

Oo-o-o-o-oo

Cause a glacier is a mass of resting ice

Land i-i-i-i-i-ice

Oo-o-o-o-oo

Or they can be floating in th-

Sea i-i-i-i-i-ice



Chapter 3

Erosional Forces



Lesson 2: Glaciers

Objective:

- explain how glaciers move
- describe evidence of glacial erosion and deposition
- compare and contrast till and outwash



A. How Glaciers Form and Move

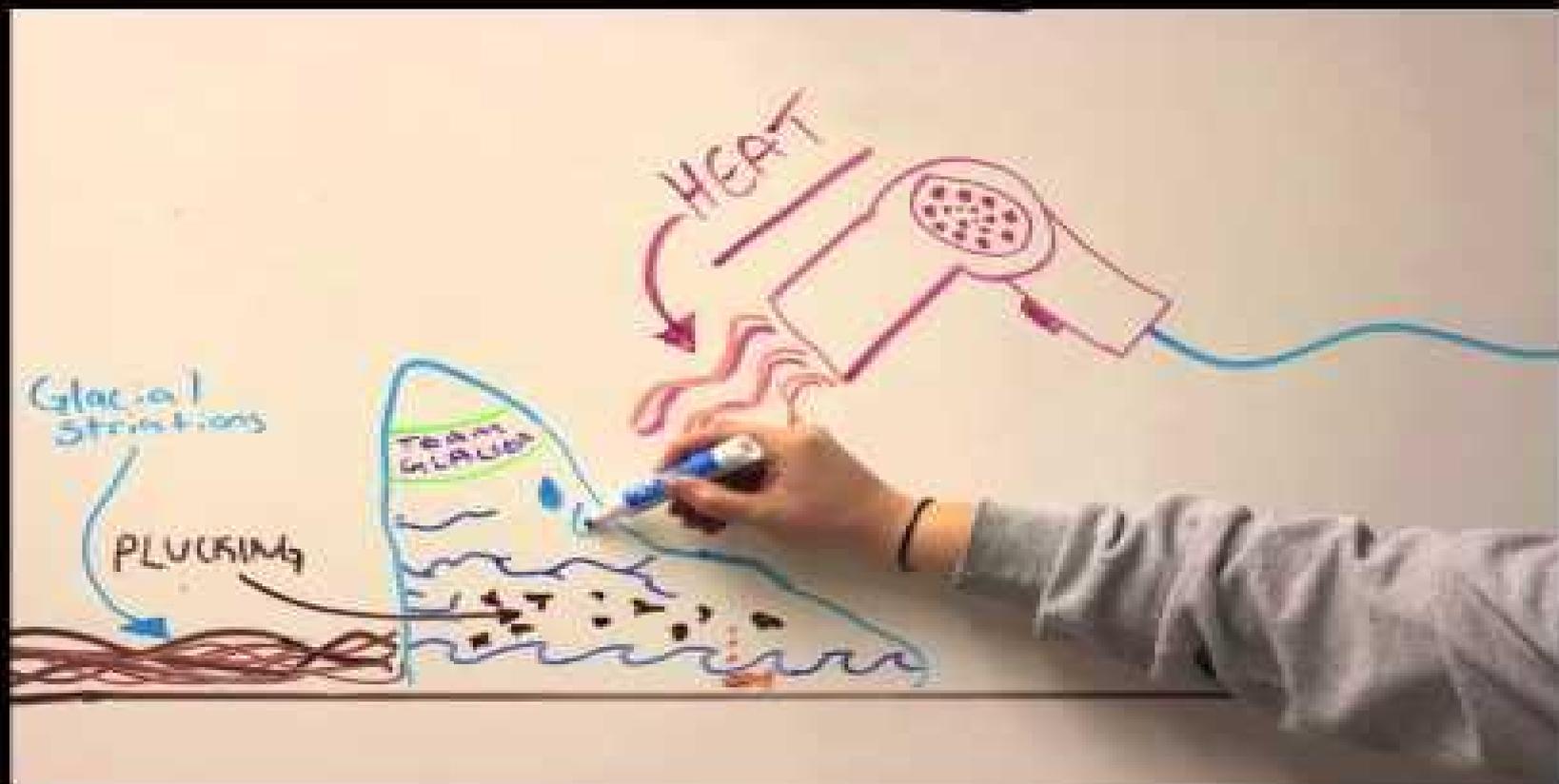
Glacier: a large mass of ice and snow moving on land under its own weight.



How glaciers move

The weight of the glacier causes ice to flow outward like pancake batter on a griddle. Under some conditions, glaciers also can slide over the ground





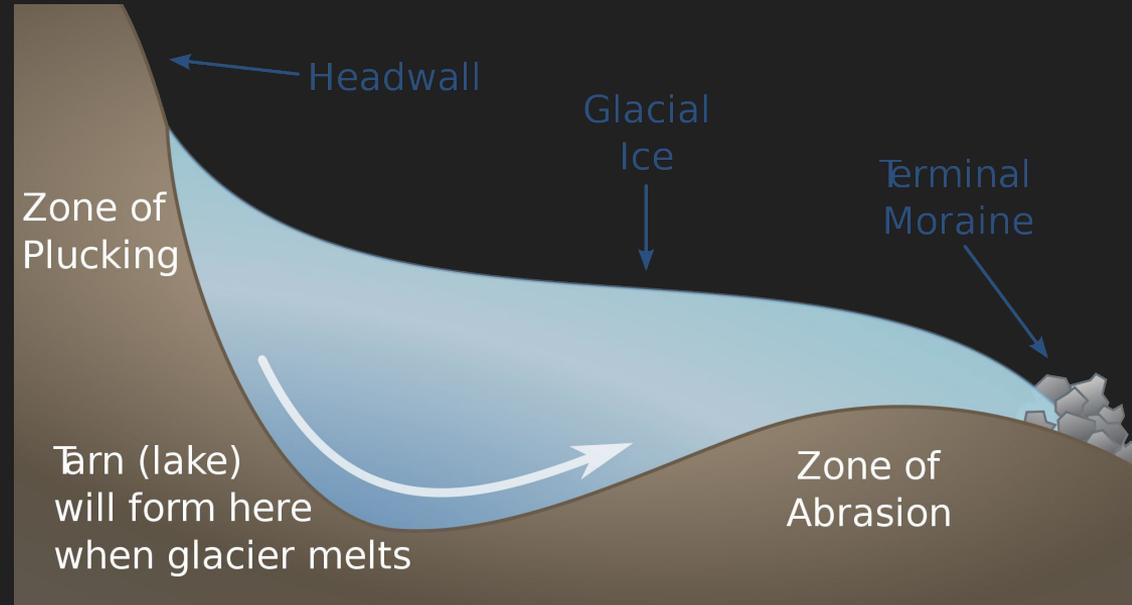


B. Ice Eroding Rock

Glaciers are agents of erosion that change the surface of the earth by:

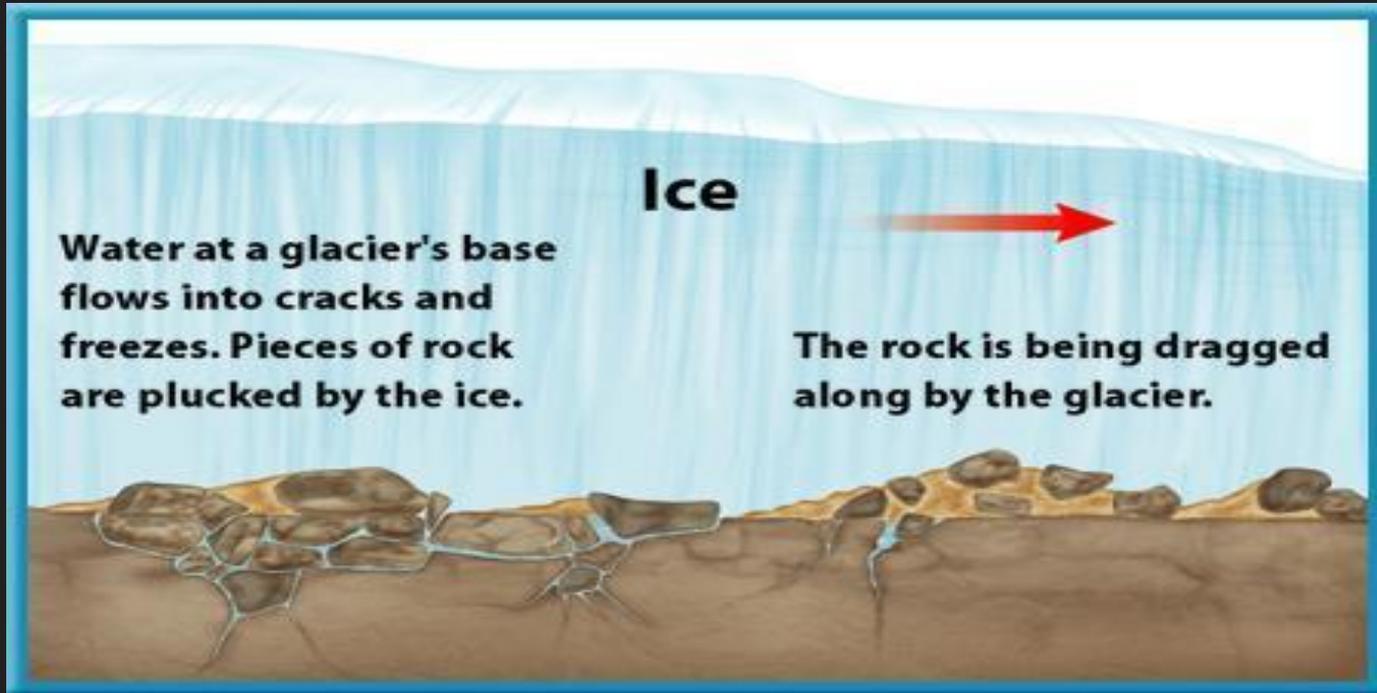
Plucking

Transporting and Scouring



1. Plucking

the process that occurs when a moving glacier picks up loosened rock particles



GLACIAL EROSION PLUCKING



2. Transporting and Scouring

Marks from plucking, called grooves, are deep, long, parallel scars on rocks.

Shallower marks are called striations.





Plucking



Ice wedging occurs



Breaks rock apart



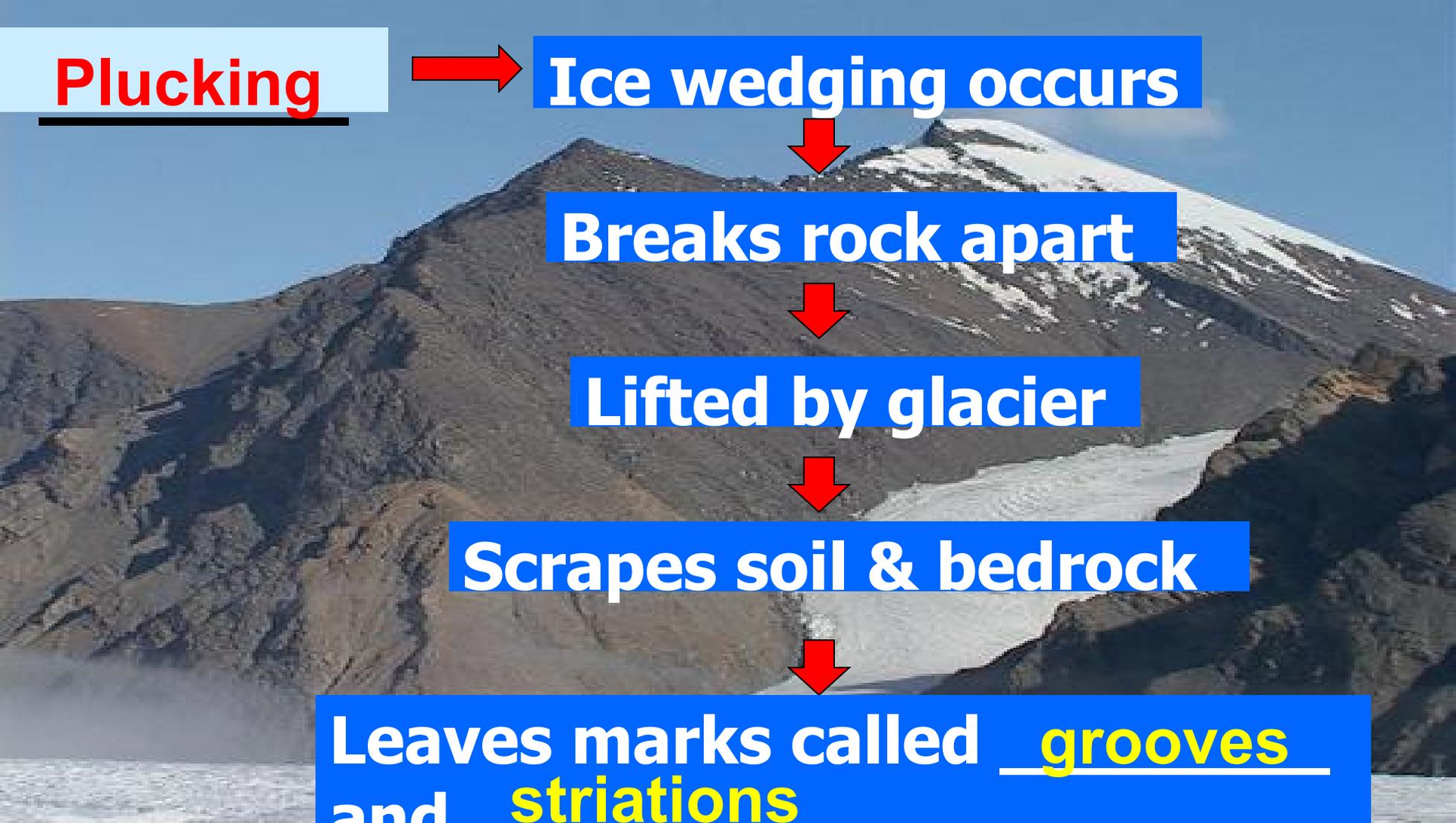
Lifted by glacier



Scrapes soil & bedrock



**Leaves marks called grooves
and striations**



Under a Glacier

- **The next image was taken in Skaftafell, Iceland, deep underneath a glacier in an ice cave. As the glacier moves it collects dirt and grit but in places where it doesn't it allows light to travel through the turquoise ice, creating this surreal environment.**



C. Ice Depositing Sediment

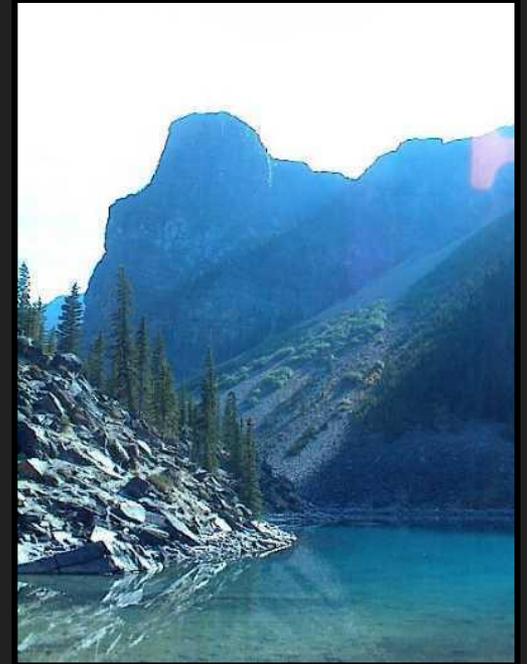
Till:

Boulders, sand, clay, & silt dropped from the base of a glacier when it slows down.



1. Moraine Deposits

a large ridge of rocks and soil deposited by a glacier when it stops moving forward





2. Outwash Deposits

Materials deposited by meltwater from a glacier



3. Eskers

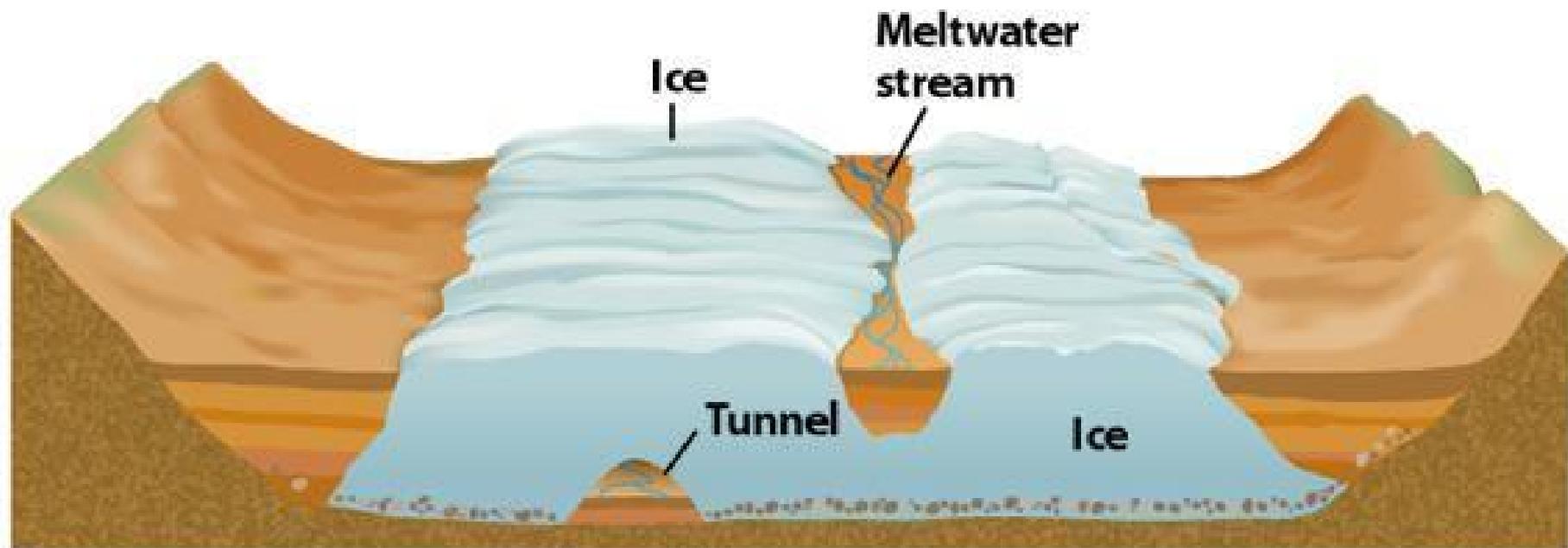
Outwash can deposit
sediments in two ways...

1. fan-shaped

2. long, winding ridges (ESKERS)



Esker





D. Continental Glaciers

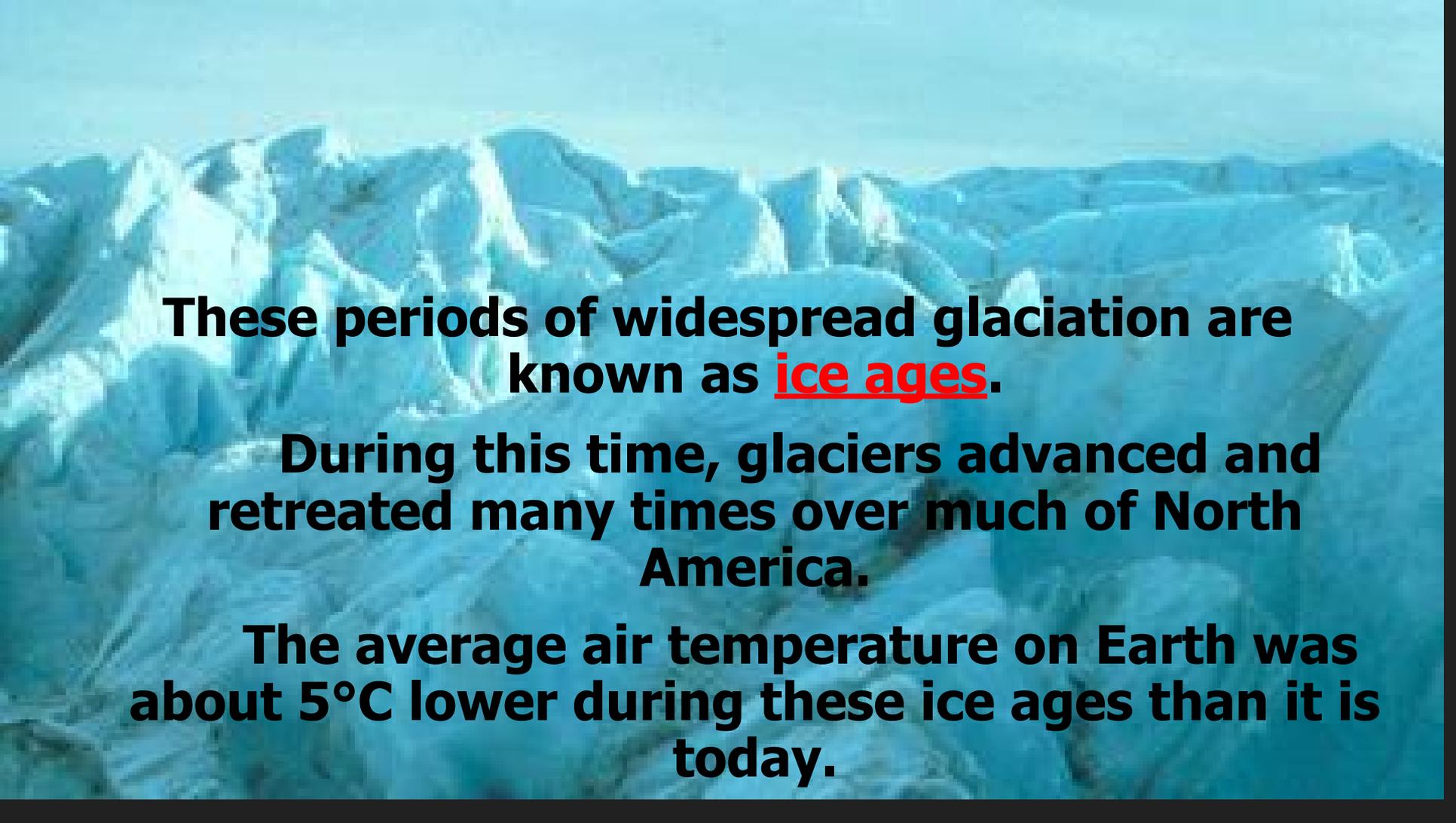
Cover 10% of the Earth mostly near the poles



1. Climate Changes

In the past, continental glaciers covered as much as 28 percent of Earth.



A photograph of a vast, snow-covered mountain range under a clear blue sky. The mountains are rugged and covered in thick white snow, with some peaks reaching into the sky. The sky is a pale, clear blue. The overall scene is bright and serene.

These periods of widespread glaciation are known as ice ages.

During this time, glaciers advanced and retreated many times over much of North America.

The average air temperature on Earth was about 5°C lower during these ice ages than it is today.

E. Valley Glaciers

Occur in high mountains where the temperature stays cold enough to not melt the ice.

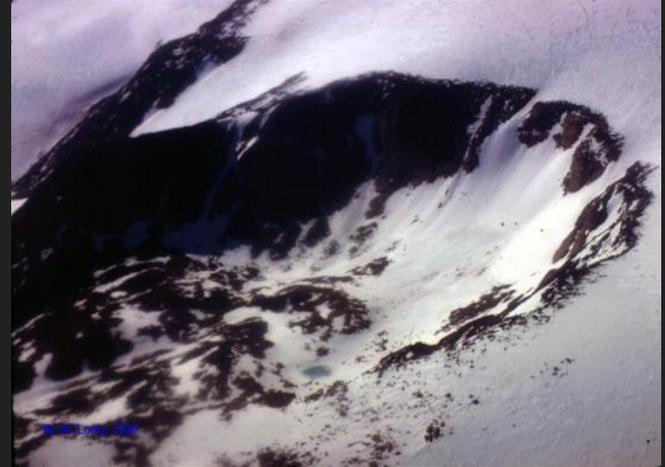


Mount Kilimanjaro
in north Tanzania,
Africa

1. Evidence of Valley Glaciers

Valley glaciers erode bowl-shaped basins, called **cirques**, into the sides of mountains.

If two valley glaciers side by side erode a mountain, a long ridge called an **arête** forms between them.





**bowl-shaped basin
in the sides of
mountains**

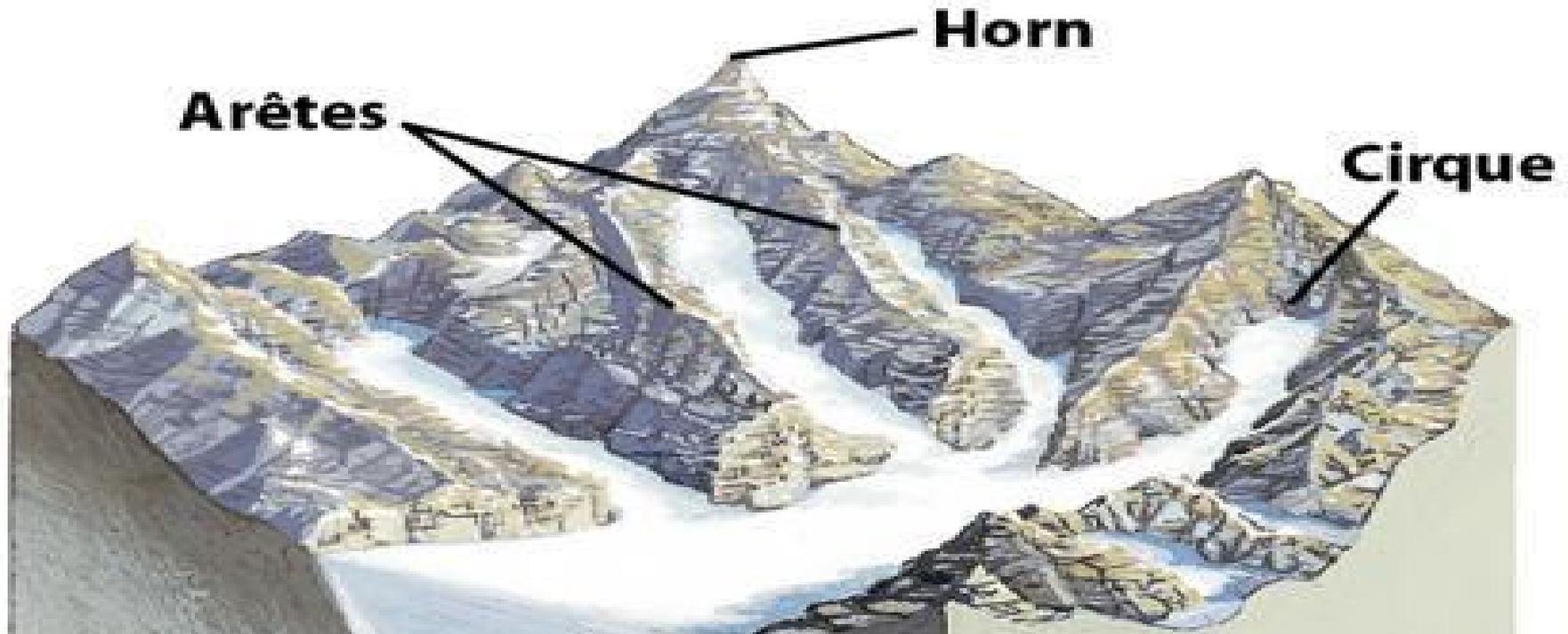
CIRQUE

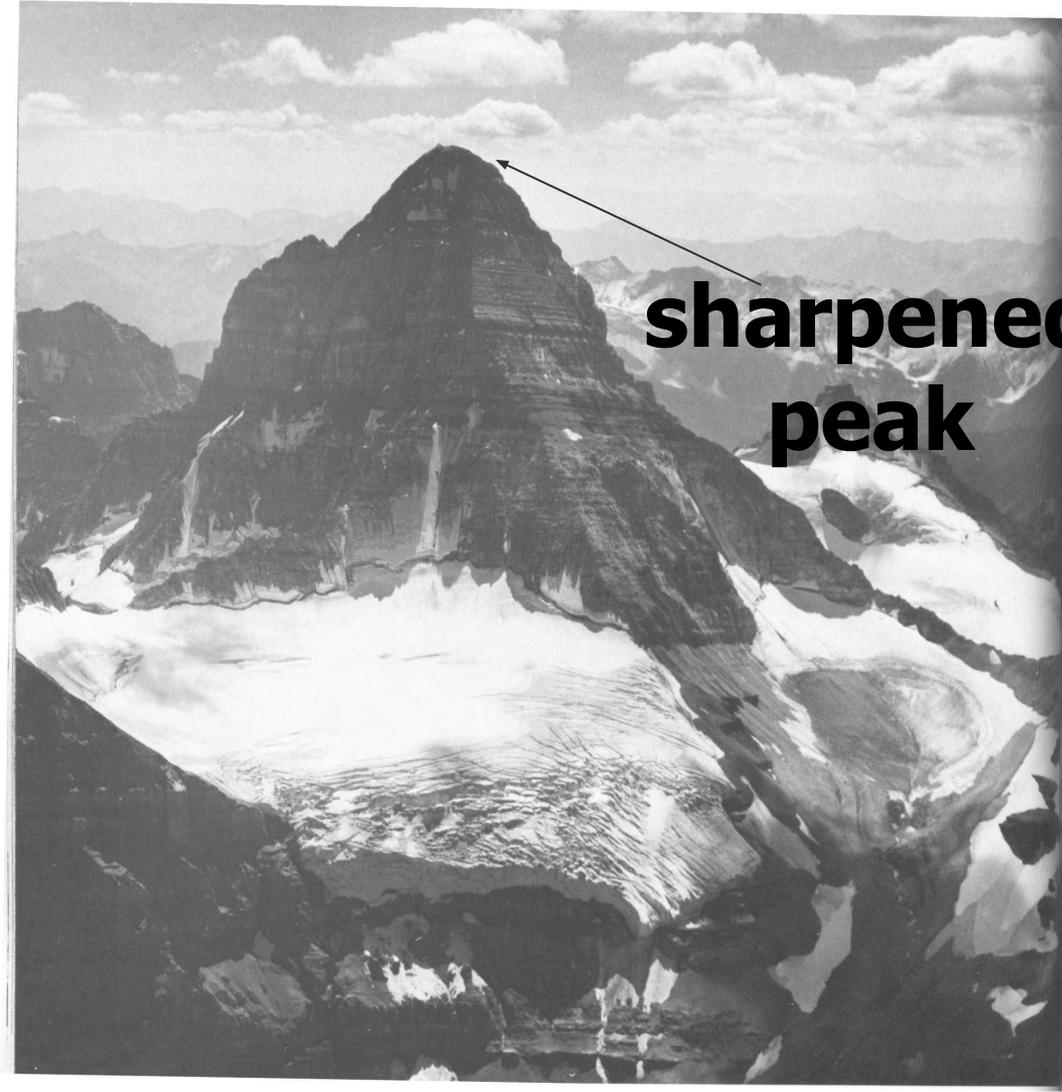
Arête



**a long
ridge**

If valley glaciers erode a mountain from several directions, a sharpened peak called a **horn** might form.

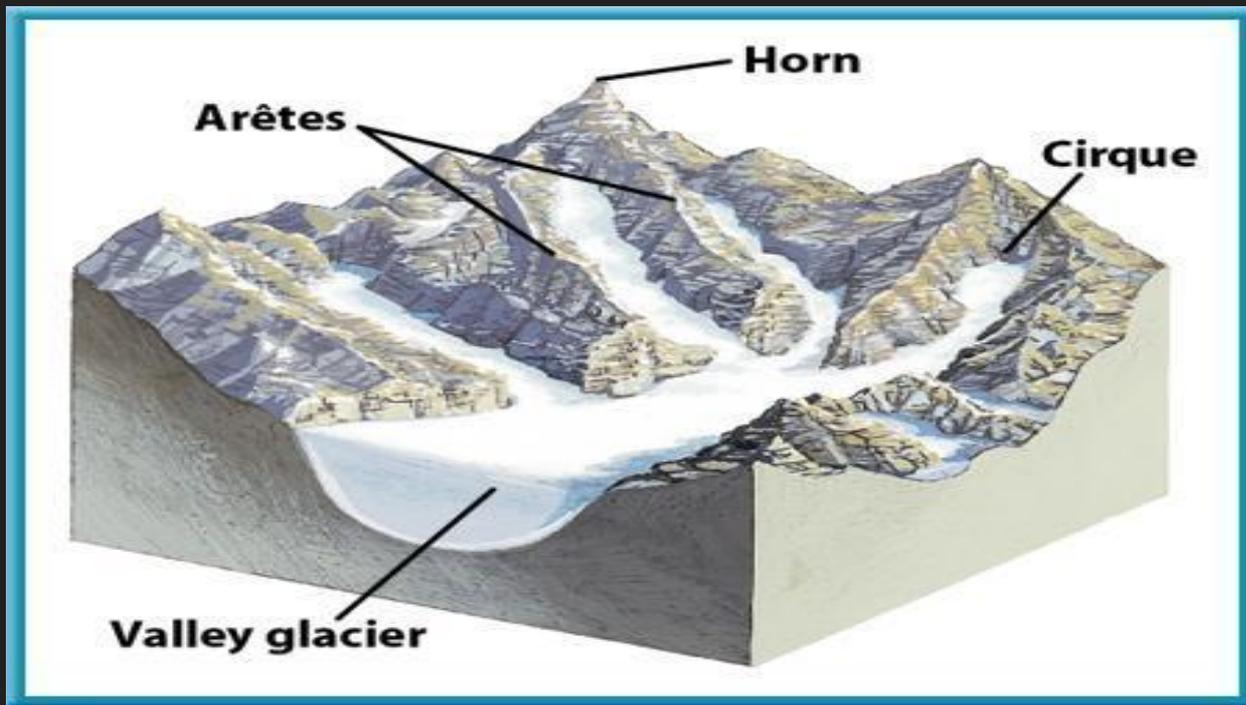




**sharpened
peak**

HORM

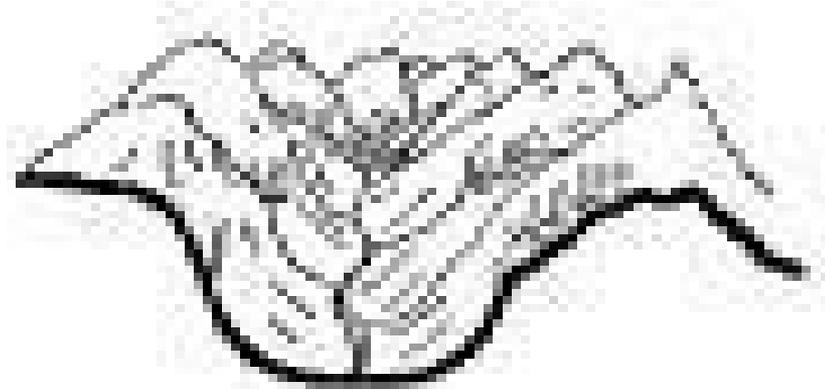
Valley glaciers flow down mountain slopes and along valleys, eroding as they go.



Glacially eroded valleys are **U-shaped because a glacier plucks and scrapes soil and rock from the sides as well as from the bottom.**



V-shaped valley



U-shaped valley



Today, glaciers in polar regions and in mountains, continue to change the surface features of Earth.



In addition to changing the appearance of Earth's surface, glaciers leave behind sediments that are economically important.

The sand and gravel deposits from glacial outwash and eskers are important resources.

Let's Review!!!

1. Continental glaciers are huge masses of ice and snow.
2. Today, continental glaciers cover 10% of Earth, mostly near the poles in Antarctica and Greenland.
3. Valley glaciers erode bowl-shaped basins, called cirques into the sides of mountains.
4. Glacially eroded valleys are U-shaped because a glacier plucks and scrapes soil and rock from the sides as well as from the bottom.