Name: _____ Section #

Physical Geology Exercise #1
The JMU Mineral Museum - Observing Physical Properties of Minerals

Welcome to the JMU mineral museum! If you enter the room and the case lights are not on, press the three (3) light switches just inside the doorway on the right hand side as you enter. The display is dominantly organized in a systematic classification and the mineral group in each cases is labeled at the below the case. Use these group names to help locate the minerals described in this exercise. Now that you have completed the physical properties of minerals exercise in lab, here is an opportunity to refresh what you have learned and enjoy the beauty of minerals. Please enjoy your time in the museum and feel free to come back as often as you like. Also, please turn off the case lights when you leave.

*One of the first physical properties that help identify a mineral is **luster**, or the way a mineral reflects light. You have learned to distinguish between metallic and non-metallic luster.*

What mineral group (as observed in the museum) exhibits the largest percentage of minerals with metallic luster?

***Color** is not always a unique physical property used to identify a mineral. You will find a large variety of different minerals in the JMU mineral museum.*

Find and record the names of three (3) minerals that display at least 3 different colors

Mineral # 1:

Color #1:

Color # 2:

Color # 3:

Mineral # 2:

Color #1:

Color # 2:

Color # 3:

Mineral # 3:

Color #1:

Color # 2:

Color # 3:

Cleavage *is the term used to describe how a mineral breaks repeatedly along planes of atomic weakness in the mineral structure. Cleavage is described by both the number of planes observed as well as the angular relationship between those planes.*

Fluorite can be found in the halide case. The majority of the fluorite crystals you see in this case form which shape?

Triangles Cubes Hexagons Stars

Now find the four (4) fluorites that have been cleaved. What is the cleavage on fluorite (hint: read the label)

This means that fluorite has how many directions of cleavage?

One Two Three Four Six

Can you see all of them? If not, be sure to ask your instructor for help.

A large calcite cleavage is on the bottom of the carbonate case. What is the cleavage on calcite (hint: read the label)

This means calcite has how many directions of cleavage?

One Two Three Four Six

Are the cleavages at right angles (90 degrees) to each other?

Yes No

Calcite is made up of calcium atoms and carbonate ionic groups (bonded carbon and oxygen atoms). Its chemical formula is $CaCO_3$. The mineral magnesite is composed of magnesium and carbonate ionic groups with a chemical formula of $MgCO_3$.

Find the magnesite specimen on the top shelf of the carbonate case. Does it have the same cleavage as calcite?

Yes No

Would you expect the cleavage in Siderite ($FeCO_3$) to be the same or different from calcite?

Same Different

Why?

Find specimens of biotite, muscovite and chlorite (clinochlore) in the phyllosilicate case (they are all on the same shelf). How many directions of cleavage do you observe?

One Two Three Four Six

Do the most of the other phyllosilicate minerals on the shelf have the same cleavage?

Yes No

Before you leave, be sure to go into the back room and enjoy the fluorescent mineral display. Some minerals will fluoresce (give off light) when subjected to ultraviolet light. Fluorescence is another physical property that geologists can use to identify minerals.