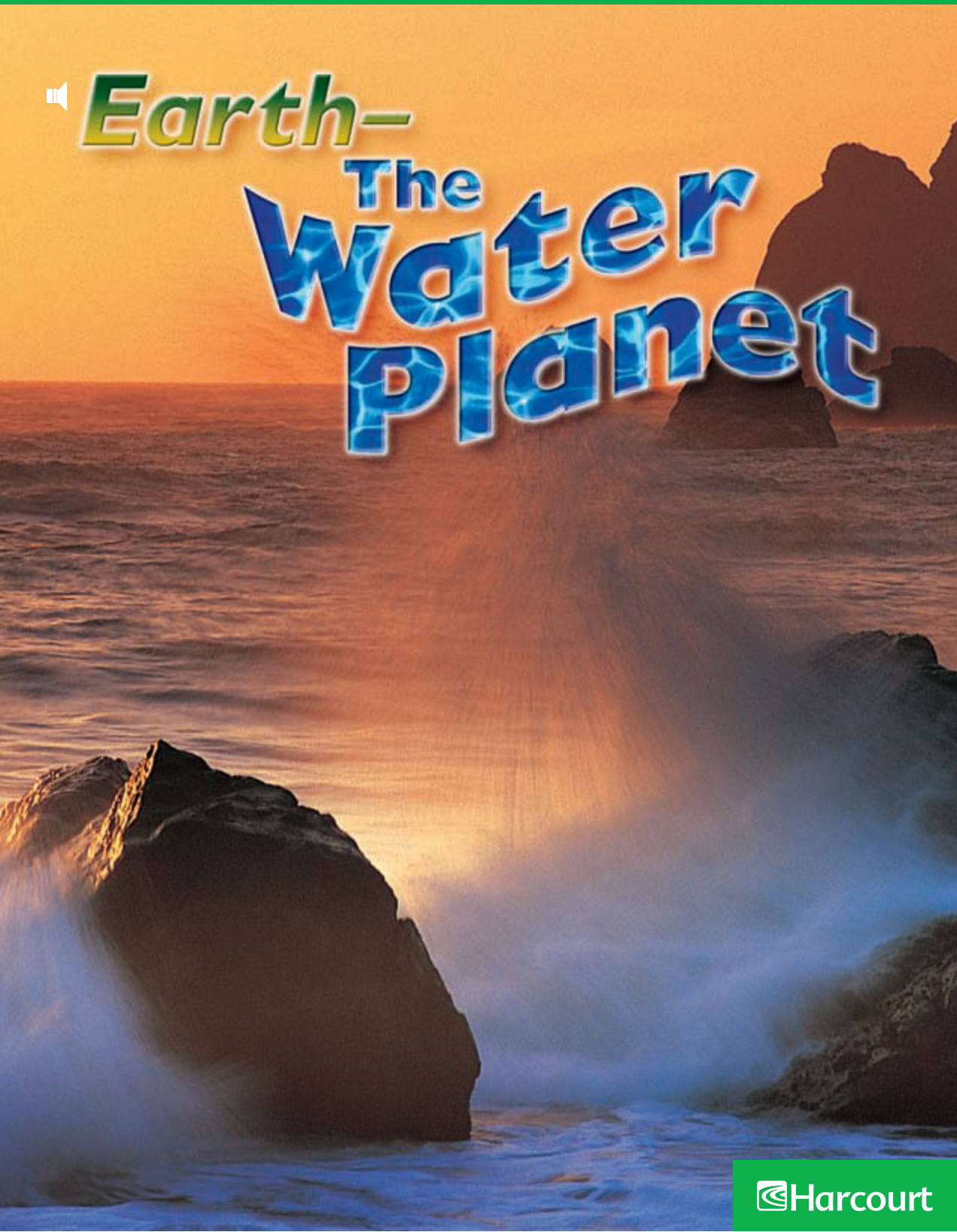
Earth– The Water Planet



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by Mary Dylewski

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Printed in the United States of America

ISBN 978-0-15-362436-0
ISBN 0-15-362436-1

1 2 3 4 5 6 7 8 9 10 175 16 15 14 13 12 11 10 09 08 07

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The Stoop

Even though the air was cool, Sarah felt hot while she was raking the leaves. She reached for the cup of water that perched on the stoop's railing and took a sip. She would use the rest of the water to water the ivy plant in her room—if she could remember to bring the cup inside.

Two days later, Sarah stood on the stoop and spotted her abandoned cup of water—or rather just cup. The cup was empty. The water had evaporated.

Sarah bent to pick up the cup, but a clap of thunder made her jump back. Raindrops tickled her nose and splattered at her feet. She dashed inside without the cup.

From her window, Sarah watched as rain began to fill the cup. She promised herself that she'd bring in the cup as soon as the weather cleared. Her ivy would get a drink of rainwater.

The next morning, Sarah cringed at the chilly air as she stepped onto the stoop on her way to school. She didn't notice her neglected cup until she hit it with her lunch bag. The cup rolled down the steps and spun on the sidewalk. No water spilled.

Sarah picked up the cup. Inside was the season's first ice! The ice glistened like a jewel.

Sarah decided to take the ice to school. It would be the perfect prop for today's lesson on water. Tonight she would remember to water her ivy.

The Water Cycle

Earth is often called "the water planet." Nearly three-fourths of it is covered with water. If all of this water formed a single drop, it would be a sphere about 1350 kilometers (840 mi) across!

Not all of the water on Earth is liquid. As Sarah observed, water can be a solid called ice. It can also evaporate to become a gas called water vapor.

Water vapor comes from oceans, rivers, and lakes. It even comes from plants. When Sarah waters her ivy, water travels through the plant and evaporates from its leaves.

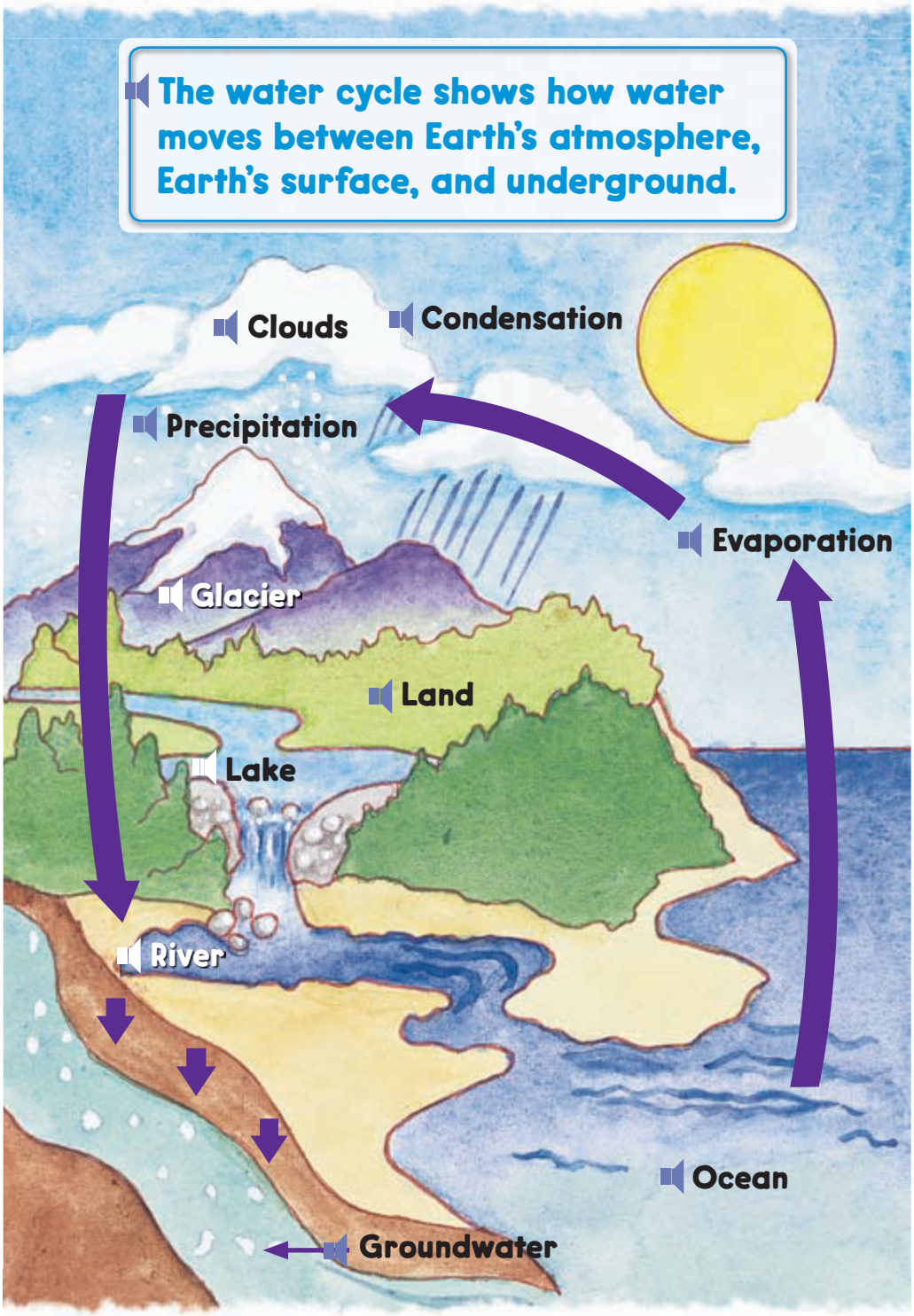
Water moves constantly among the air, Earth's surface, the oceans, and underground. This movement of water is called the water cycle.

Liquid water evaporates and enters the air. When the water vapor cools, it condenses, or changes to a liquid.

Condensation of water vapor in the atmosphere causes clouds to form. Water that falls from these clouds is called precipitation. Evaporation, condensation, and precipitation are processes that help move water to different places on Earth.

Groundwater

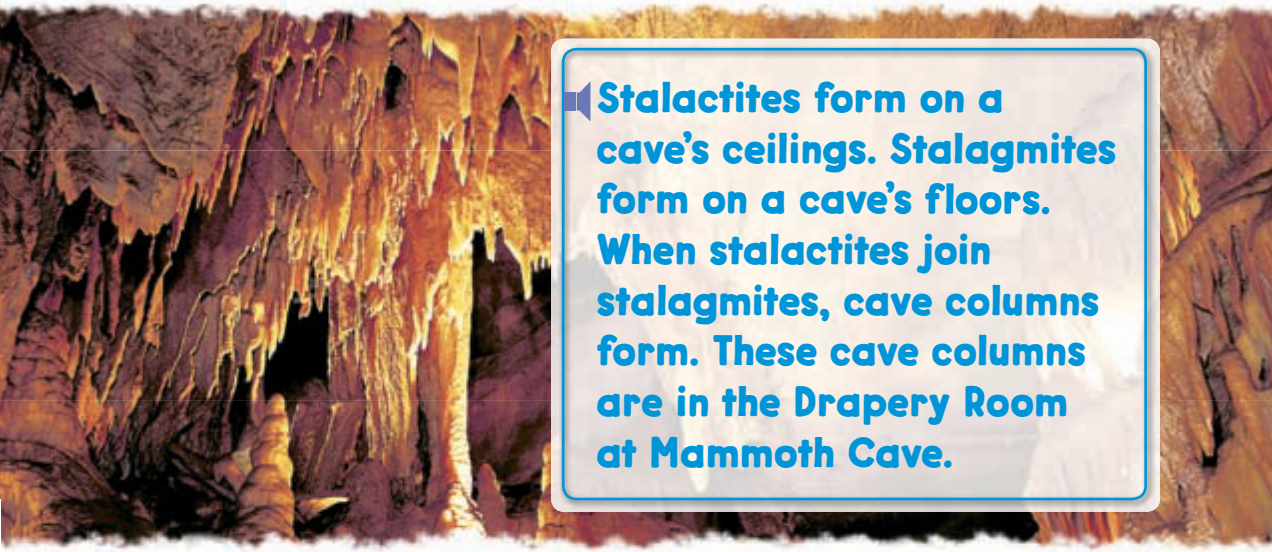
When water falls onto Earth's surface as precipitation, some of it runs along the surface. Some of it sinks, or seeps, into the ground. The liquid water stored beneath Earth's surface is called groundwater.


The water cycle shows how water moves between Earth's atmosphere, Earth's surface, and underground.
Clouds
Condensation
Precipitation
Evaporation
Glacier
Land
Lake
River
Ocean
Groundwater

The ground beneath you may seem solid. However, in most places there are spaces in soil and rocks. These spaces trap much of Earth's groundwater. In some places, groundwater can form small ponds and streams below the surface.

Groundwater can change the land beneath Earth's surface. Mammoth Cave National Park is a good example. This park has hundreds of miles of caves and tunnels that began to form millions of years ago as groundwater slowly dissolved the rocks. Today, groundwater moving beneath Earth's surface continues to make new passageways in the rocks.

Groundwater can carry tiny bits of dissolved rock. If water drips from the ceiling of a cave, the bits of dissolved rock may come out of the water and form crystals. Some of these crystals form long, thin structures that hang from a cave's ceiling. They are called stalactites. Hollow stalactites are called soda straws. Can you guess why?



Stalactites form on a cave's ceilings. Stalagmites form on a cave's floors. When stalactites join stalagmites, cave columns form. These cave columns are in the Drapery Room at Mammoth Cave.

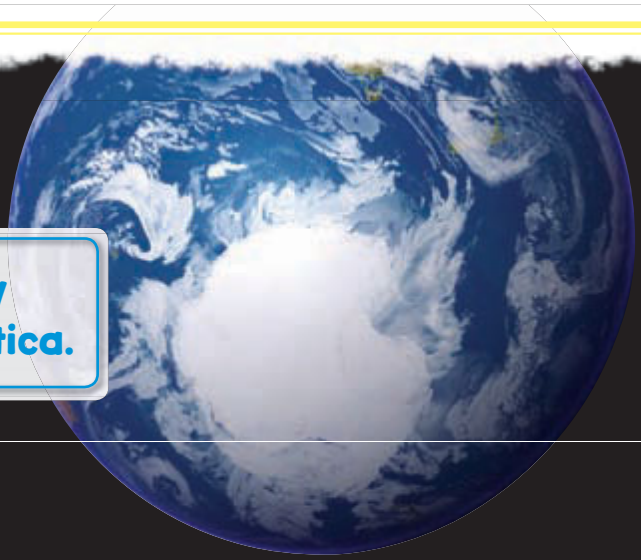
Groundwater dripping from a cave's ceiling to the floor can deposit bits of dissolved rock on the cave's floor. This material grows upward from the floor. It forms a feature called a stalagmite. Stalagmites are much thicker than stalactites.

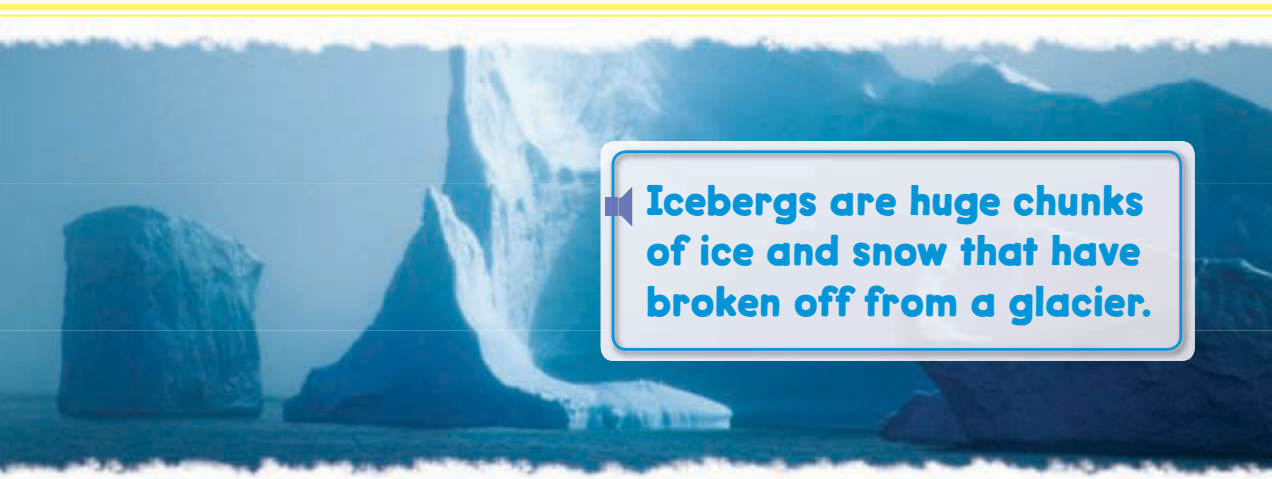
Sometimes, a growing stalactite meets a forming stalagmite. These two structures can join to form a feature called a cave column. The Drapery Room at Mammoth Cave has many cave columns. They look like the folds in heavy curtains.

Glaciers

Glaciers play a major role in the water cycle. Glaciers are large masses of ice and snow. Glaciers form when more snow falls than melts. As new snow falls, it presses against the layers of older snow under it. This pressure changes some of the snow to ice.

Glaciers cover nearly 98 percent of Antarctica.





Icebergs are huge chunks of ice and snow that have broken off from a glacier.

Glaciers can form at high points on Earth, such as at the tops of tall mountains. These types of glaciers are called mountain glaciers. They move slowly downhill.

Glaciers can also form at places near Earth's poles. The glaciers that form at the poles are the largest type of glaciers. They are called ice sheets. Today, ice sheets cover much of Greenland and Antarctica.

Glaciers are important because they store fresh water in solid form. When glaciers melt, they release liquid water. Scientists hypothesize that if all of Earth's glaciers melted today, the level of Earth's oceans would rise by about 70 meters (230 ft)!

Large chunks of ice can break away from ice sheets into the ocean. These chunks of ice are called icebergs. Some icebergs are as big as houses, and some are even larger. In fact, one iceberg measured about 11,000 square kilometers (4,200 sq mi)! Ocean water can carry icebergs to warmer places. Eventually, icebergs melt into liquid water.

Lakes

A lake is a large body of standing or slow-moving water. Most lakes contain fresh water. A few lakes have salt water.

Lakes form in different ways. Moving glaciers carve out deep bowl shapes in the land. Then the glaciers melt. The fresh water from the glaciers fills the bowls to form lakes.

Sometimes rocks and mud block a stream or river. These materials keep the water from flowing forward. The water then collects to form a lake.

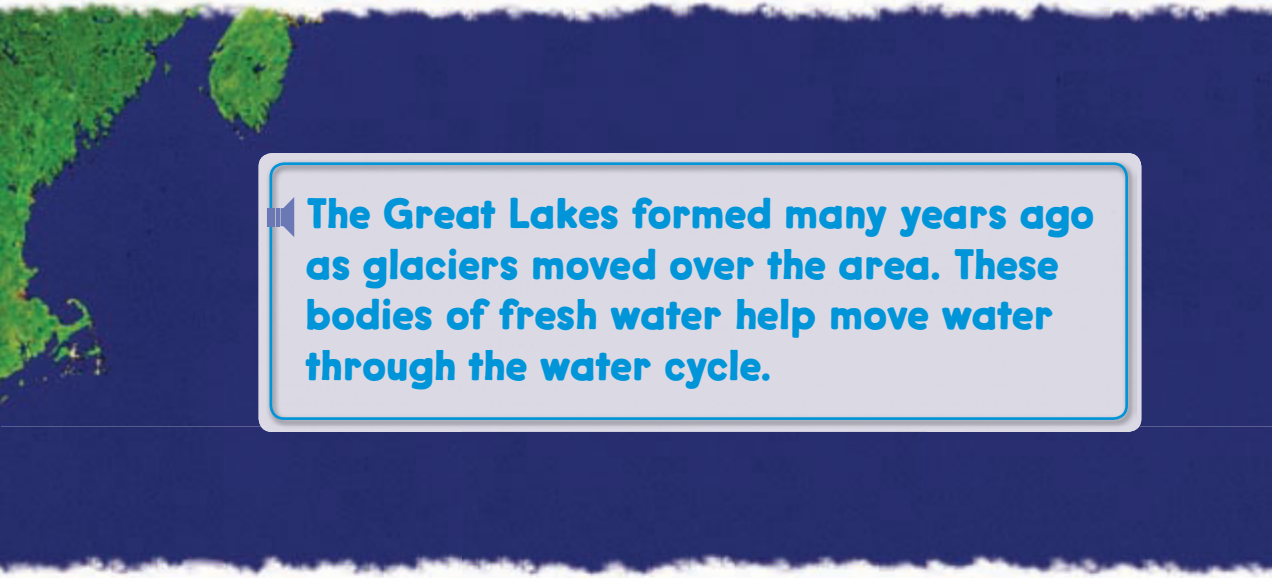
Some lakes form when water dissolves a rock called limestone. Water flows around the limestone. The limestone dissolves, forming a feature called a sinkhole. When water fills the sinkhole, a lake forms.

Like glaciers, lakes help move water through the water cycle. Lakes get water from precipitation. Streams and rivers

can empty water into lakes. Lakes can get water when groundwater reaches the surface.

Water leaves a lake through evaporation. Streams and rivers also allow water to leave. Water can seep out of lakes and become groundwater.

The Great Lakes are good examples of the role lakes play in the water cycle. In winter, the lakes are at their lowest levels. This is because much of the precipitation that falls over the area is solid. The solid ice and snow stay on the land instead of running off into the lakes as rainwater would. Also, cold, dry air causes water near the top of the lakes to evaporate. In spring, the water in the Great Lakes is usually at its highest levels. In the spring, melting winter snow adds large amounts of water to the Great Lakes.



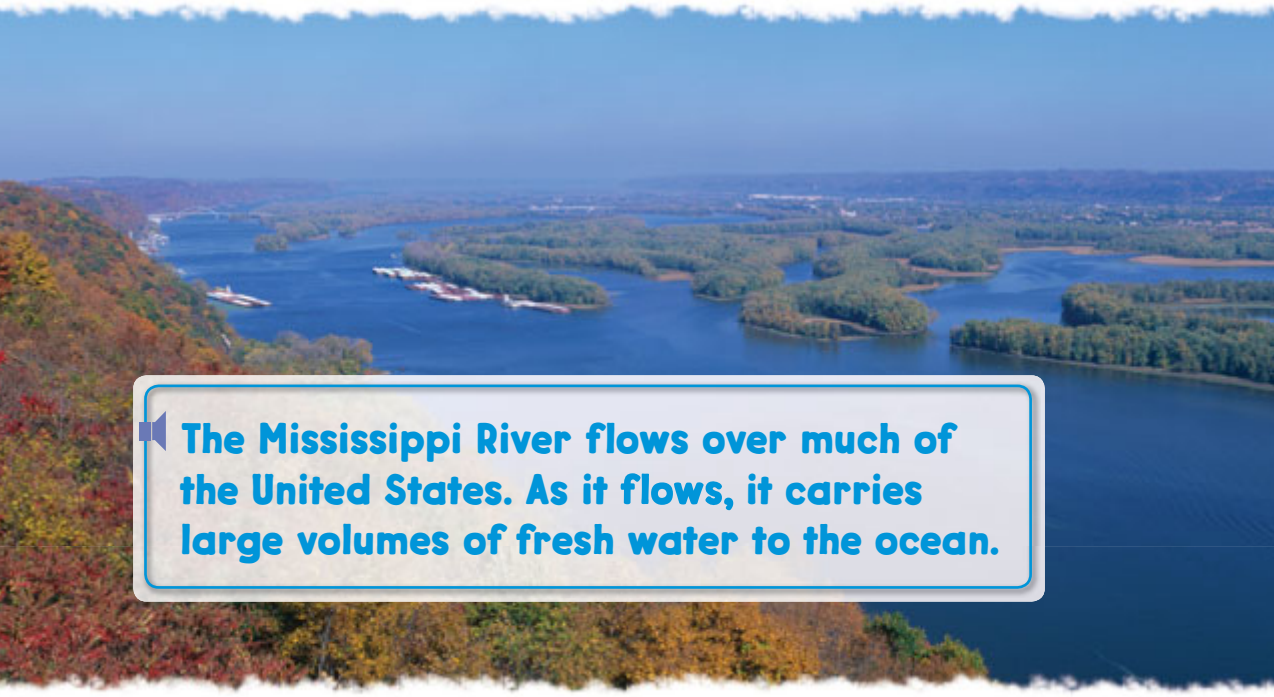
The Great Lakes formed many years ago as glaciers moved over the area. These bodies of fresh water help move water through the water cycle.

Rivers

A river is a body of flowing fresh water. It flows over land from a higher point to a lower point. Rivers often begin on a mountain or hilltop.

Water can enter a river in several ways. Rainwater and melted snow may enter a river. Groundwater that has come to the surface can also add to a river. Water can run off the land into a river. All rivers eventually flow into the ocean.

Some rivers are only a few kilometers long. Others flow over large areas. The Mississippi River is the third-longest river system on Earth. The Mississippi is about 3,700 kilometers (2,299 mi) long. It carries fresh water from the land to the ocean.



The Mississippi River flows over much of the United States. As it flows, it carries large volumes of fresh water to the ocean.

The Oceans

Earth's oceans are salty bodies of water. They cover nearly three-fourths of the planet and play a large role in Earth's water cycle. The oceans are Earth's largest water storage site. They store about 97 percent of Earth's water!

The rate of evaporation over the oceans is greater than the amount of precipitation that enters the ocean. So why don't the oceans run out of water? Lost water is replaced by water flowing into the oceans. Some of it comes as water runs off the land. Water also enters the oceans as glaciers and icebergs melt.

Plants

Another place we can look for water is in a forest. A forest is full of plants. You may not think of plants when you hear the words *water cycle.* But Earth's millions of plants play an important role in the water cycle.

Plants take in water through their roots. This water travels through the plant. Some of it passes through small openings on a plant's leaves and evaporates into the atmosphere. About 10 percent of all of the water vapor in the air is the result of this transpiration.

From underground to a forest full of plants, water cycle processes are occurring everywhere—even on Sarah's stoop. The next time you are outside, take a look around. You will be able to see water moving all around you!

Plants move water from the ground to the air through the process of transpiration.

Think and Respond

1. What happens during condensation?
2. Describe the role of glaciers in the water cycle.
3. **Expository Writing** Write a short paragraph that explains the role of plants in the water cycle.

Hands-On Activity

Plants and the Water Cycle Show how plants are part of the water cycle. Place a clear, thin plastic bag over a leaf of a houseplant. Fasten the bag to the stem with a piece of thread. Wait a few hours. Describe what you see on the inside of the bag. Explain your results.

School-Home Connection

Words to Remember Some people use a trick to remember the difference between stalactite and stalagmite. In *stalactite, tite* sounds like *tight* as in "Hold on tight!" Like a stalactite, you would have to "hold on tight" if you were hanging from a cave ceiling! With a family member, look for at least one new word in this book. Think of a way to remember its meaning.

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ISBN 978-0-15-362436-0
ISBN 0-15-362436-1

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