

## ADVISORY 2, UNITS 4-5, LESSON 2 FOSSILS AND GEOLOGY

### Summary

- In this lesson, students will read "An Icy World" (pp. 10-17) to learn about the last ice age, how it changed Earth's surface, and how scientists can study the evidence it left behind to learn about Earth's history.

### Science Background

During the past 2.6 million years, otherwise known as the Quaternary period, Earth has gone through dramatic periods of climatic change. Earth wobbles as it orbits the sun. This affects the amount of sunlight that reaches the surface. As a result, Earth experiences ice ages, which are long periods of freezing and thawing.

During an ice age, temperatures drop and massive sheets of ice slowly inch their way across the planet. So much water is locked up in ice that sea levels fall and land bridges form between the continents.

When an ice age ends, it is followed by a warmer period called an interglacial. That is what we are experiencing on Earth now.

The last ice age ended about 10,000 years ago. As the climate warmed, the ice retreated and revealed a reshaped landscape beneath.

In some places, smooth mounds of sediment, dragged along by the massive ice sheets, settled to become fertile farmland. In others, glaciers formed wide, U-shaped valleys and fjords. And here and there strange rocks lie about. Different from all other rocks in the area, they sit where they were deposited when the ice finally melted.

Scientists study these features to understand Earth's history. They are evidence of how Earth has changed and reshaped itself over time.

### ENGAGE

Encourage students to flip through the articles and turn and talk with a partner to discuss what they see. Invite students to ask questions or share what they already know about ice ages.

### EXPLORE

Instruct students to examine the photo on pages 10-11 of their Readers. Point out this photo may show what Earth's landscape looked like during the last ice age. Brainstorm ideas about what it would be like to live during an ice age.

### EXPLAIN

Remind students that Earth has gone through five ice ages in the past 2.5 million years. **Ask:** *What do scientists think caused the last ice age to occur?* (Earth's orbit changed. Less sunlight reached Earth, so its climate got slightly colder. Snow accumulated and ice sheets formed.) Have students turn and talk as they discuss the impact ice sheets had on the size of Earth's continents and oceans. (The ice sheets stored more of Earth's water so there was more dry land and the oceans were smaller.) Challenge students to explain how the ice sheets changed Earth's surface. (When the ice sheets expanded and moved, they gouged the ground. They shaved off mountaintops, widened valleys, and moved rocky debris southward.) Then have students make a list of specific types of evidence that scientists can study today to learn about the last ice age. (U-shaped valleys, fjords, erratics, deep gouge lines, etc.)

### ELABORATE

Invite students to read the National Geographic Education encyclopedic entry "Ice Sheet" (<https://www.nationalgeographic.org/encyclopedia/ice-sheet/>) to learn about ice sheets that exist on Earth today. Brainstorm ideas about how Earth would change if all of these ice sheets melted.

### EVALUATE

Have students complete the **Content Assessment** for this lesson. Encourage them to share and compare their results in small groups.

Name \_\_\_\_\_

Date \_\_\_\_\_

## CONTENT ASSESSMENT: The Last Ice Age

Describe what Earth's surface was like at different times in history.

18,000 years ago

12,000 years ago

Now

What causes ice ages to occur on Earth? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

What evidence can scientists study to learn about the last ice age? \_\_\_\_\_

\_\_\_\_\_

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