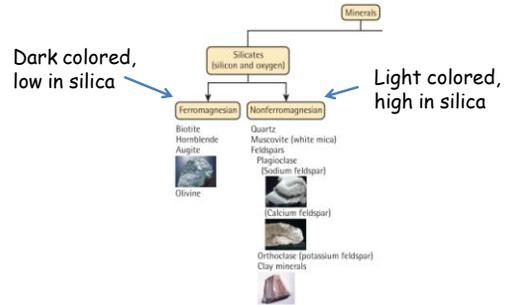


Igneous Rocks and Magmas

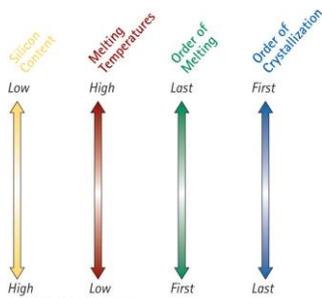
GS 106

Silicate minerals crystallize from magmas



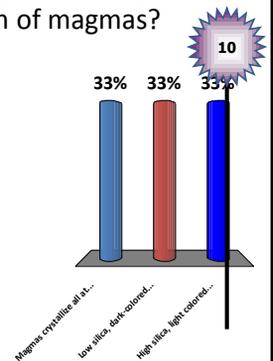
Crystallization from a magma

Notice the relationship between silica and order of crystallization



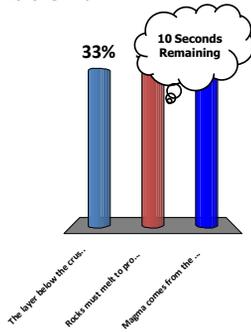
Which of the following is TRUE regarding the crystallization of magmas?

1. Magmas crystallize all at once
- ✓ 2. Low silica, dark-colored minerals crystallize first
3. High silica, light colored minerals crystallize first



Which of the following is correct about magma formation?

1. The layer below the crust, the mantle, is always molten and therefore always is magma
2. Rocks must melt to produce magma
3. Magma comes from the outer core and erupts on the surface



Igneous rocks



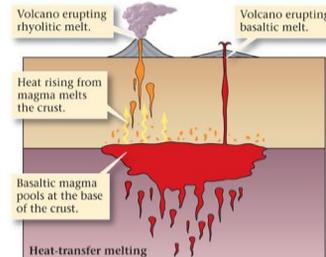
Sources of internal heat

- Impact heating
- Differentiation
- Decay of radioactive minerals



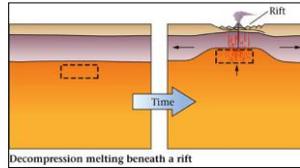
How is magma produced?

1) Increasing heat



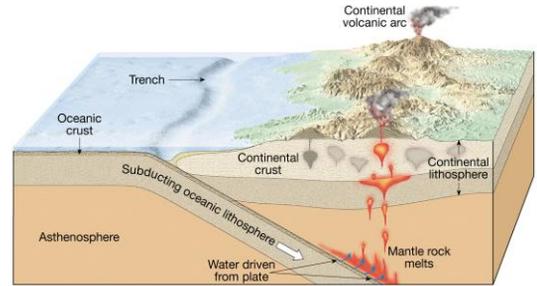
How is magma produced?

2) Lowering pressure



How is magma produced?

3) Adding water



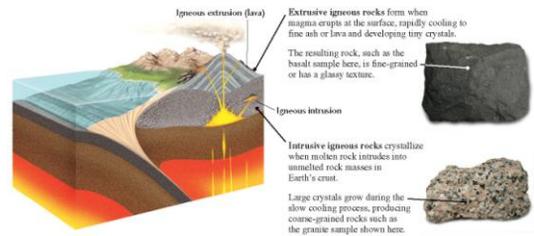
Magma types

Type	Silica content	Viscosity
Felsic (granitic)	High	Very High: Explosive eruptions.
Intermediate (andesitic)	Intermediate	High: Explosive eruptions.
Mafic (basaltic)	Low	Low: thin, hot runny eruptions.

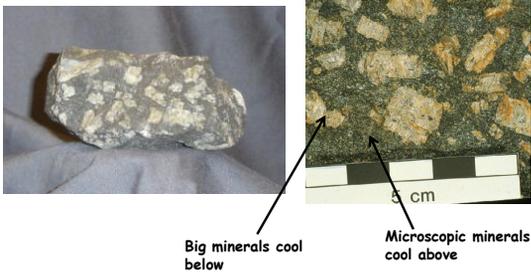


IGNEOUS ROCKS: formed by the solidification of magma

- Extrusive: cool above ground (tiny crystals)
- Intrusive: cool below ground (large crystals)



Porphyritic igneous rocks



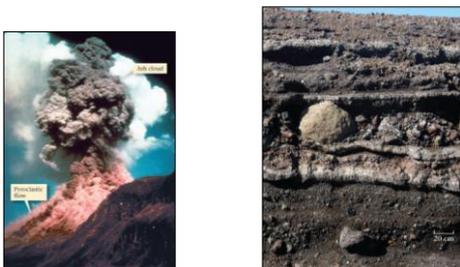
Big minerals cool below

Microscopic minerals cool above

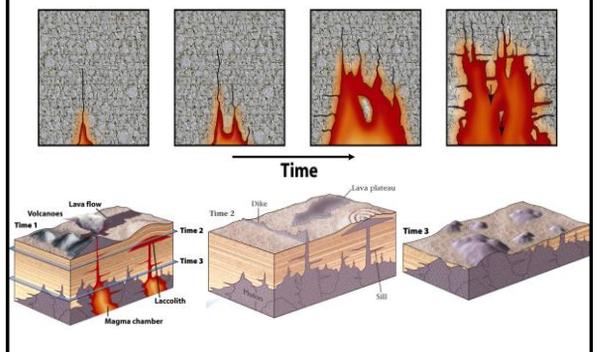
Extrusive igneous settings



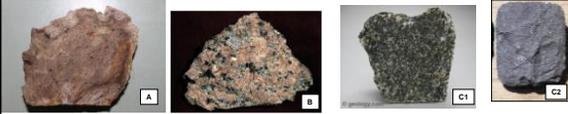
Extrusive igneous settings



Intrusive igneous settings



Identifying igneous rocks



Type	Fine-grained	Coarse-grained
Felsic	Rhyolite <input type="checkbox"/> A	Granite <input type="checkbox"/> B
Intermediate	Andesite	Diorite
Mafic	Basalt <input type="checkbox"/> C2	Gabbro <input type="checkbox"/> C1

Obsidian and pumice

Vesicles: cooled
gas bubbles

