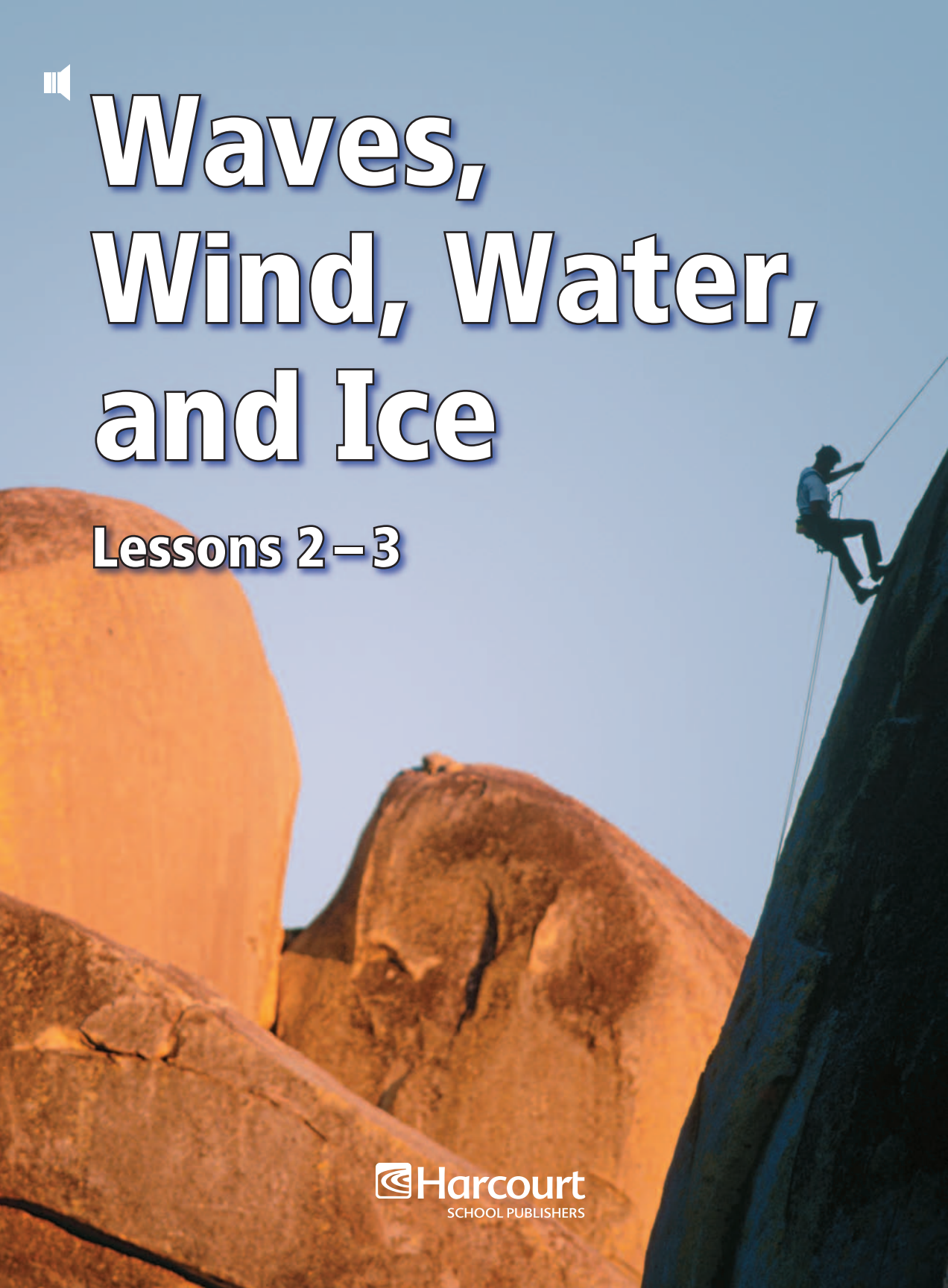
Waves, Wind, Water, and Ice

Lessons 2–3



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Lesson 2

What Causes Weathering?

VOCABULARY

- weathering
- soil
- mechanical weathering
- chemical weathering

Weathering breaks down rock. It can create holes in rocks.

Weathering helps create **soil**. Soil is a mixture of weathered rock, bits of dead things, water, and air.

Wind and weather break down rock by **mechanical weathering**.

Water breaks down rock by **chemical weathering**.

Focus Skill

READING FOCUS SKILL

CAUSE AND EFFECT

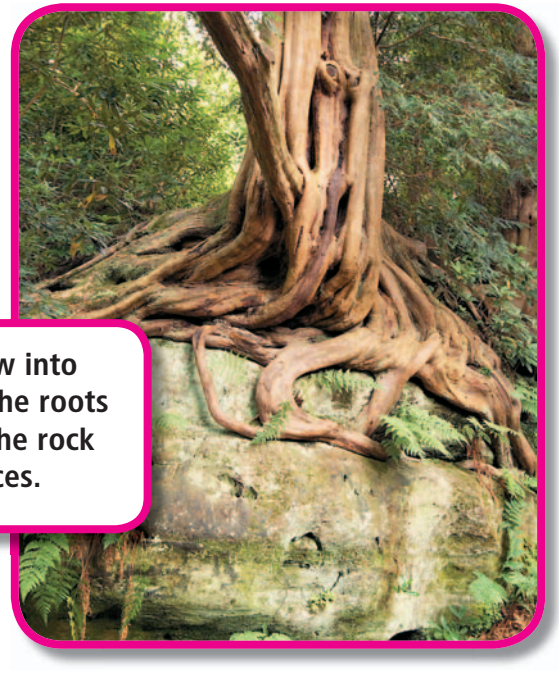
A **cause** is something that makes another thing happen. An **effect** is the thing that happens.

Look for examples of **cause** and **effect**. Look for causes of weathering.

Mechanical Weathering

Weathering is part of the rock cycle. Rocks break down into smaller pieces, called sediment. **Soil** is a mixture of weathered rock, the remains of dead organisms, water, and air.

Mechanical weathering breaks rock into smaller pieces. Ice, water, wind, and temperature changes all weather rock.

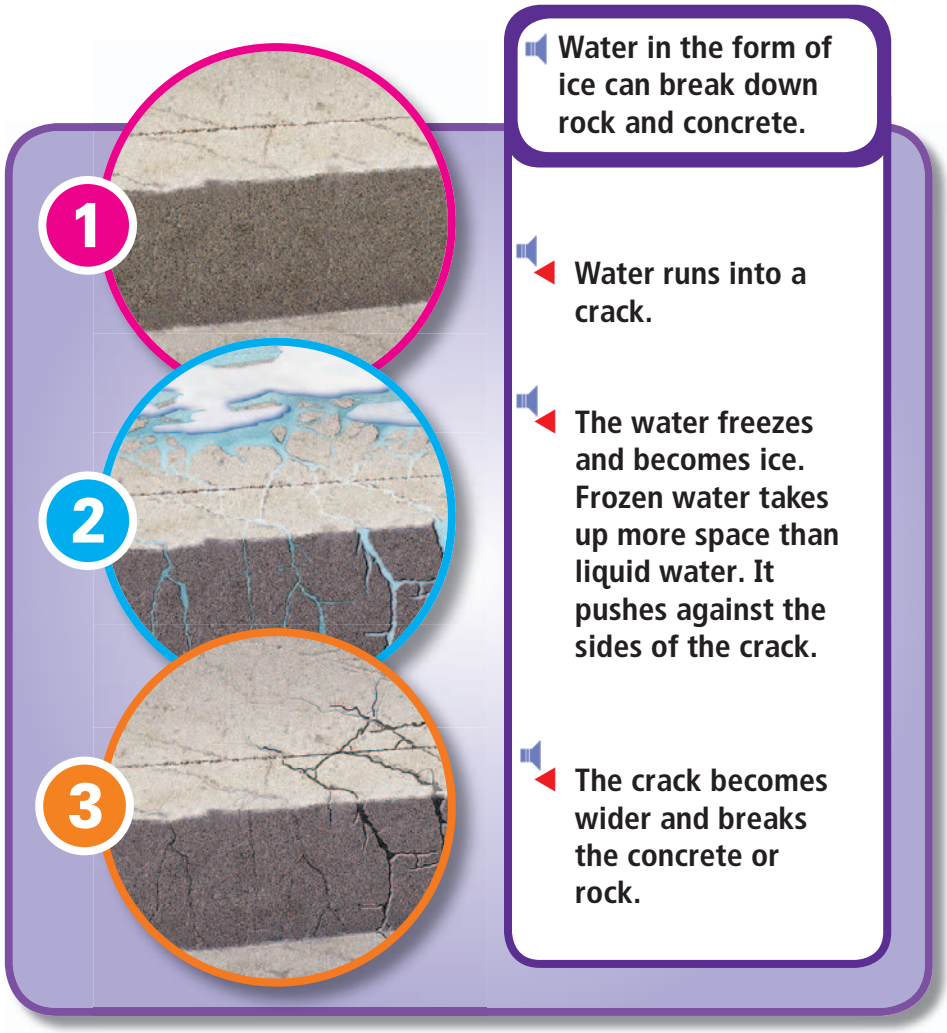


Roots often grow into cracks in rock. The roots grow and split the rock into smaller pieces.

Water runs into cracks in rocks and freezes. Water expands as it freezes. The crack gets wider. The water thaws. This happens again and again. Over time, the rock can break apart.

Rocks get a little bigger when heated. They get a little smaller when cooled. Repeated heating and cooling weakens some rocks. When the rocks are weakened they crack or break.

Focus Skill What can cause mechanical weathering?

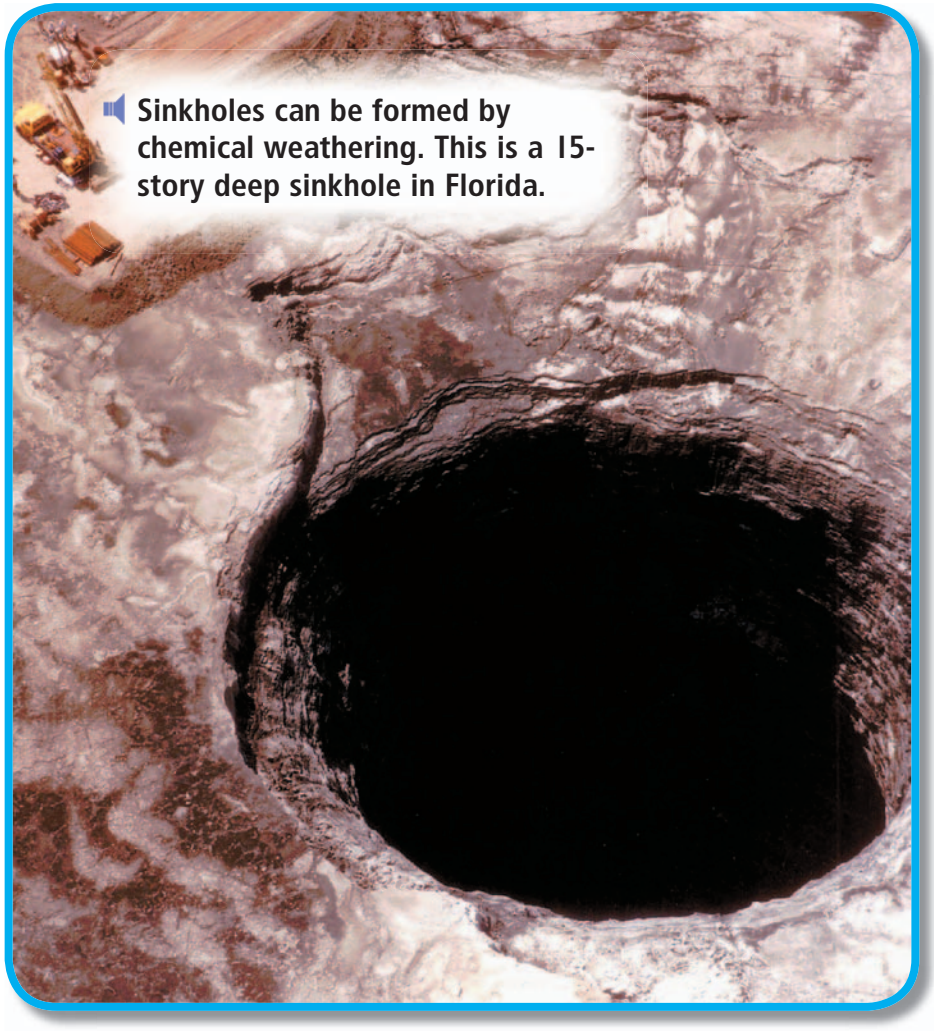


Chemical Weathering

Water breaks down rock by **chemical weathering**. Water and gases in the air cause most chemical weathering. Water, oxygen, and pollution can mix with minerals in the rock. This changes the chemical makeup of the rock. The rock breaks down.

Focus Skill **What causes most chemical weathering?**

Some minerals contain iron. Oxygen in the air can combine with this iron. This creates rust on the outer layer of the rock.



Sinkholes can be formed by chemical weathering. This is a 15-story deep sinkhole in Florida.

Review

Focus Skill

Complete these cause and effect statements.

1. Changes in temperature can cause _____ .
2. Freezing causes water to _____ .
3. Cold causes rocks to get _____ .
4. Water and gases in the air cause most _____ _____ .

Lesson 3

How Does Moving Water Shape the Land?

VOCABULARY

- erosion
- transport
- runoff
- deposition

Erosion formed this gully. The dirt and sediment were washed away.

These sandbars were made by **transport**. Sediment is *transported* from place to place by water.

Runoff is water that flows over the land without sinking in.

This delta was formed by **deposition**. The river drops off sediment as it slows down.

READING FOCUS SKILL
MAIN IDEA AND DETAILS

The **main idea** is what the text is mostly about. **Details** are pieces of information about the main idea. Look for examples of change in Earth surface and **details** of how change happens.

Rivers Shape the Land

Erosion moves sediment from one place to another. This changes Earth's surface.

Rivers erode landforms and change them. Rivers contain **runoff**. Runoff is water that flows over land without sinking in. Runoff transports or moves sediment to rivers.

As rivers slow down they drop sediment. This is called **deposition**. Deposition forms landforms such as deltas at the mouths of rivers. Deposition also leaves sediment inside curves along the river banks.

How are deltas formed?

A river slows down when it enters a lake or an ocean. It can then carry less sediment. The river drops most of the sediment to form a delta.

Ocean Waves Shape the Land

Waves are another cause of weathering and erosion. Large ocean waves pound the coastlines. Over time, the pounding breaks the rock into pieces.

Deposition on coasts forms beaches. Waves and ocean currents pick up sediment from weathered cliffs. Rivers also drop sediment into the sea. The ocean deposits sediment from all these sources on the shore. The deposition becomes beach sand.

Focus Skill **What is the source of beach sand?**

Waves hitting cliffs are a cause of weathering.

Review

Focus Skill

Complete this main idea statement.

1. Moving _____ shapes the land.

Complete these detail statements.

2. _____ is water that transports or moves sediment to rivers.

3. Deposition forms landforms such as _____ .

4. Rivers drop _____ into the sea.

GLOSSARY

chemical weathering [KEM•ih•kuhl WETH•er•ing] A process by which the chemical makeup of a rock is changed.

deposition [deh•puh•ZIH•shuhn] The dropping of sediment by rivers as they slow down.

erosion [ee•ROH•zhuhn] The process of moving sediment from one place to another.

mechanical weathering [muh•KAN•ih•kuhl WETH•er•ing] A process by which rocks are broken down through physical methods.

runoff [RUHN•awf] Water that flows over land without sinking in.

soil [SOYL] A mixture of weathered rock, bits of dead organisms, water, and air.

transport [TRANS•pawrt] The movement of sediment from place to place by water.

weathering [WETH•er•ing] A process of breaking down rock.

Think About the Reading

1. What can you do to help you remember what you have learned?
2. What questions do you have after reading this book? How can you find the answers to your questions?

Hands-On Activity

Draw a landform such as a cliff or stone arch. You can do one of these.

1. Making another drawing of the same landform showing how it might be changed by erosion.
2. Show sediment transported by water.

School-Home Connection

Explain to a family member what you have read about weathering. Ask a family member to describe an example of weathering he or she may have observed.