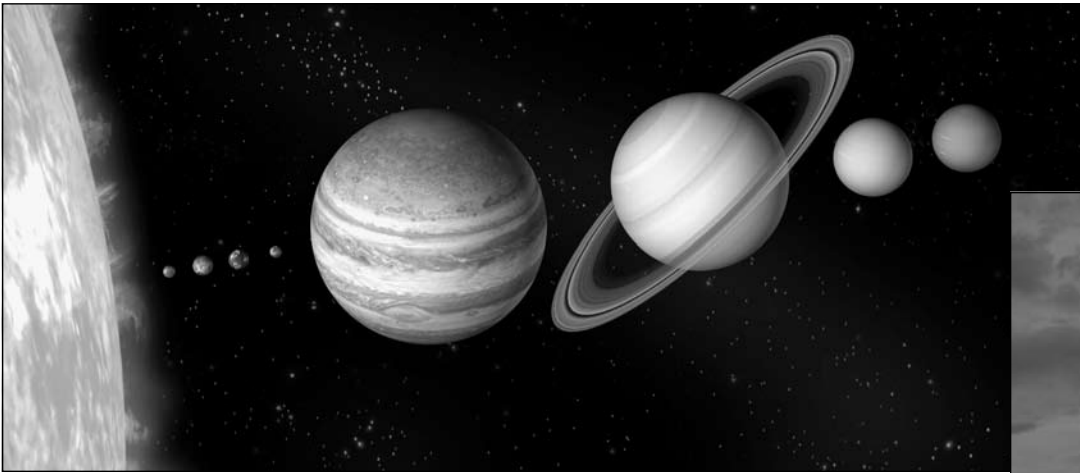


Chapter 1

The Physical Earth



1 OUR SOLAR SYSTEM

Our home in the universe is planet Earth. It is one of eight planets that **orbit**, or circle, the sun. The sun is a star, that is, a giant ball of hot gases. It is the center of our **solar system**. There are billions of other stars in the sky, but the sun is the star closest to Earth. Our solar system also includes moons, which orbit planets. The moon we see in the night sky orbits Earth.

We usually list our solar system's planets in order of their distance from the sun: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. They can be divided into two groups: terrestrial planets and gas giant planets.

Terrestrial, or Earth-like, planets have solid, rocky surfaces. Mercury, Venus, Earth, and Mars are **terrestrial planets**. Earth is the only planet that has large amounts of liquid water, and it is the only planet that has life. Astronomers (scientists who study the stars and planets) believe that a long time ago, Mars had rivers and oceans just like Earth, but that now all the water is either frozen or underground.

1

orbit

to travel in a circle around a larger object

2

solar system

the sun and the planets that move around it

3

terrestrial planet

a planet with a solid, rocky surface

gas giant planet

a planet made of gases,
not solid rock

Gas giant planets are much larger than terrestrial planets. All gas giant planets are made of gases, not solid rock. These planets have rings around them. The rings are made of tiny pieces of rock, dust, or ice. Jupiter, Saturn, Uranus, and Neptune are gas giant planets. Jupiter is the largest planet. It is about a thousand times bigger than Earth.

Outside of our solar system, there are billions of other stars. Astronomers have discovered that some of these stars have planets that orbit them. This means that there are other solar systems in the universe in addition to our own. Perhaps we will even find another planet with life on it someday.

The Story of Pluto

Are there eight or nine planets in our solar system? Before 1930, everyone thought there were eight. Then in 1930, a young man, with no formal training in astronomy, surprised the world. Using a telescope he had made himself, 24-year-old Clyde Tombaugh discovered a new planet in our solar system: Pluto. Pluto is very small, smaller than Earth's moon. It is also farther from the sun than the other planets, so it is colder and darker. After Tombaugh's discovery, people accepted the fact that our solar system had nine planets.

Then, in 2006, the International Astronomical Union (IAU) decided that a planet has to have certain features. For example, it has to make a circular orbit around the sun. It also has to be big enough and strong enough to move away objects in its path. Pluto differs from the other planets in both these ways. First, Pluto has a more irregular orbit. It is not a circle, and it even crosses Neptune's orbit. In addition, Pluto is not strong enough to move objects out of its way as it orbits the sun. For these reasons, the IAU has reclassified Pluto from a planet to a plutoid. So now scientists tell us once again that there are only eight planets.



After you read

Task 1 ASKING AND ANSWERING QUESTIONS ABOUT A TEXT

Asking and answering questions about a text is a good way to make sure you have understood what you read. You can do it alone or with a partner.

- 1 Reread paragraph 1 of the text “Our Solar System.” Then, with a partner, practice asking and answering questions about what you read. Use the questions below. Add at least one more question to the list.
 - 1 How many planets are there in our solar system?
 - 2 What does *orbit* mean?
 - 3 Is the sun a planet or a star?
 - 4 (Add your question.)
- 2 Now reread paragraph 2 of the text. Write two or three questions about the paragraph. Then take turns asking and answering the questions with your partner.
- 3 Reread the rest of the text and the boxed text “The Story of Pluto.” Continue asking and answering questions with your partner.

Task 2 BUILDING VOCABULARY: WORDS FROM LATIN AND GREEK

Many English words, or parts of words, come from other languages. Words that come from Latin and Greek are especially common in science. Look at these examples:

terr- means “earth” or “land”
sol- means “sun”
astro- means “star”

Becoming familiar with word parts from Latin and Greek will help you understand some of the new words you see in science texts.

- 1 Look back at the text “Our Solar System” and the boxed text “The Story of Pluto,” and put a check (✓) above the words that start with *terr-*, *sol-*, or *astro-*.
- 2 Start a chart of word parts from Latin and Greek in your notebook. Follow this model:

Word part from Latin or Greek	Meaning	English example	Meaning
<i>terr-</i>	<i>earth, land</i>	<i>terrestrial</i>	<i>relating to Earth</i>

Task 3 BUILDING VOCABULARY: CLUES THAT SIGNAL DEFINITIONS



When you read a text with many unfamiliar words, try to understand it without stopping to look up every new word in the dictionary. The definition of a new word is often right there in the text. For example, look at these sentences from the text “Our Solar System”:

- It is one of eight planets that **orbit**, or circle, the sun.
- The sun is a **star**, that is, a giant ball of hot gases.
- **Terrestrial**, or Earth-like, planets have solid, rocky surfaces.
- **Astronomers** (scientists who study the stars and planets) believe that a long time ago, Mars had rivers and oceans just like Earth.

Notice how the sentences present the definitions in different ways.

- 1 Fill in the blanks below with bolded words and phrases from the box. In the first blank for each item, write the word that is defined. In the second blank, write the definition.

- 1 _____ *orbit* _____, or _____ *circle* _____, ...
- 2 _____, that is, _____.
- 3 _____, or _____, ...
- 4 _____ (_____) ...

- 2 Fill in each blank below with an appropriate word from the phrases in step 1.

- 1 People cannot live on a _____ because it is too hot.
- 2 _____ use telescopes to learn about the planets in our solar system.
- 3 The sun does not have a _____ environment.
- 4 Planets _____ stars, but they do not circle moons.

- 3 On a separate piece of paper, write three sentences that include definitions of the words below. Use *or*, *that is*, or parentheses in your sentences. Be sure to use correct punctuation.

- 1 telescope *A telescope (an instrument that makes faraway objects look larger) is an important tool for an astronomer.*
- 2 solar system
- 3 Mercury or Pluto
- 4 gas giant planet

Task 4 LANGUAGE FOCUS: PARTS OF SPEECH

An understanding of how the parts of speech work in English can help you understand what you read. It can also help you write clear and logical sentences. In this chapter, we review three parts of speech.

A **noun** is a person, place, thing, or idea (*planet, moon, belief*).

A **verb** is an action or a state of being (*orbit, be, have*).

An **adjective** describes a noun or pronoun (*rocky, giant, hot*).

- 1 Reread paragraph 1 of the text “Our Solar System.” Then do the following:

- 1 Underline all the nouns.
- 2 Draw two lines under all the verbs.
- 3 Circle all the adjectives.

Compare your answers with a partner’s.

- 2 Read the paragraph below. Label each noun (*n.*), verb (*v.*), and adjective (*adj.*).

n. *v.* *adj.*
Mars is an interesting planet. In some ways, it is similar to Earth. It has weather and seasons. It also has canyons and mountains. However, Mars is a very different planet from Earth. It is much smaller than Earth, and it is much colder. In addition, scientists have not found any life on Mars.

- 3 Read the sentences below. There is a missing word in each one. Decide what part of speech is missing, and write it in the first blank.

- verb* 1 Pluto _____ two small moons.
_____ 2 Mercury is a _____ planet.
_____ 3 Saturn has many beautiful _____.
_____ 4 Earth has one _____.
_____ 5 Some people _____ there is life on other planets.

- 4 Now complete each sentence in step 3 with an appropriate word. Use the part of speech to help you. Compare your sentences with a partner’s.

Example: Pluto has two small moons.

Task 5 LANGUAGE FOCUS: COMPARATIVE ADJECTIVES



A **comparative adjective** shows the difference between two people, places, or things. Sometimes a comparison includes a group of people, places, or things. Look at these examples:

- Tombaugh was **younger than** most other astronomers when he discovered Pluto.
- Jupiter is **farther from the sun than** Earth.
- Saturn's rings are **more beautiful than** Jupiter's rings.
- Venus is **hotter than** the other planets in our solar system.

To form comparative adjectives, follow these guidelines:

For **one-syllable adjectives**, add *-er*. If the adjective ends in *e*, add only *-r*.

small → smaller

dark → darker

close → closer

For **one-syllable adjectives that end with a single vowel and a consonant**, double the final consonant and add *-er*.

hot → hotter

big → bigger

red → redder

For **adjectives with two syllables or more**, add *more* before the adjective. If the adjective ends in *y*, change the *y* to *i* and add *-er*.

important → more important

solid → more solid

happy → happier

Irregular adjectives do not follow patterns. Check your dictionary for a complete list.

good → better

bad → worse

far → farther

To compare two nouns in the same sentence, use *than* after the comparative adjective and before the second noun.

noun 1		comparative adjective		noun 2
Earth	is	smaller	than	Jupiter.

1 Find and underline the comparative adjectives in paragraph 4 of the text “Our Solar System” and the boxed text “The Story of Pluto.” How many did you find?

2 Write the comparative form of each of these adjectives.

1 dark _____

5 small _____

2 hot _____

6 big _____

3 solid _____

7 strong _____

4 icy _____

8 rocky _____

3 Complete each sentence below with a comparative adjective. Choose from the adjectives in the box, and use each word once. Use correct forms and add *than*. Be sure each sentence is true, based on the information in the texts and the photograph on pages 5–6.

close cold ~~far~~ hot large rocky

1 Uranus is farther from the sun than Mercury.

2 Pluto is _____ Venus.

3 Mars is _____ Pluto.

4 Earth is _____ to the sun _____ Neptune.

5 Mercury is _____ Saturn.

6 Jupiter is _____ Uranus.

4 Compare Jupiter and Pluto. Write three or four sentences, using comparative adjectives and *than*.

Example: *Jupiter is closer to the sun than Pluto.*

1 _____

2 _____

3 _____

4 _____

Preparing to read

PREVIEWING KEY PARTS OF A TEXT

Previewing key parts of a text before you read it will make it easier to understand the main ideas. To preview a text, look carefully at the title, the introduction, and the headings. It is also a good idea to read the first sentence of each paragraph.

1 Read these key parts of the text “Earth’s Four Systems” on pages 13–14:

- the title
- the short introductory paragraph at the beginning of the text
- the headings
- the first sentence of each paragraph

2 Answer the following questions with a partner:

- 1** How many systems does Earth have?
- 2** What are their names?

3 Now complete the chart below.

1 Write the names of Earth’s systems in the first column of the chart.

2 Write each of the following key features next to the appropriate system:

living things • water • Earth’s crust and the top layer of the mantle • air

Name of the system	Key feature(s)
<i>lithosphere</i>	<i>Earth’s crust and the top layer of the mantle</i>

Now read

Now read the text “Earth’s Four Systems.” When you finish, turn to the tasks on page 15.

1 Find and underline the comparative adjectives in paragraph 4 of the text “Our Solar System” and the boxed text “The Story of Pluto.” How many did you find?

2 Write the comparative form of each of these adjectives.

1 dark _____

5 small _____

2 hot _____

6 big _____

3 solid _____

7 strong _____

4 icy _____

8 rocky _____

3 Complete each sentence below with a comparative adjective. Choose from the adjectives in the box, and use each word once. Use correct forms and add *than*. Be sure each sentence is true, based on the information in the texts and the photograph on pages 5–6.

close cold ~~far~~ hot large rocky

1 Uranus is farther from the sun than Mercury.

2 Pluto is _____ Venus.

3 Mars is _____ Pluto.

4 Earth is _____ to the sun _____ Neptune.

5 Mercury is _____ Saturn.

6 Jupiter is _____ Uranus.

4 Compare Jupiter and Pluto. Write three or four sentences, using comparative adjectives and *than*.

Example: *Jupiter is closer to the sun than Pluto.*

1 _____

2 _____

3 _____

4 _____

The interconnections of Earth's systems

6

The lithosphere, the hydrosphere, the atmosphere, and the biosphere connect with each other in important ways. We humans are part of the biosphere, but we live on the lithosphere. We depend on the atmosphere for air to breathe and the hydrosphere for water to drink. In fact, these connections are so strong that a change in one system can affect the others. Consider this example: Driving a car contributes to air pollution in the atmosphere. Air pollution causes Earth to grow warmer. Warmer temperatures cause important changes in the hydrosphere: Glaciers melt and ocean levels rise. These changes to the hydrosphere affect the humans, animals, and plants of the biosphere. For example, people who live in coastal areas along the ocean are in danger of losing their homes because of **floods**. The polar bear is gradually losing its **natural habitat** because of warming temperatures in the Arctic. When you think about these interconnections among the systems, it is easy to see that our planet is very complex.

flood

a large amount of water covering an area that is usually dry

natural habitat

the place where an animal or a plant usually lives



Biking instead of driving helps reduce air pollution.
(Of course, it's safer to wear a helmet!)

After you read

Task 1 HIGHLIGHTING

One way to help you remember what you have read is to highlight important information. You can highlight key words and ideas in a text by marking them in colors that are easy to see. Remember to highlight only the important information. A text that has too many highlighted sentences is not useful.

- 1 | Look back at the text “Earth’s Four Systems.” Highlight the names of Earth’s systems and the most important feature of each one.
- 2 | Using a different color, highlight two examples of how Earth’s systems interconnect.
- 3 | Compare your work with a partner’s.

Task 2 BUILDING VOCABULARY: WORDS FROM LATIN AND GREEK

Remember that many words used in science come from Latin or Greek. Some of these words have two parts. Knowing the meaning of the parts can help you understand the meaning of the word. For example, *hemisphere* is made up of *hemi-* (half) and *sphere* (ball). The word *hemisphere* means “half of Earth,” which is shaped like a ball.

- 1 | Based on the information in the text “Earth’s Four Systems,” match the word parts in the left column with their meanings on the right.

_____ 1 <i>litho-</i>	a water
_____ 2 <i>hydro-</i>	b life
_____ 3 <i>atmo-</i>	c rock, stone
_____ 4 <i>bio-</i>	d gas, vapor
- 2 | Circle the correct word in each sentence below.
 - 1 A spherical cloud is shaped like a (square / circle / diamond).
 - 2 Lithology is the study of the physical qualities of (rocks / water / gases).
 - 3 Countries that use hydropower to create energy are using (water / rocks / air).
 - 4 Atmospherology is the study of (water / rocks / gases).
 - 5 A biologist works with (rocks / gases / living things).

- 3 Look back at the sentences in step 2. Circle two examples of the word part *-logy*.
What do you think it means? Write a short definition. _____
Then add *-logy* to your chart of word parts from Latin and Greek.
- 4 Add the words from the box and step 1 on page 15 to your chart of word parts from Latin and Greek. (Review “Building Vocabulary” on page 7 if necessary.)

Task 3 BUILDING VOCABULARY: LEARNING VERBS WITH THEIR PREPOSITIONS



Some verbs often occur with specific prepositions, for example: *benefit from*, *pay for*, *think about*. When you learn a new verb, notice if a preposition follows. Try to learn the verb and the preposition together as a unit.

- 1 Each verb in **bold** frequently occurs with a specific preposition. Fill in the blanks with the correct prepositions. If necessary, you can find the verbs in the text “Earth’s Four Systems.”
 - 1 Its thickness **ranges** _____ about 5 to 80 kilometers. (par. 2)
 - 2 Gases in the atmosphere create air for us to breathe, and they **protect** Earth _____ the sun’s ultraviolet radiation. (par. 4)
 - 3 The lithosphere, the hydrosphere, the atmosphere, and the biosphere **connect** _____ each other in important ways. (par. 6)
 - 4 We **depend** _____ the atmosphere for air to breathe and the hydrosphere for water to drink. (par. 6)
 - 5 Driving a car **contributes** _____ air pollution in the atmosphere. (par. 6)
- 2 Complete the sentences below. First, add the correct preposition for each verb in bold. Then select an appropriate ending from the box.

the sun’s dangerous rays	–238°C to –228°C	good health
other scientists all over the world	a cold environment	

- 1 Scientists use the Internet to **connect** with other scientists all over the world.
- 2 Sunscreen and sunglasses **protect** people _____.
- 3 The temperature on Pluto **ranges** _____.
- 4 Polar bears **depend** _____.
- 5 Drinking clean water and breathing clean air **contribute** _____.

- 3 Complete these sentences with something that is true for you.
- 1 I **depend** _____.
 - 2 The summer temperature where I live **ranges** _____.
 - 3 I want to **contribute** _____.

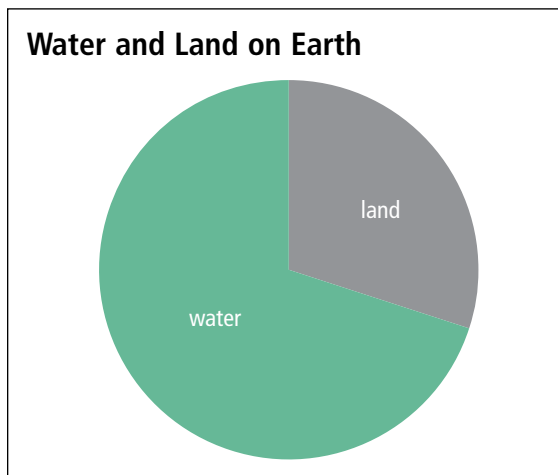
Task 4 USING A PIE CHART TO ORGANIZE STATISTICS



Textbooks often use statistics, that is, a group of facts stated as numbers. Sometimes it is helpful to organize a group of statistics in a pie chart, which shows the parts of a whole. This makes the statistical information easier to read and understand.

- 1 Read the following sentence from the text “Earth’s Four Systems.” Notice how the pie chart on the right organizes the information.

Water covers more than 70 percent of Earth.



- 2 Reread paragraph 3 of the text. On a separate piece of paper, make a pie chart to represent the amount of freshwater and salt water on Earth. Look at your chart and write two sentences about the information. You can start this way:

Approximately _____ percent of water on Earth is freshwater.

- 3 Work in pairs or small groups. Survey your classmates. You can use one of the questions below or ask your own question about our planet.

- *Do you think there is life beyond Earth?*
- *Which of Earth’s four systems are you most interested in learning more about?*

- 4 Make a pie chart to organize the results of your survey. Give the chart a title and write a few sentences about the information. Be prepared to present your chart and your sentences to the class. You can start your sentences this way:

In our class, _____ percent of the students think . . .

In our class, _____ percent of the students are most interested in . . .

Preparing to read

THINKING ABOUT THE TOPIC BEFORE YOU READ

1 Look at these photographs. Then discuss the questions below in a small group.



a



b



c

- 1 Do you know the names or locations of any of the places in the photographs?
- 2 What do they all have in common?
- 3 What are some other famous places made of rock?
- 4 What do people use rocks for? Try to think of at least three uses.
- 5 Did builders use any rocks to construct your school or your home? If so, do you know what kind of rocks they used?
- 6 What are some things in your school or home that are made of rock?

2 Check your answers to step 1 questions 1–4 at the bottom of the page.

Now read

Now read the text “Rocks on Our Planet.” When you finish, turn to the tasks on page 21.

Answers to step 1:
1 a Stonehenge in England, b the Great Pyramids in Egypt, c Machu Picchu in Peru 2 They are all made of rock. 3 Possible answers: the Taj Mahal in India, the Parthenon in Greece, the Great Wall in China, El Tajin in Mexico 4 Possible answers: building, tools, sculpture, landscaping in gardens

3 ROCKS ON OUR PLANET

Earth is a terrestrial planet, that is, a planet with a rocky surface. It is covered with rocks of all ages. The oldest rocks in Earth's crust are more than three billion years old. The youngest ones are just a few minutes old. All rocks are made of minerals, or inorganic (nonliving) matter.

Although different types of rocks form in different ways, they all come from the same original hot material, **magma**, from deep inside Earth. The three main types of rocks are igneous, sedimentary, and metamorphic.

Three main types of rocks

"Igneous" means "relating to fire." When the fiery magma rises up through Earth's crust, it cools and becomes igneous rock. Sometimes the melted rock cools under the surface of the earth, but sometimes magma erupts from a volcano as **lava** and cools on Earth's surface. Granite, basalt, and pumice are examples of igneous rocks.

Although rocks are very strong, wind and rain over time can break off tiny pieces. These pieces of rock often settle at the bottom of a river or ocean in a layer, and they are called sediment. After thousands of years, more layers of sediment form. The weight from all the layers presses the sediment so tightly together that it eventually becomes solid sedimentary rock. Some common sedimentary rocks are limestone, sandstone, and shale.

The heat and pressure deep inside Earth can actually change one type of rock into another. This process is called metamorphism, or the process of changing one thing into another. Rocks that form in this way are called metamorphic rocks. For example, when limestone, a sedimentary rock, is under great heat and pressure for a long period of time, it can change into marble, a metamorphic rock.

The rock cycle

Over time, any type of rock can change into any other type. This process is called the rock cycle. Magma cools and forms igneous rocks. Igneous rocks break into small pieces and form sedimentary rocks. Deep inside Earth, great heat

magma

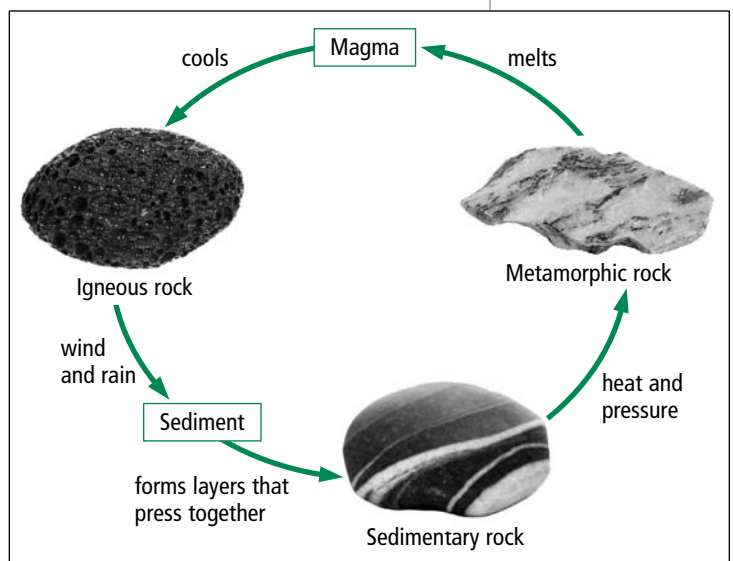
very hot melted, or liquid, rock that is deep inside Earth

lava

hot, melted rock that flows from a volcano

Figure 1.2

The rock cycle



and pressure act on sedimentary and igneous rocks and change them into metamorphic rocks. When all three kinds of rock move even deeper into Earth, they melt, become magma, and the rock cycle begins all over again. In this way, for millions of years, the rocks in Earth's crust have continuously changed form. Rocks are natural recyclers.

Save the Rocks!

There is something very unusual in Narendra Luther's living room – a giant, two billion-year-old rock that goes all the way up through the ceiling to the second floor. This rock is just one of many that formed in Hyderabad, India, billions of years ago. The people in the city have given some of the rocks names, such as Bear's Nose and Stone Heart. Some rocks have become temples, and others have become billboards. A large number have been destroyed to make room for new office buildings, apartments, hotels, and shopping malls. As the city develops, there is less and less room for these giant reminders of Earth's past.

Many people in Hyderabad want to save some of the rocks. The city now has a rock park, and several new buildings include rocks as part of their design, just like Mr. Luther's house. In this way, people can enjoy the new things that come with development, and they can also save part of their past.



The people of Hyderabad hope to save their rocks.

After you read

Task 1 TEST TAKING: ANSWERING MULTIPLE CHOICE QUESTIONS

One common type of question on tests and in textbooks is the multiple choice question. Here are some strategies for answering this type of question:

- Read the question several times. Make sure you understand it before you try to choose an answer.
- Think of the correct answer, and then look for it in the choices.
- Read all the choices before you make a decision. Do not stop reading as soon as you think you have found the correct answer.

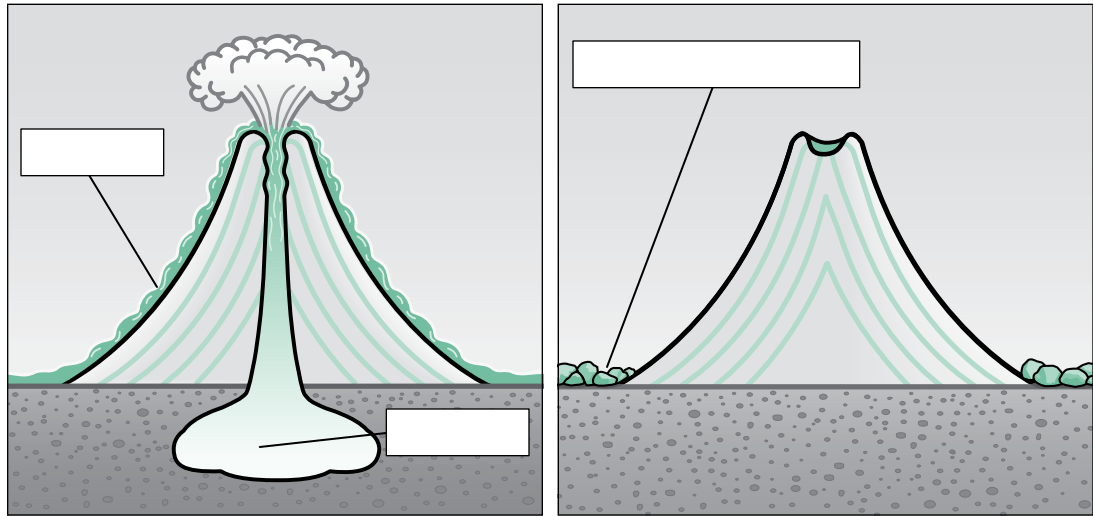
Answer the questions below, based on the text “Rocks on Our Planet.” Then compare your answers with a partner’s.

- 1 What are all rocks made of?
 - a lava
 - b water
 - c fire
 - d minerals
- 2 Which one of the following is a type of rock?
 - a sedimentary
 - b organic
 - c terrestrial
 - d metallic
- 3 Where do igneous rocks form?
 - a on Earth’s surface
 - b under Earth’s surface
 - c in a river
 - d both on and under Earth’s surface
- 4 Where do many sedimentary rocks form?
 - a on Earth’s surface
 - b under Earth’s surface
 - c in a river
 - d in the wind
- 5 What forces create metamorphic rocks?
 - a wind and rain
 - b heat and pressure
 - c cooling and melting
 - d erupting and breaking
- 6 Which process causes rocks to change form continuously over time?
 - a the formation of sediment
 - b the rock cycle
 - c volcanic eruptions
 - d the cooling of magma

Task 2 LABELING DIAGRAMS

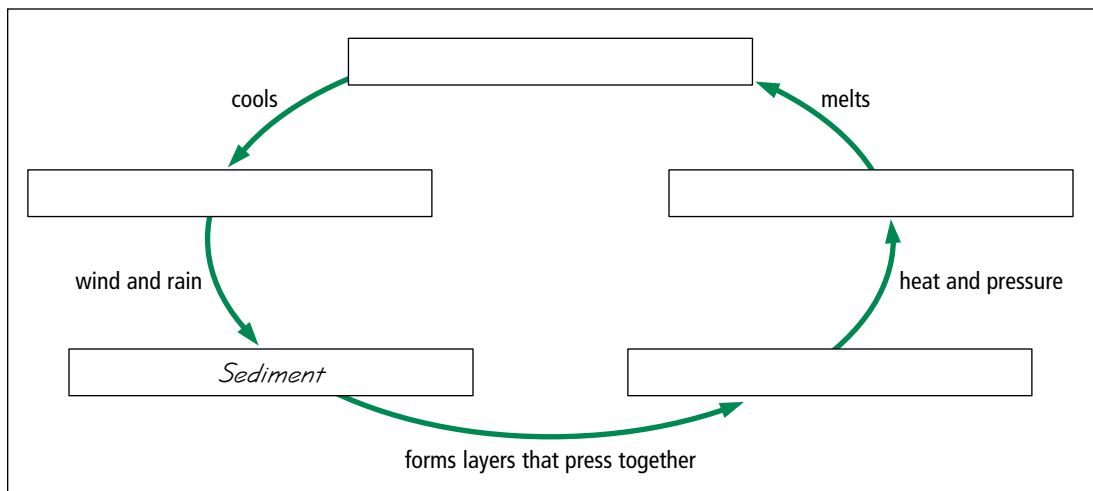
Studying diagrams and labeling them with key words sometimes makes it easier to understand and remember complex information in a text. This strategy is especially helpful when you read science texts.

- 1 Look at the diagrams below. Find and label these terms: *lava*, *magma*, and *igneous rock*.



A volcano during and after eruption

- 2 Look at the diagram of the rock cycle below. Label the blanks with these words: *Metamorphic rock*, *Sedimentary rock*, *Igneous rock*, *Sediment*, and *Magma*.



The rock cycle

- 3 Look back at Figure 1.2 on page 19 to check your work.

Task 3 LANGUAGE FOCUS: SUBJECTS

The **subject** of a sentence names who or what the sentence is about. A sentence in English must have at least one subject. It can be a single noun, a noun phrase (a noun + other words that give more information about the noun), or a pronoun. Pronouns are words that take the place of nouns. The subject pronouns are *I, you, he, she, it, we, they*.

Common mistakes with subjects:

- 1 There is no subject in the sentence.

INCORRECT: Discovered a new planet.

To correct this sentence, add a subject.

CORRECT: **An astronomer** discovered a new planet.

- 2 There are two subjects in a sentence without a connector. One of these subjects is often a pronoun. In English, sentences cannot have a double subject.

INCORRECT: Earth it is a terrestrial planet.

To correct this sentence, delete one of the subjects.

CORRECT: **It** is a terrestrial planet.

Earth is a terrestrial planet.

- 1 Read the following paragraph. The subject of each sentence is underlined.

The lithosphere includes Earth's crust and the top layer of the mantle. The crust is a thin layer of rock that covers the whole planet. The thickness of the crust ranges from about 5 to 80 kilometers. The mantle is the section of Earth directly under the crust. The lithosphere is not one solid piece of rock. Instead, it is broken into many smaller pieces called plates.

- 2 Now read this paragraph and underline the subject of each sentence.

The atmosphere is the air surrounding Earth. It is made up of gases. The primary gas is nitrogen. The gases in the atmosphere create air for us to breathe. They also protect Earth from the sun's ultraviolet radiation.

- 3 In the paragraph below, there are three mistakes with subjects. Mark the mistakes and correct them. Then rewrite the paragraph on a separate piece of paper.

Narendra Luther has something very unusual in his house. Is a giant, two billion-year-old stone. This rock is just one of many in the city of Hyderabad, India. The people they in the city have given names to some of the rocks. Have become temples or billboards, but other rocks have been destroyed to make room for new development.

Task 4 LANGUAGE FOCUS: VERBS



Remember that a sentence in English must have at least one subject. It must also have at least one verb. Verbs are words of action (*erupt, press, move*) or being (*be, have*). Sometimes verbs are one word (*erupt*), sometimes they are two words (*is erupting*) or even three words (*has been erupting*).

Common mistakes with verbs:

- 1 There is no verb in a sentence.

INCORRECT: Earth terrestrial planet.

To correct this sentence, add a verb.

CORRECT: Earth **is** a terrestrial planet.

- 2 There is only half of a verb. This often happens with the *-ing* form. A verb that ends in *-ing* needs a helping verb.

INCORRECT: The volcano erupting.

To correct this sentence, add a helping verb.

CORRECT: The volcano **is** erupting.

The volcano **has been** erupting for two days.

- 1 Reread the first paragraph of the text “Rocks on Our Planet.” Underline the subject of each sentence once. Underline the verb twice.
- 2 Write four sentences about rocks on Earth. Try not to look back at the text. Make sure each sentence has at least one subject and one verb.
- 3 Exchange your sentences with a partner. Underline the subject of each sentence once. Underline the verb twice. Talk about any problems in the sentences with your partner.
- 4 Now reread your own sentences. Make any necessary corrections.

Chapter 1 Writing Assignment

Imagine that someone from another planet is coming to visit Earth and that you are the guide. What would you like to tell the visitor about our planet? Write a list of eight to ten sentences with information that you have learned in this chapter about Earth. Follow the steps and the guidelines below.

1 Have a short conversation with a partner. Talk about the information you would like to share with the visitor. Make a list of your ideas.

2 Now write the sentences.

Guidelines

- Include some information about each of the topics you read about: the solar system, Earth's four systems, and rocks.
- Include some new vocabulary you have learned in this chapter.
- Be sure that each sentence has a subject and a verb (see the Language Focus tasks, pages 23–24).
- Try to include some comparative adjectives (see the Language Focus task, page 10).
- Use subject pronouns correctly (see the Language Focus task, page 23).

3 When you finish, exchange sentences with a partner and read each other's work. Put a check (✓) next to your partner's three best sentences.

4 Discuss the following questions about both sets of sentences:

- 1 Explain why you picked the sentences you did.
- 2 Compare your sentences with your partner's. Did you choose similar information to tell the visitor, or did you choose different things to say?
- 3 Look at the structure of the sentences. Do they all have a subject and a verb? Find and underline the subjects in your partner's sentences. Draw two lines under the verbs.
- 4 Are there any adjectives in the sentences? If so, what do they describe? Circle the adjectives. Find and label any comparative adjectives (CA).

5 Make any changes that you think would improve your sentences and rewrite them.

Preparing to read

BUILDING VOCABULARY: PREVIEWING KEY WORDS

Learning the meaning of key words before you read will introduce you to important ideas in a text and make the text easier to understand.

- 1 Read the following sentences and think about the meanings of the words in **bold**. Use all the words in each sentence to help you.
 - e 1 Earth has seven **continents**. Asia is the largest continent, and Australia is the smallest.
 - _____ 2 The Pacific Ocean surrounds (goes all around) the **islands** of Hawaii.
 - _____ 3 The Pyrenees are mountains that form a **boundary** between France and Spain.
 - _____ 4 The Mid-Atlantic **Ridge** in the Atlantic Ocean is the longest mountain range on Earth.
 - _____ 5 The ocean floor is not flat. It has many tall ridges and deep **trenches**. For example, in the Pacific Ocean, the Mariana Trench is almost 11,000 meters below the surface of the ocean.
 - _____ 6 Earth's crust is not solid. It is made up of many different **plates**.
- 2 Match the following definitions with the words in **bold** in step 1 above. Write the letter of the definition next to the appropriate sentence.
 - a** a line that divides two places or areas
 - b** large pieces of Earth's crust
 - c** a chain of mountains
 - d** areas of land completely surrounded by water
 - e** very large areas of land, often made up of many countries
 - f** long, narrow, deep holes

Now read

Now read the text "Plate Tectonics." When you finish, turn to the tasks on page 29.