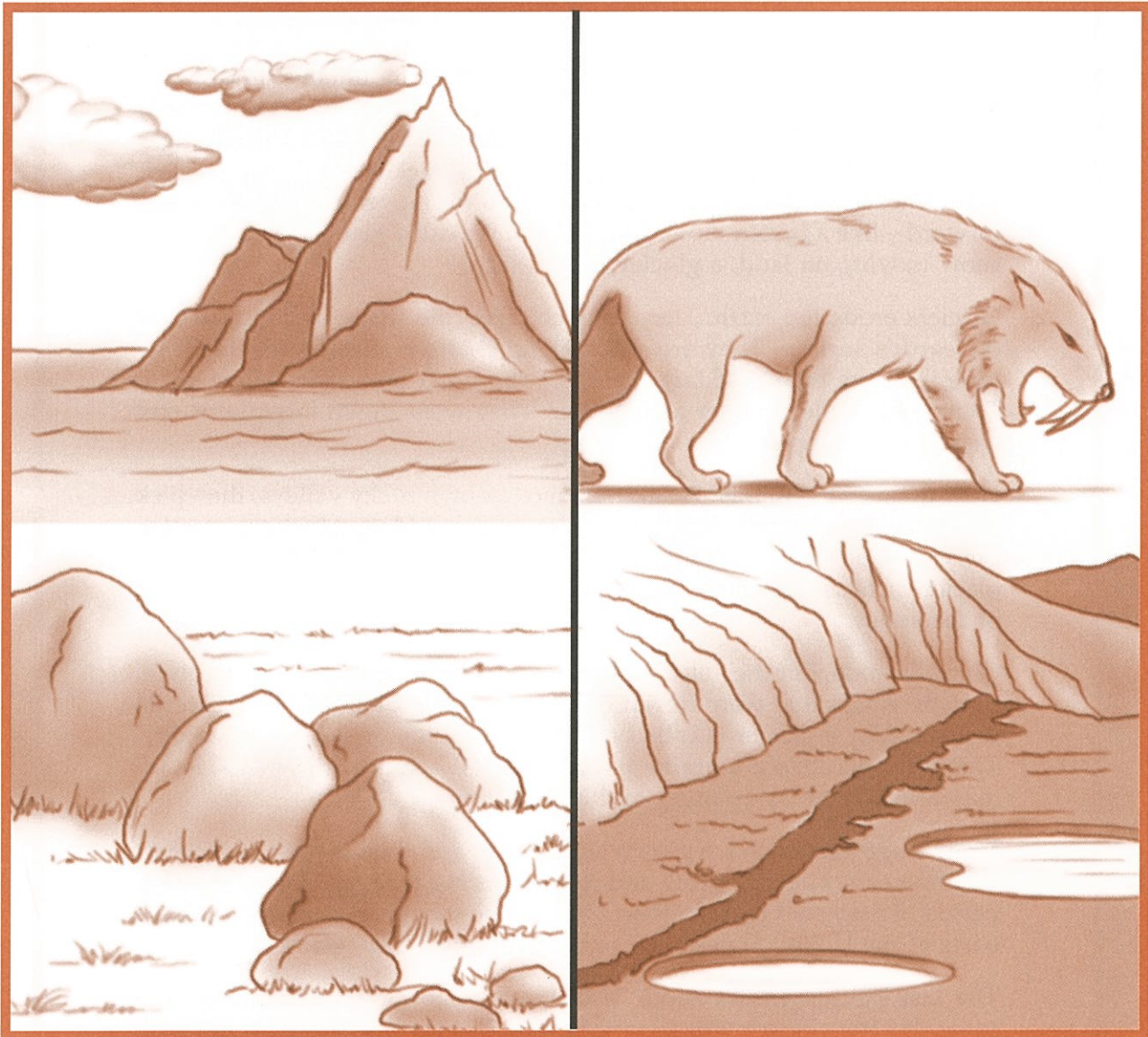


How do glaciers change the earth's surface?



KEY TERMS

glacier: moving river of ice and snow

till: rock material deposited by a glacier

moraine: ridge of till deposited by a retreating glacier

LESSON | How do glaciers change 17 | the earth's surface?

In some places, it is always cold. On very high mountains, and in the polar regions, it never rains. It only snows, and the snow never melts. It piles up and up. It becomes higher and higher. In time, the snow changes to ice. And the ice layer becomes thicker and thicker. When it gets very, very thick, the weight of the ice makes it move. Slowly it creeps forward—like a frozen moving mountain. We call a giant sheet of ice and snow moving on land, a **glacier** [GLAY-shur].

Glaciers erode the earth. They have changed the shape of large parts of the earth's surface. They are still making changes, even today. Little by little, glaciers break off large parts of the crust and carry them away. They make valleys wider and deeper. They wear down mountains and change their shapes.

How do glaciers do this? As glaciers move down rocky valleys, they pick up assorted fragments. Some are as large as boulders. Most are smaller. They include rocks, pebbles, sand, and even dust. Material carried by glaciers acts as abrasives. They erode other rocks on the floor and sides of the valley.

Glaciers erode, but they also build. When a glacier reaches a warm place, it melts. Rocks that were frozen into the ice are left behind. The material deposited by a glacier is called **till**. The till builds up a long, low ridge. This ridge is called a **moraine** [moor-AYN]. When a glacier melts, its till may also pile up as mounds, and large flat areas.

Many huge glaciers have grown and spread and then melted in the past million years. Glaciers grow and spread during ice ages. An ice age is a period of very cold temperature. You may be surprised to learn that large parts of the United States were once covered by huge glaciers.

The last ice age ended about 11,000 years ago. Scientists believe that some day the glaciers will advance again. But do not panic! Do not rush for an ice shovel! The next ice age will not happen for a very long time.

EFFECTS OF GLACIERS

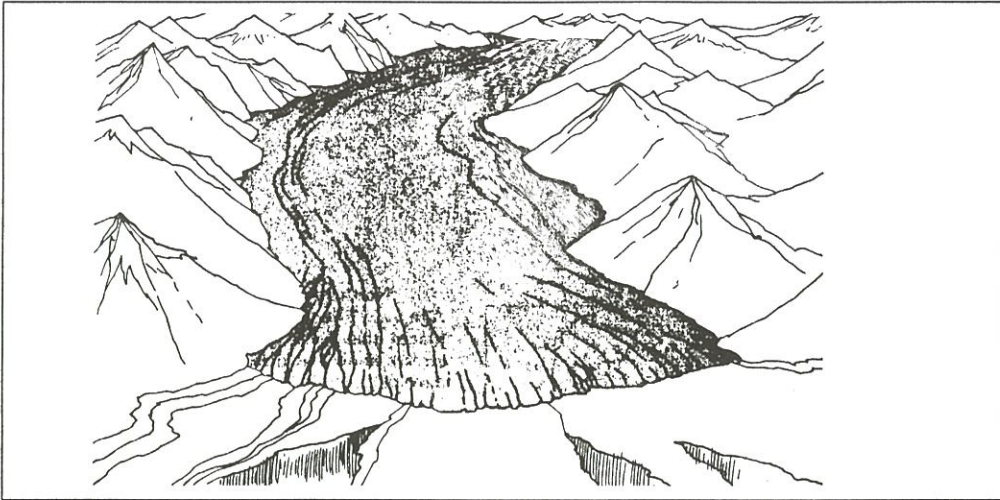


Figure A This glacier is moving along a valley. It is making the valley wider and deeper.

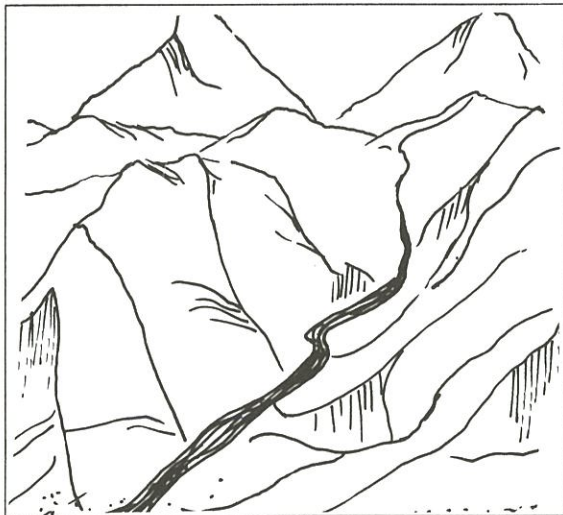


Figure B A valley before glacial erosion.

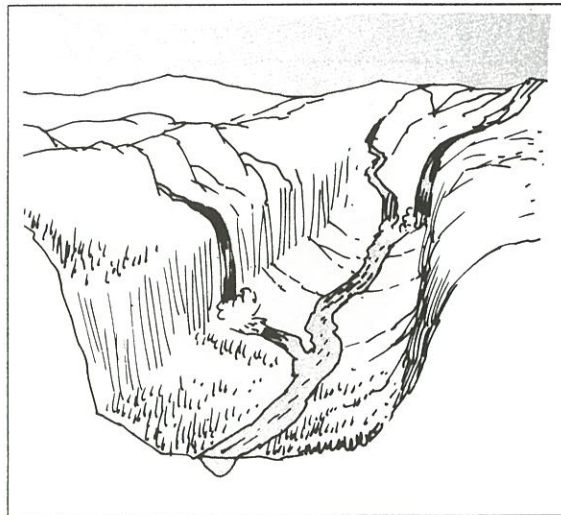
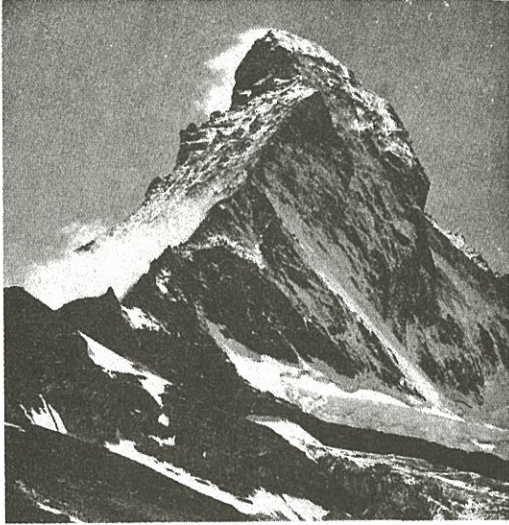


Figure C The same valley after glacial erosion.

1. Are there streams? _____
2. Are there waterfalls? _____
3. The shape of the valley is like the letter _____ .
U, V
4. Are there streams? _____
5. Are there waterfalls? _____
6. NOW the shape of the valley is like the letter _____ .
U, V
7. Glacial erosion changes _____ shaped valleys to _____ shaped valleys.
U, V U, V
8. Glacial erosion _____ waterfalls.
creates, destroys



This mountain was not always this shape. Large parts of the mountain were plucked off by the force of the glacier.

Figure D



North America during the last Ice Age . . . The white area shows the places that were covered by glaciers. The arrows show the direction the glaciers moved.

Figure E



Parts of the basins of the Great Lakes were dug out by a glacier.

Water from the melted glacier filled the basins.

Figure F

FILL IN THE BLANK

Complete each statement using a term or terms from the list below. Write your answers in the spaces provided. Some words may be used more than once.

ice
till
pressure of its
own weight
break away

the United States
slowly
rocks
snow
deepen

rub
carry off
widen
pebbles

1. Glaciers are made up of _____ and _____ .
2. A glacier moves because of the _____ .
3. Glaciers move very _____ .
4. Glaciers _____ and _____ big chunks of the earth's crust.
5. Examples of material carried by glaciers are _____ and _____ .
6. Fragments carried by glaciers _____ against rocks underneath and beside them.
7. Material deposited by a glacier is called _____ .
8. Glaciers _____ and _____ valleys.
9. Large parts of _____ were once covered by glaciers.

MATCHING

Match each term in Column A with its description in Column B. Write the correct letter in the space provided.

Column A	Column B
_____ 1. glacier	a) makes a glacier move
_____ 2. pressure of its own weight	b) made wider and deeper by glaciers
_____ 3. moraine	c) ended about 11,000 years ago
_____ 4. valleys	d) giant sheet of moving ice
_____ 5. last ice age	e) long, narrow ridge

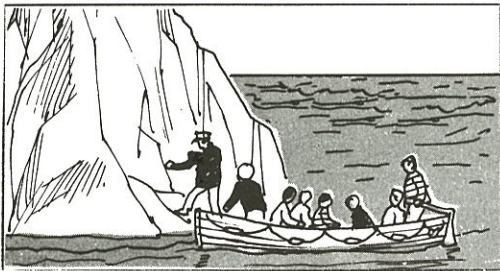
TRUE OR FALSE

In the space provided, write "true" if the sentence is true. Write "false" if the sentence is false.

- _____ 1. Snow pressed together can change to ice.
- _____ 2. A glacier moves by itself.
- _____ 3. Glaciers are small.
- _____ 4. A glacier is very powerful.
- _____ 5. Glaciers carry only small rock fragments.
- _____ 6. Glaciers only erode.
- _____ 7. Glaciers build mountains.
- _____ 8. Glaciers change "U"-shaped valleys to "V"-shaped valleys.
- _____ 9. The Great Lakes were formed by glaciers.
- _____ 10. There has been only one ice age.

REACHING OUT

The polar regions are covered with ice and snow. What would happen if all this snow and ice melted? _____



An iceberg is a huge broken-off piece of a glacier floating in the ocean.

Everyone knows that the ocean is salty. And no one should drink salt water.

Figure G

Now imagine this . . . You are on an iceberg, and you need water to drink.

- 1. Would you melt part of the iceberg to get this water? _____
yes, no
- 2. Explain your answer. _____
