**Introducting Rocks**

**Igneous Rocks**

*Part One*

1. Have students, two or three working together, pull out a predetermined set of rocks

For example: Granite, diorite, gabbro, peridotite, rhyolite, andesite, basalt, vesicular basalt, pumice, obsidian, and tuff

1. Ask the student to put the rocks in groups based on some shared characteristic that they see. Don’t give them any ideas just ask them to put the rocks together in groups and write a brief description of what characteristics that group all possess. Since many will find it hard to put obsidian in a group with other rocks, I inform the students that they may put one and only one rock in its own group by itself.
2. Give them a few minutes to work through the rocks and their descriptions.
3. When they are finished, have them list their rock group members and the characteristics of the group on the board.
4. Ask the class to look at the list and see if they see any pattern, same rocks grouped together by many different student pairs.
5. At this point, we go through a discussion of classification schemes: What are they used for? Is their classification if the rocks incorrect? Why or why not?

*Part Two*

1. Ask them to line up a set of rocks as follows:

Granite Diorite Gabbro Peridotite

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Rhyolite Andesite Basalt

1. Working in groups of two or three still, ask them to figure out what is different about the top row and the bottom row with respect to rock texture, which I define for them as referring to the size, shape, and arrangement of grains in a rock.
2. Have each group report or out go around individually and see what they figured out. You want each group figuring it out so that none is relying on the other groups to do the work.
3. They should notice that the top row is coarse-grained and the bottom row is fine-grained.

From here you can jump off discussing the rock cycle or the mineral make-up of the rocks or anything else that you think would be best to carry on the discussion.

**Sedimentary Rocks**

*Part One*

1. I begin with the siliciclastic sedimentary rocks but you could rearrange this any way you would like. Ask the students to get a set of siliciclastic sedimentary rocks out of their box and arrange them like this:

Conglomerate the sandstones in one group siltstone mudstone

1. Ask the students, working in groups of two or three, to determine why they were arranged in this order with respect to rock texture. They should respond that they are arranged in order of decreasing grain size.
2. Determining roundness and sorting: I have a roundness and sorting comparator available to them either as a picture in their lab or as a manufactured comparator.
3. We go through each of the rocks identifying minerals and roundness and sorting

As I go through the rocks, I have them look at each one and ask questions to guide them to see the grains, the minerals, etc. I say a bit, they do a bit, back and forth.

**Metamorphic Rocks**

1. Have the students get out the following rocks (or similar ones) out of the box and put them on the table in this arrangement:

Slate Phyllite Schist Gneiss

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 Mable Quartzite Hornfel

1. Ask the students to determine what all the rocks in the top row have in common but the bottom row does not (with respect to rock texture). The should come up with something like: the top row has layers and the bottom row does not.

After that, I jump into a discussion of foliation, differential vs. confining stress, and then the rocks themselves.

When going through the foliated rocks, I ask the students to compare shale to slate, slate to phyllite, phyllite to schist, and schist to gneiss. These comparisons are jumping off points for going through mineral composition, foliation types, etc.

The key to introducing rocks in this manner is to give the students a chance to explore then learn. It also utilizes the do-talk-do style of active learning. They are not sitting passively; they are actively participating in the class.