**Weathering Guided Notes** Name:

Weathering is the process by which rocks on or near Earth’s surface break down and change

Two types of weathering can occur:

**Mechanical Weathering**

- Process by which rocks and minerals break down into smaller pieces. Doesn’t involve any change in a rock’s
 , only in the size and shape of the rock
**1.) Frost** **Wedging:** repeated and of water. When water is trapped in the cracks of rocks and rock layers, it freezes and expands, putting pressure on the rock and cause rock to
 . This is the cause of many in roads
 **2.) Thermal Expansion**: repeated daily heating and cooling of rock. Heat causes and
 . Different minerals expand and contract at different rates, causing stresses along
 boundaries. In the desert, temperature changes between day and night.
**3.)** **Exfoliation/unloading**: process by which rock layers are away. Caused by expansion of rock due to and ; removal of deep burial pressure. Outer layers of rock are able to be stripped off in succession, like an onion. Example: like exfoliating your skin. - **Abrasion**: the process of scraping or wearing away caused by and
**4.)** **Biological Weathering:** occurs when rocks are broken down as a result of growth
**5.)** **Salt Crystal Growth**: occurs when salt water between rock at shorelines

**Chemical Weathering**

- Process by which rocks and minerals undergo changes in their composition as a result of

 reactions, result in the formation of new .

*The Four Agents of Chemical Weathering:*

**1.) Water:** many kinds of minerals and rocks. Serves as a through which other reactions occur. is a chemical reaction of water with other substances (example: decomposition of silicate minerals).

* Caves and caverns typically form in . Speleothems are cave formations made of calcite. Travertine form from the ceiling as stalactites and on the ground as stalagmites.
* **Karst Topography**: forms on limestone terrain in rainy regions, characterized by….
* **Water Leaching:** process by which water carries minerals to lower rock layers

**2.) Oxygen:** makes up of Earth’s atmosphere. The chemical reaction of oxygen with other substances is called . Oxygen combines with iron-bearing silicate minerals causing
“ .”

**3.) Carbon Dioxide:** produced by living , in a process called . Carbon Dioxide forms a weak carbonic when combined with precipitation. Carbonic acid reacts with minerals such as calcite in limestone and marble to rocks.

**4.) Acid Rain:** precipitation that has a pH value below 5.6 (pH of normal rainfall). The lower the pH the more acidic. Sulfur dioxide is formed from the industrial burning of . Nitrogen oxides are emitted from . Both of these gases combine with water and oxygen in the atmosphere to form and acids. Aquatic species are sensitive to changes in pH values and as a result, as a result they serve as environmental indicators when there are high levels of acid rain.

**5.) Biological Action**: lichens, fungi, and other micro-organisms chemically break down the rock.

*What affects rate of weathering?*

**1.) Climate:** as temperature increases the of chemical reactions increases. Heavy rainfall produces high levels of acid. High levels of evaporation removes ground water increase reaction rate as well.

**2.) Rock Type and Composition: weathering** is when rocks weather at different rates. How hard or resistant rocks are to being broken down will affect how easily they are weathered**.**
 rocks easier to weather than metamorphic or igneous rocks

**3.) Topography**: refers to the of the land with regard to , and greatly affects erosion and drainage. - Steep slope = in water runoff and erosion; not much water can seep into plant roots,
 weathering as water moves quickly over rocks- Gentle/no slope = in water runoff and erosion, weathering as water stay on rocks in pools. - Surface Area= the most important factor affecting the rate of weathering. Smaller particles have more surface area. Mechanical weathering surface area then chemical weathering can the rock.