Igneous Rock Characterization and Identification – LECTURE

To identify (name) igneous rocks, you determine two things about the rock: composition and texture. First determine composition, which is based on mineral content or color, if you can't see minerals. Then determine the texture of the rock and based on the two, identify the rock name.

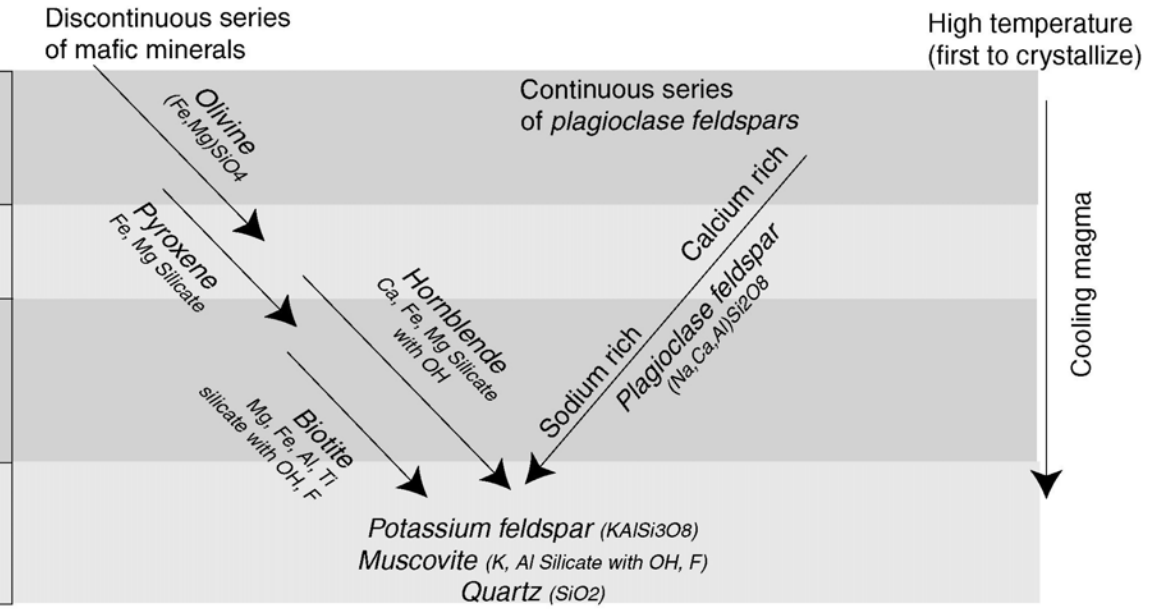
Composition									
Quartz	**Potassium Feldspar**	**Muscovite**	**Biotite**	**Hornblende**	**Plagioclase**	**Pyroxene**	**Olivine**	**Color index (if can't see minerals)**	**Compositional name**
0	0	0	0	0	0-20%	0-20%	50-100%	Very dark	*Ultramafic*
0	0	0	0	0-10%	20-60%	25-30%	0-50%	Dark	*Mafic*
0	0	0	0-5%	10-20%	10-60%	0-10%	0	Grey (medium dark)	*Intermediate*
10-30%	0-50%	0-5%	0-5%	0-10%	10%	0	0	Very light to salt and pepper colored (can contain a lot of pink)	*Felsic*

	Texture				
	Phaneritic 100% visible crystals	**Aphanitic** Most crystals too small to see	**Glassy** 100% glass	**Frothy** Greater than 50% vesicles (rest is usually glass-like)	**Pyroclastic** Fragments of ash, crystals, pumice, rocks
Ultramafic	*Peridotite*				
Mafic	*Gabbro*	*Basalt*		*Scoria*	*Volcanic Tuff*
Intermediate	*Diorite*	*Andesite*		*Pumice*	*Volcanic Tuff*
Felsic	*Granite*	*Rhyolite*	*Obsidian*	*Pumice*	*Volcanic Tuff*
	Pegmatitic texture is a subcategory of Phaneritic	*Porphyritic texture is a subcategory of Aphanitic*			

(Ultramafic rocks are similar to mantle rocks. They are rare, and no sample exists for the lecture activity.)

Bowen's Reaction Series

COMPOSITION NAME	EXTRUSIVE OR VOLCANIC ROCK NAME	INTRUSIVE OR PLUTONIC ROCK NAME
Ultramafic		*Peridotite*
Mafic	*Basalt*	*Gabbro*
Intermediate	*Andesite*	*Diorite*
Felsic	*Rhyolite*	*Granite*



Example: A mafic rock contains pyroxene and plagioclase and possibly small amounts of olivine. If a mafic rock is volcanic, we call it basalt. If it is plutonic, we call it gabbro.