Name_____ Date_____ Section_____ **Earth Science Notes 3.2**

AIM: How can we identify different minerals? **Unit 3:** Rocks and Minerals: How does the Earth make rocks?

Do Now:

1) Why do a few elements such as oxygen, silicon, potassium, and calcium show up in so many minerals? _____

_____

2) Coal is a rock that is made up of dead plant material. Why is coal NOT a mineral? _____

3) Graphite and diamond are both composed of carbon. Why are the physical properties of graphite and diamond so different? _____

_____

By the end of this class you should be able to:

- ☐ Describe the properties of a mineral using vocabulary such as cleavage/fracture, hardness, luster, and streak
- ☐ Test and record the different properties of a mineral
- ☐ Figure out what mineral you are observing based on its properties

Key Terms/Concepts Notes/Explanations

What properties can be used to identify a mineral?

- ☐ _____**:** doesn't always work because sometimes same mineral will be different, sometimes different minerals will have the same
- ☐ _____**:** color of the mineral's powder; scrape mineral against a streak plate to see color it leaves behind
- ☐ _____**:** how easily a mineral can be scratched
  - use _____

Index Mineral	Scale	Common Objects
Diamond	10	
Corundum	9	
Topaz	8	
Quartz	7	Steel file (6.5)
Orthoclase	6	
Apatite	5	Glass (5.5)
Fluorite	4	Knife blade (5.1) Wire Nail (4.5)
Calcite	3	Penney (3.5) Fingernail (2.5)
Gypsum	2	
Talc	1	

- ☐ _____: mass/volume
- ☐ Cleavage/Fracture: _____
- ☐ _____: how a mineral reflects light
  - Metallic=_____
  - Nonmetallic=_____

Summary & Reflection:

HW: Make vocabulary cards or foldables for the following words. On the front, draw a picture to help you remember the word. Put the definition on the back. Bring all your flashcards from Unit 2 and this unit for Monday.

Atom	Smallest unit of an element -Made up of protons, electrons, and neutrons
Element	Substance that cannot be broken down any farther without changing its properties
Chemical reaction	When you combine different substances to make a new one or when you break up a substance into different ones with completely different properties
Chemical formula, chemical composition	Symbols to show which elements are found in a substance and the ratio of the elements Example: H_20 has 2 hydrogen atom and 1 oxygen atom
Why are a few elements found in so many minerals?	The Earth's crust is mostly made up of only a few elements so the most abundant elements will be found in many minerals.
Mineral	Made up of one or more elements and must -be **natural** -be **inorganic** (not come from living things) -have solid **crystal structure** (atoms are arranged in a set pattern) -have a **definite chemical composition** (has the same ratio of elements)
What determines a mineral's properties (how it looks, how it reacts with chemicals)?	1. chemical composition: what elements are in the mineral? (Example: minerals with $CaCO_3$ will bubble when put with acid) 2. arrangement of atoms: how are the atoms arranged in the mineral? (Example: diamond and graphite are both made of Carbon, but graphite has areas with weak bonds between the atoms so it is soft)
Luster	How a mineral reflects light Metallic: shiny like metal Nonmetallic: everything else
Hardness	How easily a mineral can be scratched -measured using Moh's Scale 1=soft (Talc)→10=Hard (Diamond)
Streak	Color of mineral's powder -scrape mineral sample against streak plate to see the color of its powder
Cleavage	Mineral breaks along smooth, flat edges
Fracture	Mineral breaks along rough, jagged edges
Displacement method	Way to measure the volume of a mineral: put mineral in graduated cylinder and measure how much the water level went up