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READING FOR INFORMATION
美国中小学生拓展读本
阅读广角
Level 4D
Earth Science & Physical Science
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READING FOR INFORMATION

Earth Science & Physical Science

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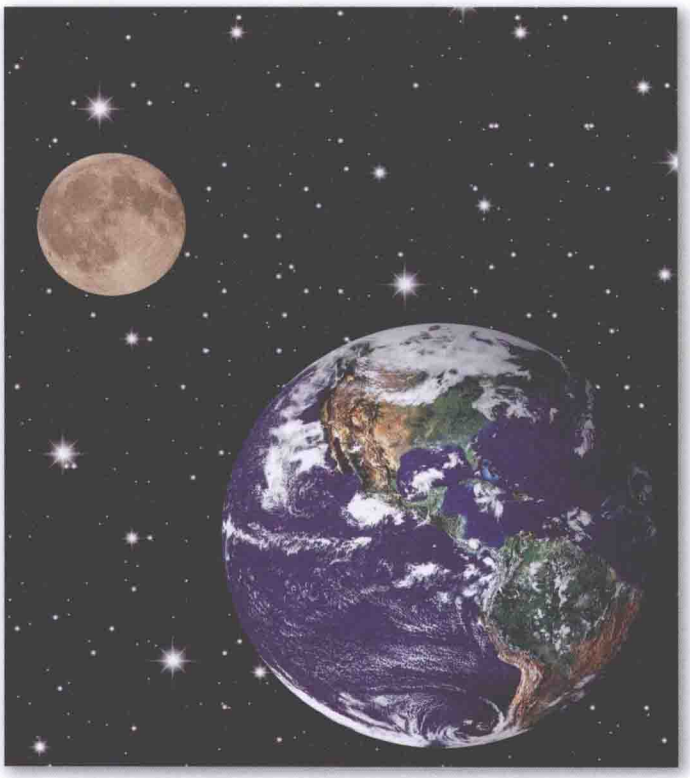
EARTH SCIENCE

Earth and Its Neighbors



READING for INFORMATION
Earth Science

Before You Read

Here are some things you can do to help you read for information.

Features Charts

Charts can help you visually understand information. There are many different kinds of charts.

- Sequence charts and flowcharts show the order of steps in a process or an event.
- T-charts and two-column charts compare or contrast two things.
- Organizational charts show the relationships in an organization, group or family.

This organizational chart describes two groups of objects.

Planet Basics

	Planets	Distance to sun (in kilometers)	Diameter (in kilometers)	Did you know?
Inner Planets	Mercury	58 million	4,879	A year on Mercury lasts 88 days.
	Venus	108 million	12,104	Temperatures on Venus reach about 465° C.
	Earth	150 million	12,756	Earth's atmosphere protects the surface from space hazards.
	Mars	228 million	6,794	Rust gives Mars its reddish color.
Outer Planets	Jupiter	778 million	142,884	Jupiter rotates faster than any other planet.
	Saturn	1,426 million	120,536	Winds on Saturn can blow at 500 meters per second.
	Uranus	2,870 million	51,118	A day on Uranus lasts only about 17 hours.
	Neptune	4,498 million	49,528	Neptune's orbit takes about 165 Earth years.

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Earth Science

Structures Cause and Effect

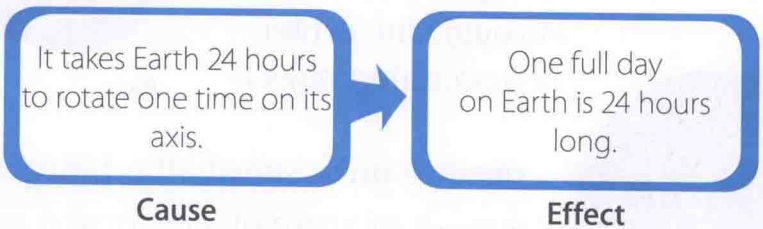
- A cause is the reason something happens. The signal words *when, if* and *because* show cause.
- The effect is what happens. The signal words *then, so* and *therefore* show effect.

The word *because* tells you this is a cause-and-effect sentence.

Because it takes Earth 24 hours to turn one time on its axis, one full day on Earth is 24 hours long.

This sentence explains what causes a day on Earth to last 24 hours.

- You can make a simple diagram to help you identify cause-and-effect relationships when you read.

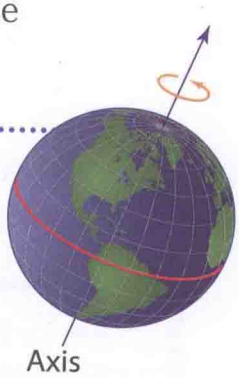


Before You Read

Vocabulary Words to Know

asteroid a small rocky object that orbits the sun

astronomer a scientist who studies the sun, moon, stars, planets, and other bodies in space



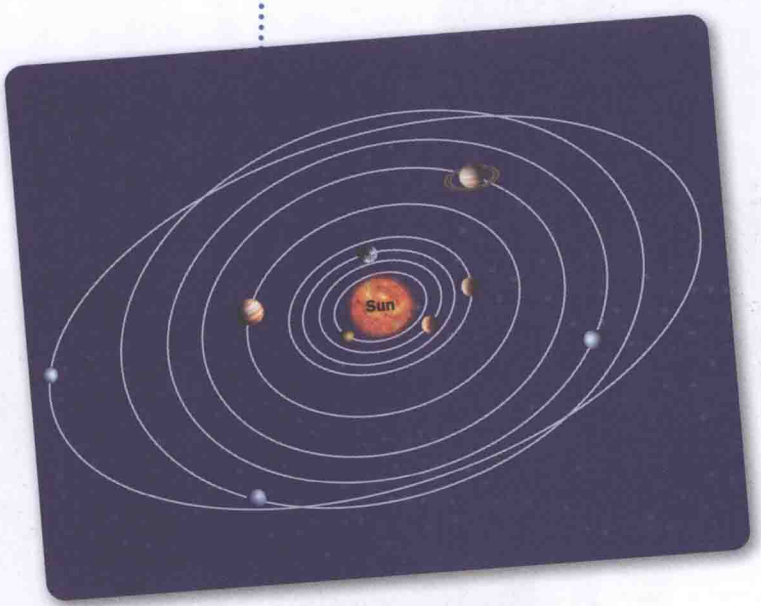
axis a real or imaginary line through the center of a spinning object

comet a dirty snowball orbiting the sun—a mixture of ices, frozen gases, rock, and dust left over from the formation of the solar system

meteor a chunk of rock from space that burns up as it travels through Earth's atmosphere

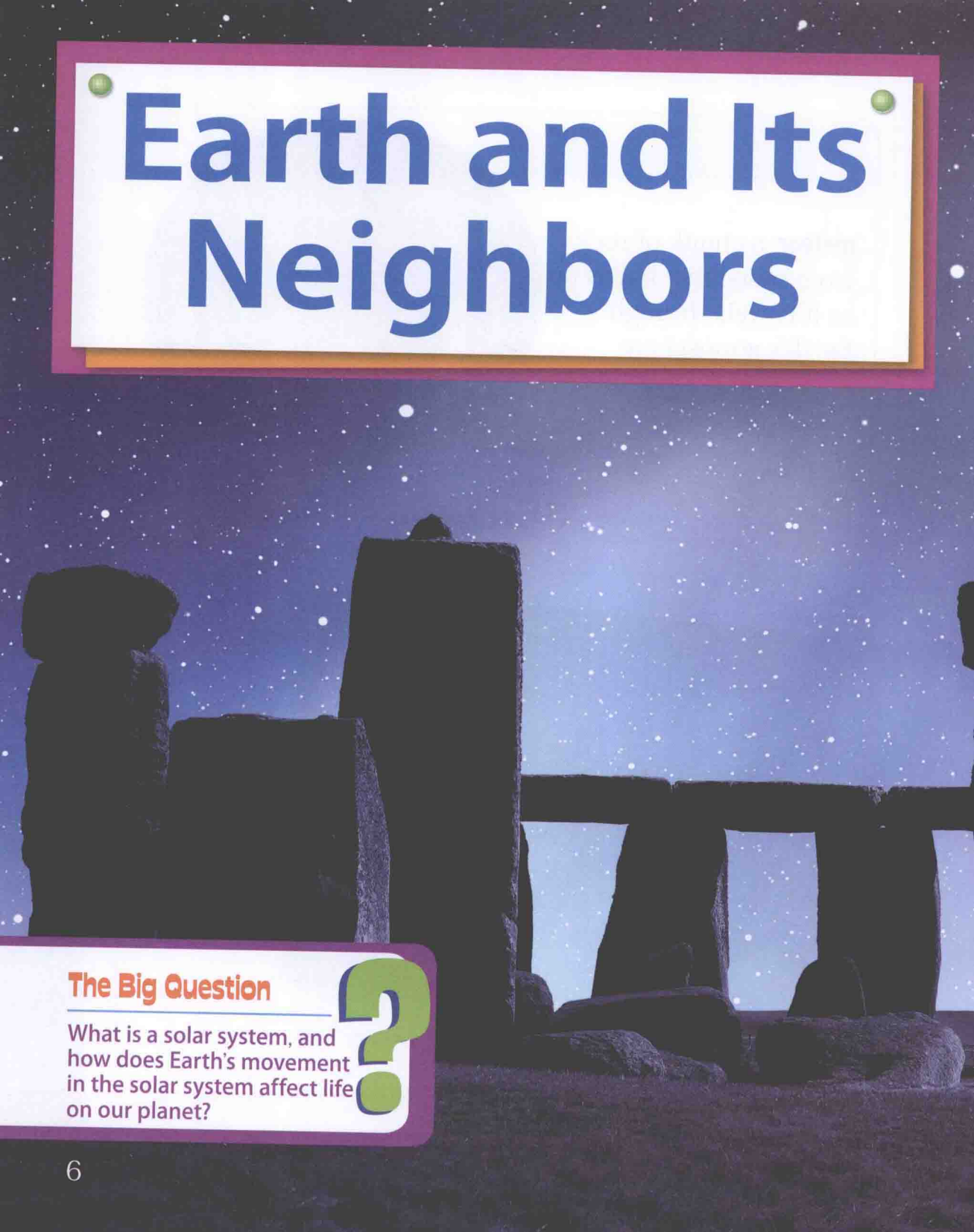
Sometimes you can see **meteors** move through Earth's atmosphere.

solar system the sun and the objects that orbit it



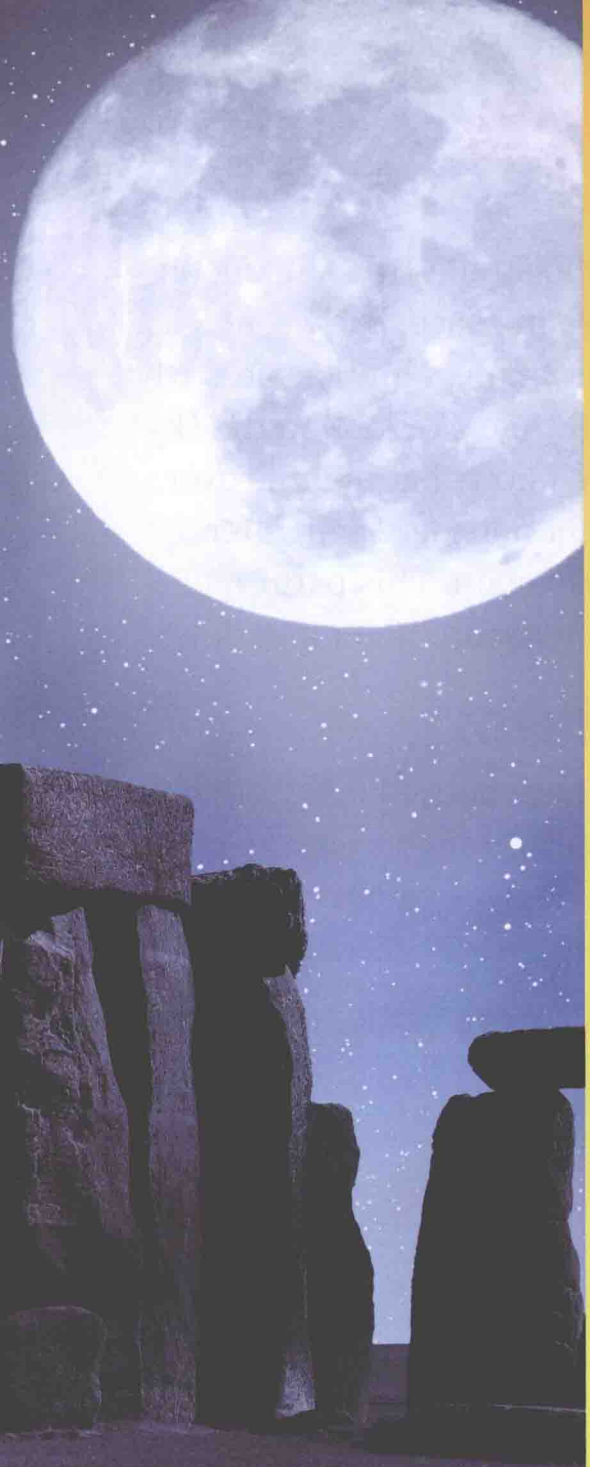
The **solar system** contains eight planets. *Can you name them?*

Earth and Its Neighbors



The Big Question

What is a solar system, and how does Earth's movement in the solar system affect life on our planet?



Early Astronomers

Imagine that you are living 7,000 years ago. There are no grocery stores. To eat, you and your family hunt and grow crops. This is hard work! Most crops do not grow year-round and many animals can be found only during certain seasons. Because of this, it is very important to know what time of the year it is. But there are no calendars, newspapers, or clocks to help you. What would you do? You would rely on the night sky and the changes in your environment in order to know what to do. That is just what farmers and hunters did. Scientists think that farmers and hunters might have been our earliest astronomers.

Stone circles, such as Stonehenge in England, were built thousands of years ago. Scientists think the stones may have been used for religious ceremonies, to track changes in the sky, or to keep track of time.

SECTION 1

Astronomers Make Discoveries

An **astronomer** is a scientist who studies the sun, moon, stars, planets, and other bodies in space. Early astronomers may have been ancient hunters and farmers who looked to the skies to help them tell time. We look to the sky to tell time as well. For example, we know that night is over when the sun rises and it grows light outside. Then, after time, the sun sets, and it grows dark again. This pattern of light and dark over time is how we measure night and day.

Astronomers Noticed Patterns

Throughout history, astronomers have noticed many other patterns. They saw that the moon goes through a pattern of phases in the sky over a period of time. This pattern became how months are measured. Some early astronomers also measured years by the pattern of the seasons on Earth. We are like early astronomers because we measure time by keeping track of patterns. But now we have a better understanding about why these patterns happen.

Astronomers Noticed Patterns

Unit of Time	Early Observation
Day	a pattern of change from light to dark and dark to light in the sky
Month	the moon goes through a pattern of phases over time
Year	the seasons change in a pattern

What Causes Night and Day?

Early astronomers knew that night and day happened over a period of time. Today we measure time in hours. We know that a day is 24 hours long. We also know why day and night happen. We know that night and day happen because Earth spins on an invisible axis. An **axis** is a real or imaginary line through the center of a spinning object.

This globe shows Earth's axis.

✓ Comprehension

Summarize why a full day lasts 24 hours.

When one half of Earth turns toward the sun, it becomes daytime for that half. At the same time, the other half of Earth turns away from the sun and it is nighttime for that half. Because it takes Earth 24 hours to turn one time on its axis, one full day on Earth is 24 hours long.

Like this top, Earth spins on an axis.