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