November 1, 2017

6th Grade Weathering and Erosion Review

***Vocab***

* **Rocks:** mixtures of different elements and chemical compounds that combine to form hard, solid materials of the Earth’s surface.
* **Weathering:** the breaking down of rocks caused by exposure to air, moisture, and organic materials
  + Small-scale, surface changes on rocks
* **Physical weathering:** breaking down of rock material into small fragments or pieces
  + Chemical components of rock remain unchanged
  + **Frost-wedging:** water seeps into cracks in rock and freezes. When the water freezes, it expands and cracks the rock
  + **Plants**: as a plant grows, its roots can put pressure on rock and crack it
  + **Animals**: burrowing loosens and weakens rock, ex, prairie dogs
  + **Gravity**: ever-present force that pulls down on all matter on Earth
    - Avalanche or rock slide dislodges rock, exposes more rock to weathering
* **Chemical weathering:** decomposition of rock material due to the chemical reaction of compounds in the rock with chemicals in the environment
  + Changes chemical composition of rock materials acted upon
  + Not all rocks are composed of the same chemicals or minerals, so chemical weathering affects rocks differently
  + **Carbonic acid**: produced naturally by combination of carbon dioxide and water
  + **Acid rain:** caused by pollution
    - Sulfur released into air by factories, combines with water
* **Erosion:** the processes by which rock and soil materials are loosened and transported from one place to another
  + Large-scale changes over great distances
  + Rivers, valleys, canyons
  + **Wind erosion**: sand grains carried by strong winds act like sandpaper and scrape away little pieces of rock and soil from hills and mountains
    - Can pick up soil from plains or fields and transport particles to other areas
  + **Water erosion**: begins with a single raindrop!
    - **Three factors that influence amount of water erosion:**
      * Rainfall intensity and runoff: more intense rain, more erosion
      * Slope gradient (how steep the slope is): steeper slope, more erosion
      * Vegetation/obstacles (big rocks): more plants, LESS erosion
* **Soil:** the mixture of organic component, sand and gravel that makes up the upper surface of the Earth.
  + The end result of weathering and erosion
  + Sand and pebbles come from the weathering of rock
  + Humus is organic material that comes from decomposing plant and animal material
* **Structure of Earth**
  + **Crust**: surface of Earth
  + **Mantle**: semi-solid middle layer
    - Convection currents in mantle cause movement of tectonic plates
  + **Core**: middle of Earth, iron and nickel
    - Extreme heat and under extreme pressure
* **Convection currents**: hot material rises and cool material sinks
  + Convection currents in the mantle force materials up onto the Earth’s crust to create new crust, which pushes tectonic plates into one another (this causes continental drift!)
* **Continental drift**: the movement of tectonic plates, which make up Earth’s crust
  + Think Pangea
* **Igneous rock**: magmatic rock formed through the cooling of lava or magma
* **Sedimentary rock**: rock formed when sand, mud, and pebbles are deposited on top of each other
  + These layers are squashed into each other until they form rock
  + Many fossils are found in sedimentary rock
* **Metamorphic rock**: type of rock that has been changed by extreme heat and pressure

**Steps of the Rock Cycle**

1. Molten rock from the mantle rises to the surface and creates new crust
   1. This molten rock cools and forms *igneous* rock
2. As a result of weathering, rock breaks down
3. Over time, broken down rocks are layered on top of each other to form *sedimentary* rock
4. As more and more rock builds up, pressure and temperature increase *a lot*
5. This increased pressure and temperature form *metamorphic* rock
6. Metamorphic rock sinks into the mantle and melts into magma, becoming part of the mantle
7. Through convection, the magma is pushed back up to the surface and creates new igneous rock
   1. AND THE CYCLE REPEATS

***Focus Questions***

* **How are physical and chemical weathering different?**
  + Rocks are physically weathered by breaking them into smaller and smaller pieces. Rocks are chemically weathered when compounds in the rock react chemically with another chemical.
* **How do physical and chemical weathering combine to weather rocks?**
  + By breaking rocks into smaller pieces, physical weathering exposes more of a rock’s surface to chemical weathering. The combination of the two speeds the overall process of weathering.
* **What occurs when erosion takes place?**
  + When erosion takes place, soil is moved from one location to another.
* **What factors increase or decrease erosion?**
  + Soil from a steep slope will be eroded more than the soil from a less steep slope.
  + Obstacles such as rocks and vegetation will decrease the erosion of soil from the slope.
  + Heavier, more intense rainfall will cause more erosion than lighter rain showers.
* **What are some components of soil?**
  + Some components of soil include gravel, organic matter, and sand.
* **How are the different components of soil different from each other?**
  + The different components of soil are different chemically and in size.
* **What happens when tectonic plates push against each other?**
  + Material at impact site is pushed up, creating mountains
  + Weathering and erosion processes SLOWLY wear away these mountain ranges