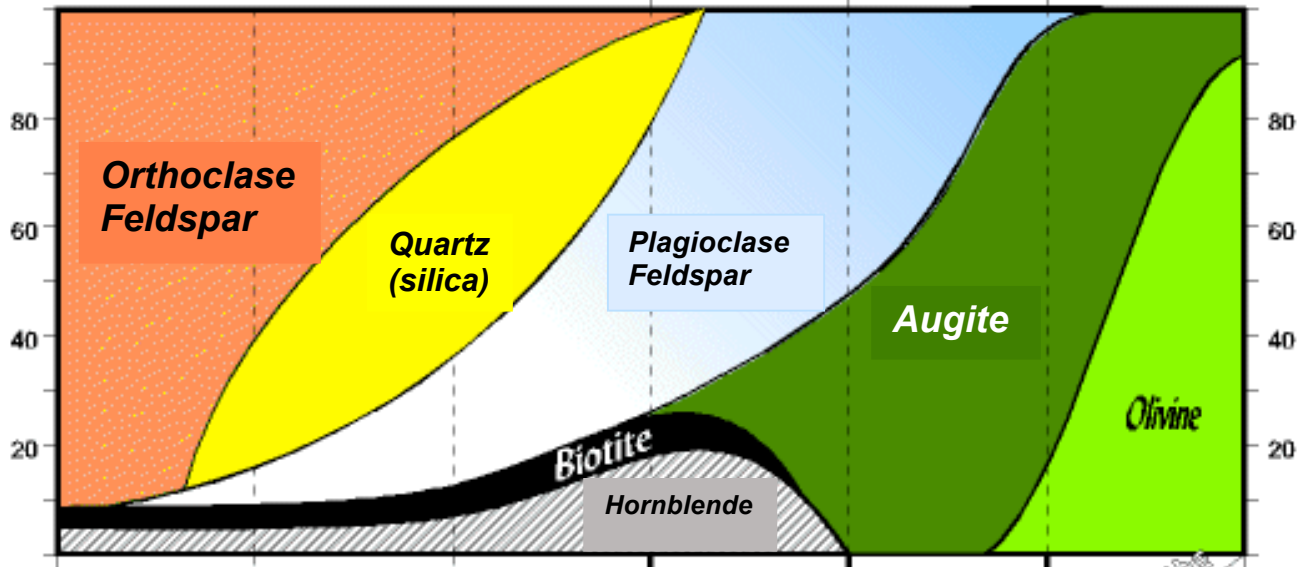


## Activity: Classifying Igneous Rocks



Volcanic Glassy		<b>Obsidian</b>		
Volcanic Vesicular		<b>Pumice</b>	<b>Scoria</b>	
Volcanic Fine-Grained	<b>Rhyolite</b>	<b>Andesite</b>	<b>Basalt</b>	
Plutonic Course-Grained	<b>Granite</b>	<b>Diorite</b>	<b>Gabbro</b>	

1. What two criteria are used to classify igneous rocks?
  
2. Circle the name of the most abundant type of plutonic igneous rock.
  
3. Put a box around the name of the most abundant type of volcanic igneous rock.
  
4. According to the chart (above), which mineral might be present in both granite and basalt?

5. What word is used to describe the texture of each of the following?

Andesite:

Scoria:

Obsidian:

6. What do gabbro and basalt have in common? Circle one.

Color/Minerals

Texture

7. How are basalt and gabbro different in the way they are formed?

8. Use the chart on the previous page to determine the percentage of quartz present in an average sample of granite.

\_\_\_\_\_ %

### **Now you're on your own.**

A. Get a set of igneous rocks, including a "classification sheet".

B. Place the rocks on the classification sheet, separating them into three groups according to color. Put the lighter-colored ones closer to the left and the darker ones closer to the right. Put the medium-colored ones in the middle.

C. Next, keeping the rocks separated by color, classify them according to texture also. Position the glassy one toward the top of the sheet, the vesicular ones in the next row, the fine-grained ones in the next row, and the coarse-grained ones in the bottom row.

D. Although obsidian is dark-colored, its mineral composition is more like the light-colored rocks, so move it over the left side of the classification sheet. Have your instructor check the arrangement of your rocks before you continue.

E. Now that you've classified your igneous rocks, figure out what they are and then write their names beneath them on the classification sheet.

F. Line up the tray of rocks beneath the tray of minerals and answer the follow-up questions.

### **Follow-Up Questions**

1. You should be able to see at least different minerals (different colored grains) in your granite. How many different minerals can you see?
2. According to the chart on the mineral tray, what are the 3 most common minerals that granite is made up of?
3. What are the three most abundant minerals found in basalt?
4. Are the minerals that make up basalt dark-colored, or light-colored?

5. What is the most abundant mineral in both andesite and diorite? \_\_\_\_\_
6. How is andesite different from diorite? Circle one.
- a. they contain different minerals (color)                      b. they cooled at different rates (texture)
7. Which cooled faster? Circle one: basalt or gabbro
8. Most of the mountains between here and Butte are made up of granite. What rock would have been formed if this magma had erupted onto the surface, rather than cooling slowly beneath the surface?
9. According to the chart on the first page, what is the main difference between pumice and scoria?
10. Why is andesite darker than rhyolite?
11. What is the “volcanic version” of diorite? \_\_\_\_\_
12. Use the chart on the first page to determine . . . .
- a. the percentage of plagioclase present in an average sample of andesite; \_\_\_\_\_
- b. the percentage of plagioclase present in an average sample of basalt; \_\_\_\_\_
- c. the percentage of augite present in an average sample of diorite; \_\_\_\_\_
- d. the percentage of plagioclase feldspar present in an average granite; \_\_\_\_\_
13. Granite and rhyolite are made of the same 4 or 5 minerals. You can see the different minerals (colors) in granite (4 or 5 different colored grains). Explain why can't you see them in the rhyolite.
14. Compare the pumice on your tray to the giant piece on the counter in front of the room. Why aren't they the same color?
15. Look at the large piece of porphyry on the counter in front of the room. Explain why the augite had enough time and space to form the big black crystals in this rock?

**Time to study the rocks:** Use the time you have left to study the rocks on your tray. During the test you will have to identify the same rocks that you have on the tray and you will have to answer several questions about them. Make sure everyone in the group can answer the questions below. Use this as a “study guide” to prepare you for rock portion of the test.

Put the “classification sheet” that the rocks are sitting on into the recycle box, and then pile the rocks in the center of the tray.

Make sure everyone in the group can answer each of the following questions. **If you get stuck, ask Benson.** If you want to come in before or after school for help, you are welcome to do so.

Can you identify these? rhyolite, basalt, gabbro, diorite, andesite, obsidian, pumice, scoria, granite

Which 3 are course-grained?

Which 3 are fine-grained?

Which one is glassy?

Which two are vesicular?

Which fine-grained volcanic rock has the same minerals as granite?

Which plutonic rock has the same minerals as basalt?

Which fine-grained one has the same minerals as diorite?

Which fine-grained rock has the least amount of quartz?

Which three (besides obsidian) have the most quartz?

Which 6 are volcanic?

Which 3 are plutonic?

Which 3 cooled slowly beneath the surface?

Which are the two most common types of igneous rocks?

Which one is the Boulder Batholith made of? (recent notebook entry may help)

Which one is the Columbia Plateau made of? (recent notebook entry may help)

Which one can be thought of as the “volcanic version” of granite?

Which one would andesite have become if it had cooled underground?

Which type of rock is the Grandstreet Theater made of?

Which type of rock makes up the two outer (newer) sections of the Capitol?

What kind of rock is Crown Butte made of? It is not one of the rocks on your tray.

Which three of the rocks on your tray formed as magma cooled slowly beneath the surface?

**You do not have to write out answers for these questions. Make sure everyone in your group can answer these questions.**