**Mineral Notes:**

**Unit 1: Materials and Processes that Shape a Planet**

**Mini-Unit:** Chemistry of the Earth

**Goal 2**: The student will demonstrate the ability to describe and classify materials that make up Earth

**Objectives – The student will be able to:**

* Use selected properties to identify common rock forming mineral groups, including carbonates, halides, oxides, silicates, sulfates, and sulfides

**Textbook:** Chapter 5, Page 103

Characteristics of Minerals:

Mineral – a natural, usually inorganic solid that has a characteristic chemical composition, an orderly internal structure, and a characteristic set of physical properties

Determining if it is a Mineral?

1. Is it inorganic? – an inorganic substance is a substance that was not created from living things such as coal and oil
2. Does the substance occur naturally? – minerals form and exist in nature, things like brass and steel are manufactured
3. Is the substance a solid in crystalline form? – if a substance does not have a regular, repeating pattern as a solid, it is not a mineral
4. Does it have a consistent chemical composition? – if the ratio of ingredients does not remain constant, it is not a mineral

Kinds of Minerals:

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1. More than 4,000 minerals but only 20 are common
2. These common 20 are called rock forming minerals because they form the rock that makes up the crust
3. 10 of these twenty are so common that they make up 90% of the mass of the Earth’s crust

Silicate Minerals – a mineral that contains a combination of silicon and oxygen and that may also contain one or more metals

Non Silicate Minerals – a mineral that does not contain compounds of silicon and oxygen

Types:

1. Carbonates – compounds that contain a carbonate group (CO3)
2. Halides – compound that consists of chlorine or fluorine combined with sodium, potassium, or calcium
3. Native Elements – elements uncombined with other elements
4. Oxides – compounds that contain oxygen and an element other than silicon
5. Sulfates – compounds that contain a sulfate group (SO4)
6. Sulfides – compounds that consists of one or more elements combined with sulfur

Physical Properties of Minerals:

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1. Color – some minerals have very distinct colors that lead to identification, however most of the time it is an unreliable clue for identifying a sample
2. Streak – the color of a mineral in powdered form after being drug across a ceramic tile
3. Luster – the way in which a mineral reflects light
4. Cleavage – in geology, the tendency of a mineral to split along specific plants of weakness to form smooth, flat surfaces
5. Fracture – the manner in which a mineral breaks along either curved or irregular surfaces
6. Hardness – the measure of the ability of a mineral to resist scratching

Mohs Hardness Scale – the standard scale against which the hardness of minerals is rated; you scratch the unknown minerals against those on the scale, its harder if it can scratch the mineral, its softer if it can’t scratch the mineral, it’s the same hardness if both can scratch each other

1. Crystal shape – minerals always form in the same crystalline structures due to their chemical compositions
2. Density – the ratio of the mass of a mineral to its volume (mass/volume)