

## Igneous Intrusion

Hot molten magma from the Earth's crust reaches the surface through volcanic eruptions. Magma cools and hardens into igneous rock. **INTRUSIVE** igneous rock cools deep below the crust. The slow cooling produces coarse-grained rock with large crystals. **EXTRUSIVE** igneous rock cools quickly on the Earth's surface. Fast cooling produces fine-grained rock with small crystals or no crystals at all. Many igneous rocks contain a mixture of small and large mineral grains.

1. *Grain Strain*: Fill in Figures A and B with a combination of mineral grains and crystals. Use the description above to help you.



**A.** Intrusive Igneous Rock



**B.** Extrusive Igneous Rock

2. *Touch and Such*: Texture refers to how a rock looks and feels. Texture depends on the size, shape, and position of mineral grains in a rock. Write **INTRUSIVE** or **EXTRUSIVE** for each of the following texture descriptions.

- a. \_\_\_\_\_ large, broken crystals; coarse grains
- b. \_\_\_\_\_ glassy, smooth
- c. \_\_\_\_\_ porous, rough, lightweight
- d. \_\_\_\_\_ tiny crystals, heavy; fine grains

3. *Down and Up*: Granite is the most common intrusive igneous rock. The most abundant extrusive igneous rock is basalt. What minerals may be found in these rocks? Use the clues to reveal the minerals. Place the number of the mineral in each diagram below.

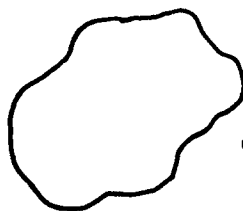
### Clues

**GRANITE**: four-lettered mineral;  
equals 2 pints+z; unscramble:  
caheorsotl

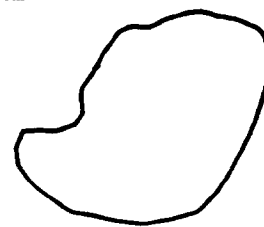
**BASALT**: letters 2, 3, and 4 mean  
"linger"; rhymes with scene;  
sounds like "rocks" in the middle

### Minerals

1. mica
2. olivine
3. orthoclase feldspar
4. plagioclase feldspar
5. pyroxine
6. quartz



**Granite**



**Basalt**

# Answer Key

## IGNEOUS INTRUSION

1. Diagrams will vary. Figure A should show coarse-grained particles mixed with large crystals. Figure B should show fine-grained particles with small crystals or no crystals present.
2. a. intrusive, b. extrusive, c. extrusive, d. extrusive
3. Granite: 1, 6, 3; Basalt: 4, 2, 5