

Water on Earth

If YOU lived there...

You live in the desert Southwest, where heavy water use and a lack of rainfall have led to water shortages. Your city plans to begin a water conservation program that asks people to limit how much water they use. Many of your neighbors have complained that the program is unnecessary. Others support the plan to save water.

How do you feel about the city's water plan?

What You Will Learn...

Main Ideas

1. Salt water and freshwater make up Earth's water supply.
2. In the water cycle, water circulates from Earth's surface to the atmosphere and back again.
3. Water plays an important role in people's lives.

The Big Idea

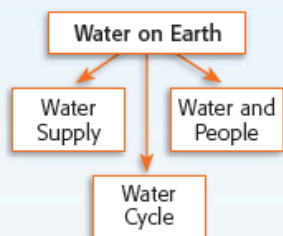
Water is a dominant feature on Earth's surface and is essential for life.

Key Terms

freshwater, p. 31
glaciers, p. 31
surface water, p. 31
precipitation, p. 31
groundwater, p. 32
water vapor, p. 32
water cycle, p. 33

TAKING NOTES

As you read, take notes about Earth's water, the water cycle, and how water affects our lives. Use a diagram like the one below to organize your notes.



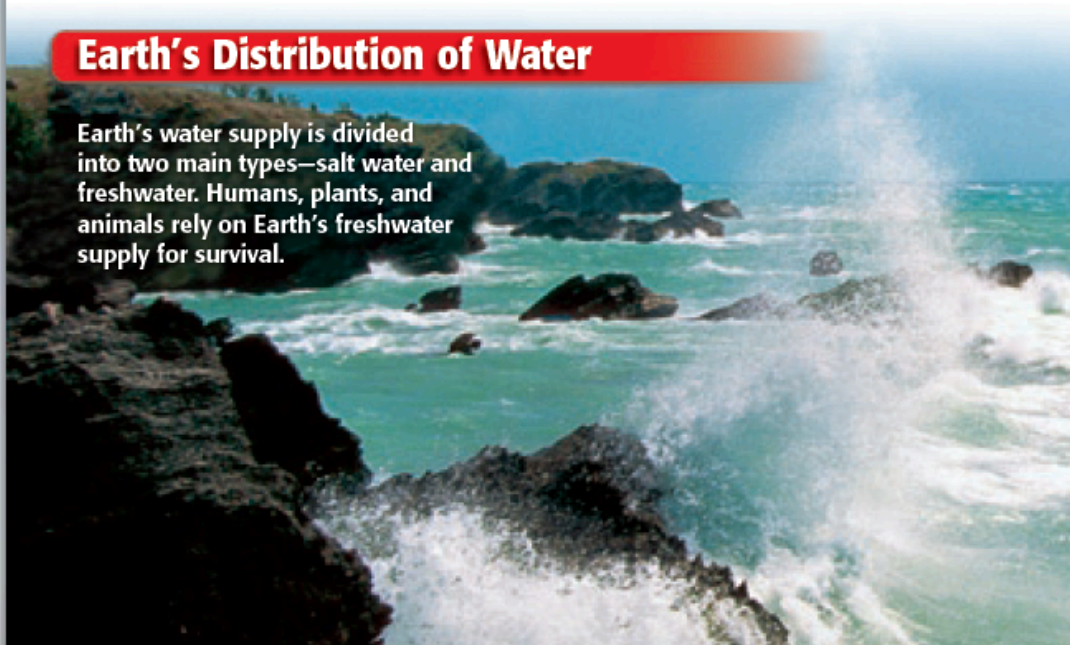
BUILDING BACKGROUND Although water covers much of Earth's surface, water shortages, like those in the American Southwest, are common all over the planet. Because water is vital to the survival of all living things, geographers study Earth's water supply.

Earth's Water Supply

Think of the different uses for water. We use water to cook and clean, we drink it, and we grow crops with it. Water is used for recreation, to generate electricity, and even to travel from place to place. Water is perhaps the most important and abundant resource on Earth. In fact, water covers some two-thirds of the planet. Understanding Earth's water supply and how it affects our lives is an important part of geography.

Earth's Distribution of Water

Earth's water supply is divided into two main types—salt water and freshwater. Humans, plants, and animals rely on Earth's freshwater supply for survival.



Salt Water

Although water covers much of the planet, we cannot use most of it. About 97 percent of the Earth's water is salt water. Because salt water contains high levels of salt and other minerals, it is unsafe to drink.

In general, salt water is found in Earth's oceans. Oceans are vast bodies of water covering some 71 percent of the planet's surface. Earth's oceans are made up of smaller bodies of water such as seas, gulfs, bays, and straits. Altogether, Earth's oceans cover some 139 million square miles (360 million square km) of the planet's surface.

Some of Earth's lakes contain salt water. The Great Salt Lake in Utah, for example, is a saltwater lake. As salt and other minerals have collected in the lake, which has no outlet, the water has become salty.

Freshwater

Since the water in Earth's oceans is too salty to use, we must rely on other sources for freshwater. **Freshwater, or water without salt**, makes up only about 3 percent of our total water supply. Much of that freshwater is locked in Earth's **glaciers, large areas of slow moving ice**, and in the ice of the Antarctic and Arctic regions. Most of the freshwater we use everyday is found in lakes, rivers, and under Earth's surface.

One form of freshwater is surface water. **Surface water is water that is found in Earth's streams, rivers, and lakes**. It may seem that there is a great deal of water in our lakes and rivers, but only a tiny amount of Earth's water supply—less than 1 percent—comes from surface water.

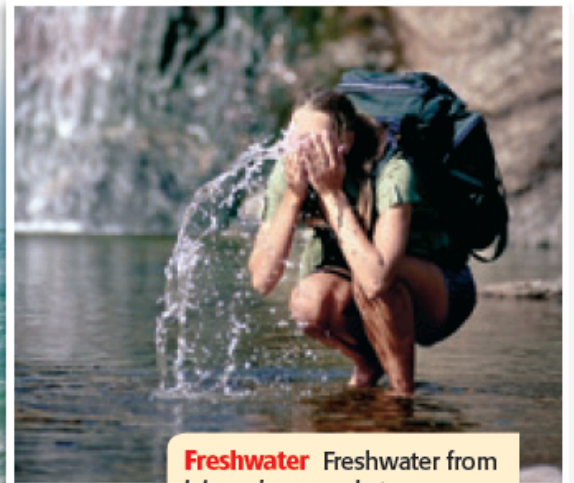
Streams and rivers are a common source of surface water. Streams form when precipitation collects in a narrow channel and flows toward the ocean. **Precipitation is water that falls to Earth's surface as rain, snow, sleet, or hail**. In turn, streams join together to form rivers. Any smaller stream or river that flows into a larger stream or river is called a tributary. For example, the Missouri River is the largest tributary of the Mississippi River.

Lakes are another important source of surface water. Some lakes were formed as rivers filled low-lying areas with water. Other lakes, like the Great Lakes along the U.S.–Canada border, were formed when glaciers carved deep holes in Earth's surface and deposited water as they melted.

Most of Earth's available freshwater is stored underground. As precipitation falls to Earth, much of it is absorbed into the ground, filling spaces in the soil and rock.



Salt Water Earth's oceans contain some 97 percent of the planet's water supply. Unfortunately, this water is too salty to drink.



Freshwater Freshwater from lakes, rivers, and streams makes up only a fraction of Earth's water supply.

Water found below Earth's surface is called **groundwater**. In some places on Earth, groundwater naturally bubbles from the ground as a spring. More often, however, people obtain groundwater by digging wells, or deep holes dug into the ground to reach the water.

READING CHECK **Contrasting** How is salt water different from freshwater?

Interactive
Close-up

The Water Cycle

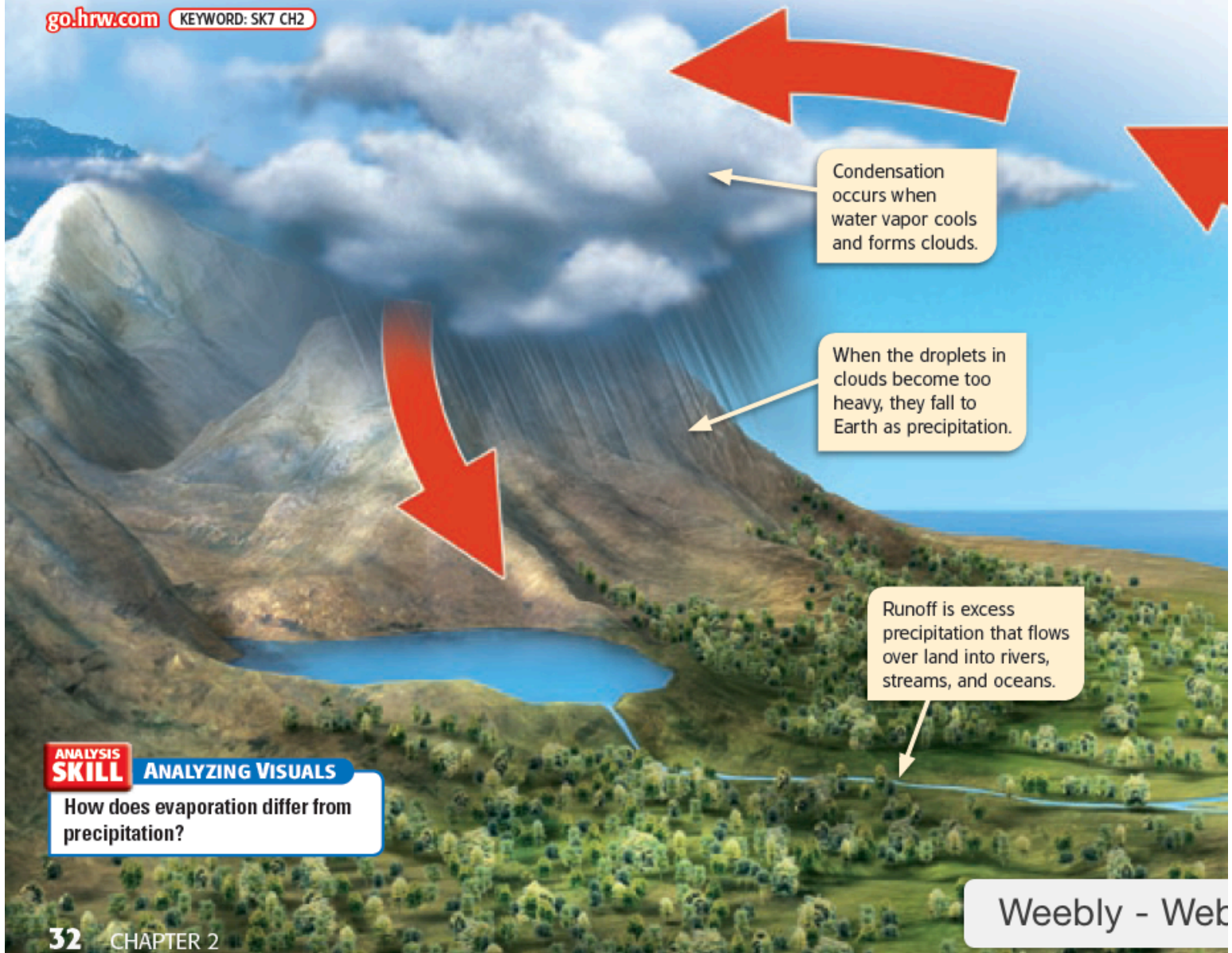
Energy from the sun drives the water cycle. Surface water evaporates into Earth's atmosphere, where it condenses, then falls back to Earth as precipitation. This cycle repeats continuously, providing us with a fairly constant water supply.

go.hrw.com KEYWORD: SK7 CH2

The Water Cycle

When you think of water, you probably visualize a liquid—a flowing stream, a glass of ice-cold water, or a wave hitting the beach. But did you know that water is the only substance on Earth that occurs naturally as a solid, a liquid, and a gas? We see water as a solid in snow and ice and as a liquid in oceans and rivers. **Water also occurs in the air as an invisible gas called water vapor.**

Water is always moving. As water heats up and cools down, it moves from the planet's surface to the atmosphere, or the mass of air that surrounds Earth. One of the most important processes in nature



ANALYSIS SKILL ANALYZING VISUALS


How does evaporation differ from precipitation?

is the water cycle. The **water cycle** is the movement of water from Earth's surface to the atmosphere and back.

The sun's energy drives the water cycle. As the sun heats water on Earth's surface, some of that water evaporates, or turns from liquid to gas, or water vapor. Water vapor then rises into the air. As the vapor rises, it cools. The cooling causes the water vapor to condense, or change from a vapor into tiny liquid droplets. These droplets join together to form clouds. If the droplets become heavy enough, precipitation occurs—that is, the water falls back to Earth as rain, snow, sleet, or hail.

When that precipitation falls back to Earth's surface, some of the water is absorbed into the soil as groundwater. Excess water, called runoff, flows over land and collects in streams, rivers, and oceans. Because the water cycle is constantly repeating, it allows us to maintain a fairly constant supply of water on Earth.

READING CHECK Finding Main Ideas What is the water cycle?



As energy from the sun heats water on Earth's surface, the water evaporates, or turns to water vapor, and rises to the atmosphere.

Water and People

How many times a day do you think about water? Many of us rarely give it a second thought, yet water is crucial for survival. Water problems such as the lack of water, polluted water, and flooding are concerns for people all around the world. Water also provides us with countless benefits, such as energy and recreation.

Water Problems

One of the greatest water problems people face is a lack of available freshwater. Many places face water shortages as a result of droughts, or long periods of lower-than-normal precipitation. Another cause of water shortages is overuse. In places like the southwestern United States, where the population has grown rapidly, the heavy demand for water has led to shortages.

Even where water is plentiful, it may not be clean enough to use. If chemicals and household wastes make their way into streams and rivers, they can contaminate the water supply. Polluted water can carry diseases. These diseases may harm humans, plants, and animals.

Flooding is another water problem that affects people around the world. Heavy rains often lead to flooding, which can damage property and threaten lives. One example of dangerous flooding occurred in Bangladesh in 2004. Floods there destroyed roads and schools and left some 25 million people homeless.

Water's Benefits

Water does more than just quench our thirst. It provides us with many benefits, such as food, power, and even recreation.

Water's most important benefit is that it provides us with food to eat. Everything we eat depends on water. For example, fruits and vegetables need water to grow.

FOCUS ON READING

Look at the word *countless* in this paragraph. The suffix *-less* means unable to. What does *countless* mean?



The Benefits of Water

Many people take advantage of the recreational and agricultural benefits that water provides.



Animals also need water to live and grow. As a result, we use water to farm and raise animals so that we will have food to eat.

Water is also an important source of energy. Using dams, we harness the power of moving water to produce electricity. Electricity provides power to air-condition or heat our homes, to run our washers and dryers, and to keep our food cold.

Water also provides us with recreation. Rivers, lakes, and oceans make it possible for us to swim, to fish, to surf, or to sail a

boat. Although recreation is not critical for our survival, it does make our lives richer and more enjoyable.

READING CHECK Summarizing How does water affect people's lives?

SUMMARY AND PREVIEW In this section you learned that water is essential for life on Earth. Next, you will learn about the shapes on Earth's surface.

Section 2 Assessment

Reviewing Ideas, Terms, and Places

- a. Describe** Name and describe the different types of water that make up Earth's water supply.

b. Analyze Why is only a small percentage of Earth's **freshwater** available to us?

c. Elaborate In your opinion, which is more important—**surface water** or **groundwater**? Why?
- a. Recall** What drives the **water cycle**?

b. Make Inferences From what bodies of water do you think most evaporation occurs? Why?
- a. Define** What is a drought?

b. Analyze How does water support life on Earth?

c. Evaluate What water problem do you think is most critical in your community? Why?

Critical Thinking

- Sequencing** Draw the graphic organizer at right. Then use your notes and the graphic organizer to identify the stages in Earth's water cycle.

FOCUS ON WRITING

- Learning about Water** Consider what you have learned about water in this section. How might you describe water in your haiku? What words might you use to describe Earth's water supply?

go.hrw.com

Online Quiz

KEYWORD: SK7 HP2

Heat from the sun evaporates water on Earth.

The water cycle repeats.