



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

### **Critical Thinking and Application**

1. What is an igneous rock?
  2. Define and explain the difference between magma and lava.
  3. Where do intrusive igneous rocks form?
  4. Where do extrusive igneous rocks form?
  5. Describe the size of the crystals you would expect to see in extrusive rocks and intrusive rocks.
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6. What factors determine the crystal size in an igneous rock?
  7. Why does molten rock material cool more slowly underground?
  8. How can two different rocks have the same mineral composition?

**Section 4-Igneous Rocks****A. Igneous Rock Formation**

- \* \_\_\_\_\_ (become a solid) and \_\_\_\_\_ (mineral crystals form) of molten (liquid) rock
- \* Mineral crystals interlock ( \_\_\_\_\_ ) together like a puzzle
- \* \_\_\_\_\_ -liquid rock beneath the surface
- \* \_\_\_\_\_ -Magma that has reached the Earth's surface

**B. Igneous Intrusions and Extrusions**

- \* Igneous \_\_\_\_\_ -When magma works its way into a crack in the rock and solidifies underground
- \* Igneous \_\_\_\_\_ -When lava flows along and solidifies at the surface

**C. Igneous Rock Classification**

- \* \_\_\_\_\_ -How big the crystal size is, not how it feels
- \* Very Coarse-Bigger than 10mm
- \* Coarse-1 to 10 mm
- \* Fine-Less than 1mm
- \* Glassy-No crystals at all
- \* \_\_\_\_\_ -Trapped gas pockets
- \* Igneous rocks are organized by texture!!!!

**D. Igneous Rocks**

- \* Interlocking crystals are the key characteristic of igneous rocks
- \* NO PATTERN TO THE CRYSTALS!!!

**E. Texture-Crystal Size**

- \* Depends upon how much time it takes for the lava or magma to cool off and turn to rock.
- \* Long time to cool-Big Crystals
- \* Short Time to cool-Small Crystals

**Igneous Rocks are Organized by Crystal Size****F. Environment of Formation**

- \* \_\_\_\_\_ form inside the Earth
- \* Plutonic
- \* Formed below the surface of the Earth
- \* Coarse grained rock
- \* Very coarse grained rock
- \* \_\_\_\_\_ =Large visible crystals...you can see them without a magnifying glass

**G. Environment of Formation**

- \* \_\_\_\_\_ form on the Exterior of the Earth
- \* Volcanic
- \* Formed at or near the surface of the Earth
- \* Fine grained rock
- \* Glassy rock-no crystals
- \* Vesicular rock-gas pockets
- \* \_\_\_\_\_ =small crystals or no crystals...cannot see crystals with naked eye...need magnifying glass.

Name \_\_\_\_\_

Date \_\_\_\_\_

### Igneous Rock Chart-Page 6

1. \_\_\_\_\_ crystals are a key characteristic of igneous rocks.
2. Igneous rocks form from \_\_\_\_\_ and \_\_\_\_\_ of lava or magma.
3. The time it takes for lava or magma to \_\_\_\_\_ determines crystal size.
4. \_\_\_\_\_ determines how igneous rocks are organized.
5. What is the texture of granite? \_\_\_\_\_
6. What is the grain size (crystal size) of basalt? \_\_\_\_\_
7. Plutonic is referred to as intrusive or extrusive? \_\_\_\_\_
8. Name a fine grained rock with no pyroxene minerals? \_\_\_\_\_
9. Compare rhyolite with basalt.....
  - a. Which has a lower density? \_\_\_\_\_
  - b. Which has a more mafic composition? \_\_\_\_\_
  - c. Which contains quartz? \_\_\_\_\_
10. Name a felsic, coarse grained, intrusive igneous rock? \_\_\_\_\_
11. Felsic rocks are generally \_\_\_\_\_ in color.
12. Mafic rocks generally have a \_\_\_\_\_ density.
13. Name an intrusive, dense, dark colored igneous rock? \_\_\_\_\_
14. Intrusive rocks have (large/small) crystals because of (slow/fast) cooling.
15. Extrusive rocks have (large/small) crystals because of (slow/fast) cooling

### Complete the Chart Below!!!!

Rock	Formed From...	Cooling Rate	Crystal Size	Texture
Rhyolite	Lava		Small	
Gabbro		Slow		Coarse
Basalt		Fast		Fine
Pumice	Lava		No Crystals	
Obsidian		Very Fast		Glassy
Granite	Magma		Large	