

1.1 Carving the Land

1. Partners that Shape the Land

- a. Erosion: The process of wearing away of rock and soil, and then moving it from one place to another.
 - i. Water causes the most erosion on Earth.
- b. Weathering: The breaking up of rock material into smaller pieces.

2. Breaking Up, Wearing Down

- a. What are two ways rocks change?
 - i. Water dissolves some of the minerals in rock (like salt) making it weaker
 - ii. Weak acids can cause the rock to weaken
- b. Once a rock is weakened, cracks form in the rock
 - i. Then, water gets in and freezes
 - ii. Over time, the freezing and thawing of the water can cause weathering of the rock
 1. This breaks it into smaller pieces.

3. From Trickle to River

- a. River System: a river and all the waterways that drain into it
 - i. Example: Mississippi River System (largest in U.S.)
- b. Sediment: material carried by moving water and wind
 - i. Fast moving rivers can even move boulders

4. How River Valleys Form

- a. Over time, rivers can carve deep valleys
 - i. As water moves along the sides of the valley, the water breaks up rock and soil and carries them away.
 - ii. The soil above the eroded side caves in.
 1. This causes the valley to get deeper & wider

5. When Water Slows Down

- a. When a river reaches an ocean, the water slows down
- b. This causes the sediment in the water to sink or drop
 - i. This causes a delta to form

6. Delta: a flat plain formed at the mouth of a river (triangle)

1.2 The Changing Shoreline

1. Wearing Away the Shoreline

- a. The major causes of weathering and erosion are moving water and wind

- i. Waves: remove sand/soil and deposit it somewhere else, sometimes far away; summer=gentler, winter=rougher
 1. This produces the sand found on ocean beaches

2. Building Up the Shoreline

- a. Headland: a natural piece of land that extends into the water
 - i. Bay: a body of water partly surrounded by land & open to the ocean (mouth)
- b. Barrier Island: long thin island made by water slowing down along headlands and dropping its sediment (Cape Hatteras, NC)

Sand Blasted

1. Wind Blows Away Land

- a. The stronger the wind, the more sediments it can carry
- b. The wind is more likely to erode land when it is dry
- c. Windbreaks: anything that slows the wind
 - i. Examples: snow fences, shrubs, dune fences

2. Wind Carves the Land

- a. Wind erodes Earth's surface by removing sand and silt from one place and depositing them in another
- b. The sediments carried by wind also weather Earth's surface

3. Wind Builds Up the Land

- a. Wind will carry sediments until something (like a fence or boulder/shrub) slows it down
- b. Sand dunes: piles of sand deposited in one place by wind
- c. Butte: a narrow-topped hill with steep, cliff-like sides
- d. To carve buttes, polish rock, and make sand dunes, wind has to attack, wear down, and carry away pieces of Earth's land

Glaciers—Nature's Bulldozers

1. Glacier: a huge mass of slow-moving ice that forms over land

- a. Continental Glacier: "ice sheets", found only in Greenland and Antarctica, gigantic masses of ice
- b. Valley Glacier: river of ice, found in high mountain ranges

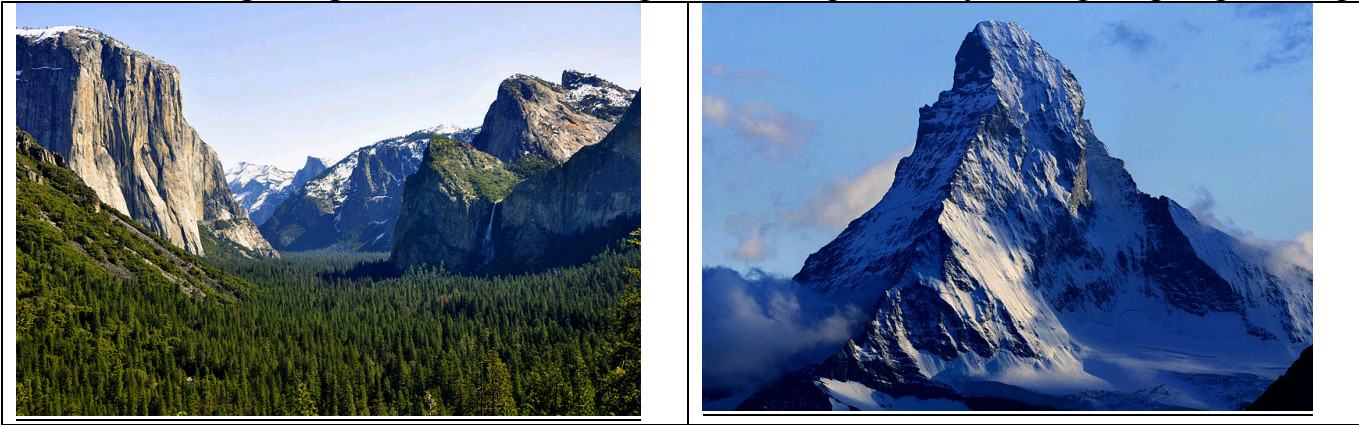
2. How Glaciers Move

- a. The enormous weight of the ice causes the glacier to spread out in all directions
- b. Valley Glacier: gravity is the main force that makes valley glaciers flow

- c. Moraine: rock material carried by a glacier
- d. Terminal Moraine: the moraine left at the farthest point a glacier moved to before melting
- e. Glacier Grooves: grooves and lines left in the ground after a glacier has melted
- f. Erratics: large boulders dropped by glaciers as they melt

3. What Ice Leaves Behind

- a. Signs a glacier has been in a place: U-shaped valleys, sharp ridges, pointed peaks, waterfalls, lakes



- b. Horn: pyramid-shaped peak (Matterhorn)
- c. Glaciers shape the land in two ways
 - i. As it moves across land, it carries away tons of material
 - ii. When the glacier stops and melts, it leaves behind boulders and rocks along its path