IGNEOUS ROCKS
Forming Igneous Rocks

- Igneous rocks are formed from the cooling of liquid rock.
- Two things will determine which type of igneous rock
  - How fast it cools
  - Composition of melted rock
Magma vs. Lava

(fast cooled; fine grained)

EXTRUSIVE LAVA

VOLCANO

VEINS

INTRUSIVE GRANITE
(slow cooled, coarse grained)
Intrusive vs. Extrusive

- Igneous rocks can either form deep within the Earth or near/on the surface.

- **Intrusive** igneous rocks form **deep beneath the surface** and have been cooling for millions of years. These rocks are characterized by large crystals. Ex. Granite
Extrusive igneous rocks form on the surface of the earth. When lava erupts out of a volcano it cools rapidly and there is little to no crystal growth.
- Ex. Obsidian, pumice
Textures

- **Coarse-Grained**: Large crystals, slow cooling
- **Porphyritic**: Both large and small crystals, slow cooling with different minerals
- **Fine-Grained**: Small crystals, fast cooling
- **Glassy**: No crystals, instant cooling
SLOWEST

FASTEST
Composition

- The composition deals with the chemical make-up of the rock
Composition

- The composition deals with the chemical make-up of the rock (not Dwight Johnson)
Composition

Silicates are the most common minerals on earth.

How much silica does a rock have????

- **Felsic** (light)- rock made up mostly of silicates
  - over 65% silica
Composition

- Silicates are the most common minerals on earth.
  How much silica does a rock have????
  - **Andesitic** (medium)- rock that is half dark/light
    - between 55-65% silica
Composition

- Silicates are the most common minerals on earth.
  - How much silica does a rock have????
  - **Mafic** (dark)- rock that is rich in Fe and Mg
    - Between 45-55% silica
Composition

- Silicates are the most common minerals on earth.
  How much silica does a rock have????
  - **Ultramafic** - rocks rich in Fe and Mg
    - Under 45% silica