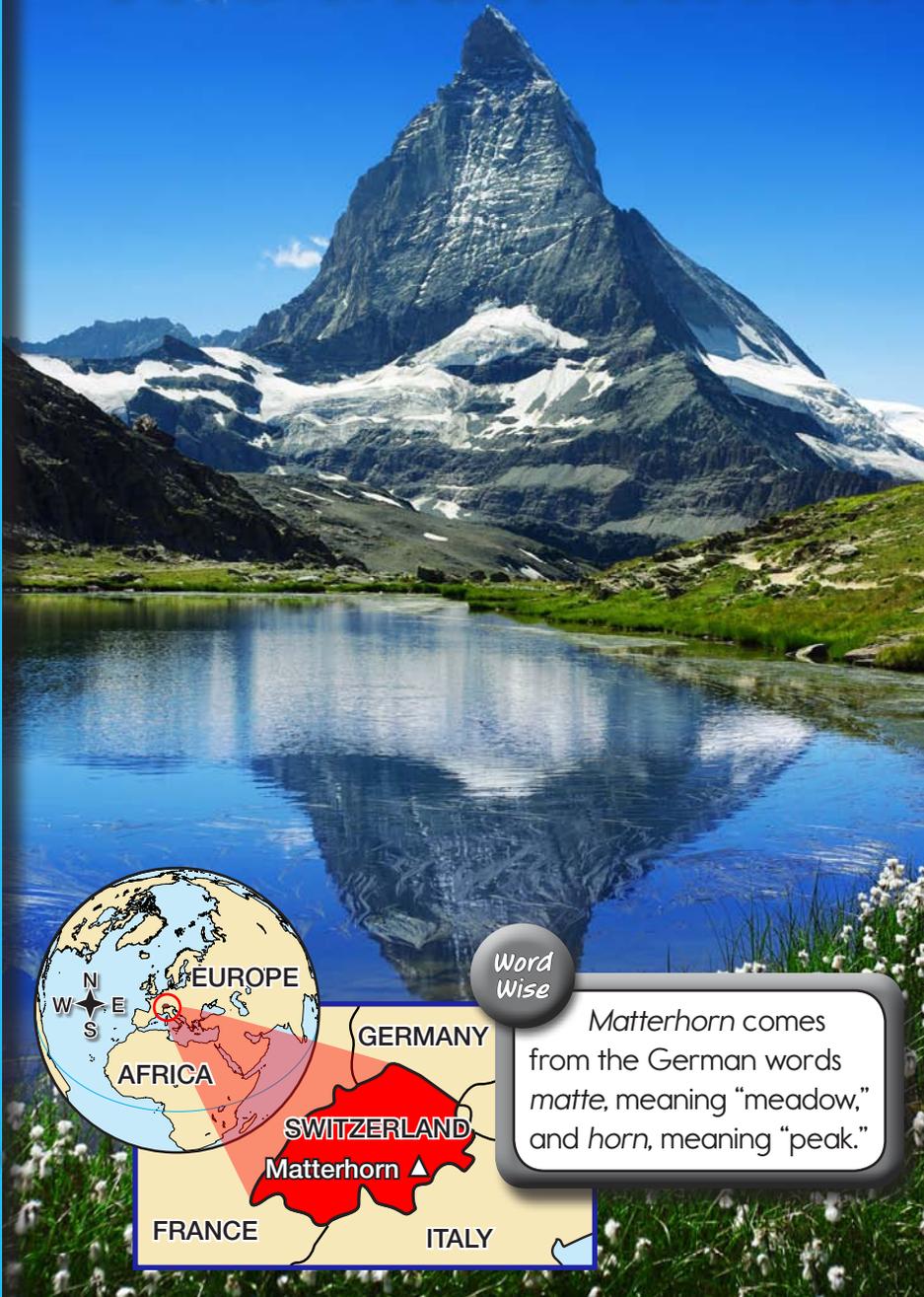


The Matterhorn



A HORN THAT MATTERS

Have you ever heard of the Matterhorn? You might think it's just a famous roller coaster or perhaps a musical instrument with a funny name. But it's really a gigantic rock peak that was carved by icy glaciers.

The pyramid-shaped Matterhorn sits high in the rocky mountains of Switzerland, which are known as the Swiss Alps. Millions of years ago, plate tectonics slowly pushed these mountains toward the sky. But it was erosion by glaciers that shaped them into jagged peaks.

A mountain glacier looks stable, but it actually moves gradually over time. You can think of it as a slow, frozen bulldozer. Gravity is the engine that powers it downhill. As the icy bulldozer moves over the rocky land, it causes weathering and erosion. During weathering, the glacier breaks, scrapes, and grinds the mountain rocks. During erosion, the glacier picks up and moves pieces of these rocks down the slope.

Sometimes three or more glaciers flow down different sides of a mountaintop. The glaciers act like spoons in ice cream. Each scrapes down one of the sides, removing material as it goes. What's left behind is a sharp-sided peak called a *horn*. The Matterhorn's peak was formed in just this way. The shape of the land changed from a rounded mountain to a pointed peak over thousands of years thanks to the natural force of moving ice.

Word Wise

Matterhorn comes from the German words *matte*, meaning "meadow," and *horn*, meaning "peak."

HOW THE MIGHTY CRUMBLE

Mountains appear mighty, but they are no match for glacial erosion. Glaciers are mountain destroyers that erode the rock of mountains through two main processes: plucking and abrasion.

Plucking happens when pieces of broken rock are picked up and moved by a glacier. As a glacier slowly moves over rock, the massive weight of the ice shatters the rock beneath it. Some ice may melt and seep into rock cracks. When the water freezes again, it expands and breaks the rock into pieces. The loose rocks and sediment get *plucked*, or picked up, and carried away by the flowing ice.

The rocks and sediment embedded in the glacier act like sandpaper. They scrape and grind the mountain as the glacier flows. This is called *abrasion*. Abrasion creates scratches and grooves on the rock surface, sometimes even polishing the surface smooth like glass. The ice may also cut up the rock, carving more pieces for the glacier to pick up and transport far downslope. Even after a glacier has melted or retreated, evidence of abrasion remains on the rock's surface.

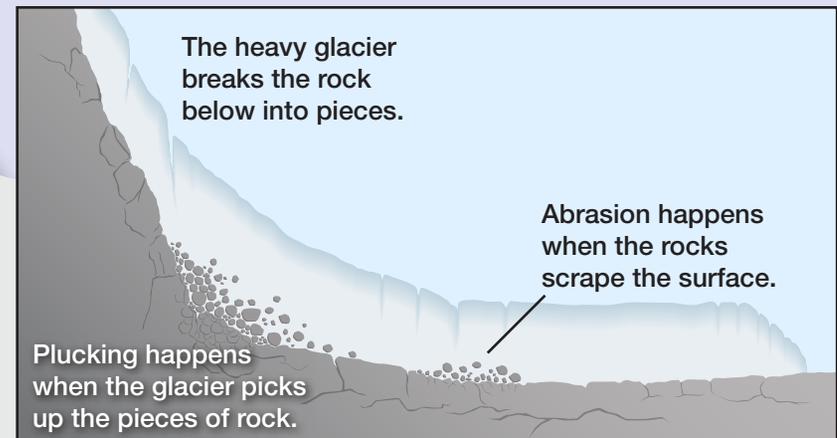
Wowser!

The Matterhorn's steep slopes make it difficult and dangerous to climb. But that hasn't stopped mountain guide Richard Andenmatten. He has reached the peak of the Matterhorn more than 800 times!



Climbers on the Matterhorn's peak

HOW HORNS FORM



Abrasion by a glacier can scratch deep, long grooves in the rock over which it moves. These grooves on Kelley's Island in Ohio are some of the longest—up to 123 meters (400 ft.) long and 11 meters (35 ft.) wide!

Do You Know?

Glaciers transport a wide range of particle sizes, from tiny specks of dust to huge boulders the size of houses.