REGENTS EARTH SCIENCE
Igneous Rock Identification

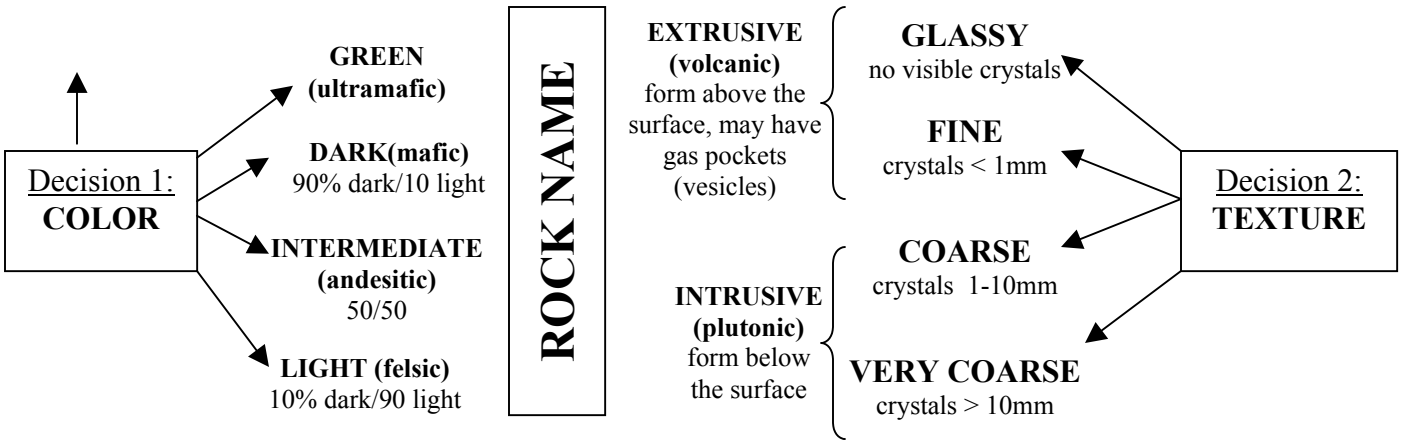
Name: _____

As you now know, rocks are composed of minerals or a combination of minerals. Rocks are categorized into types based on the way in which they form. Igneous rocks form as molten, mineral-rich material cools (or, you might say, "freezes") as it rises toward earth's surface. Igneous rocks are classified based on two main characteristics- ***mineral composition*** and ***mineral grain size (texture)***. These characteristics, in turn, signify a particular ***environment of formation***. Herein lies the key: **if you know the rock, you know the past environment!** Remember, rocks form the sentences and paragraphs of earth's language. Using your senses and the **Scheme for Igneous Rock Identification** found in your reference tables, you will be able to first classify then identify the environment of formation of a variety of different igneous rocks.

PROCEDURE

First, take some time to familiarize yourself with the ***flow*** of the identification chart. The chart is read by "plotting" two major physical characteristics- **color** and **texture**. The outline below may be helpful as a guide:

Although color is a poor Indicator for minerals, igneous rocks are typically composed of a combination of 7 major minerals with specific coloration. As a result, color turns out to be very useful for identifying composition.



Environments of Formation

The **composition** and **density** of igneous rocks determine *where* they are formed on the earth. As you already know, **plutonic** rocks form below the surface (big crystals), while **volcanic** rocks form at or above the surface (fine or glassy texture).

Low Density/Light Color ⟷ High Density/Dark Color
Felsic — Mafic/Ultra Mafic

CONTINENTAL
Rocks form at the surface or beneath the surface of the Land (continent).

INTERMEDIATE
Rocks form where ocean crust and continent crust meet or collide (Andes Mtns)

OCEANIC
Rocks form in the ocean or beneath the ocean crust.

MANTLE
Rocks form in the mantle

Scheme for Igneous Rock Identification

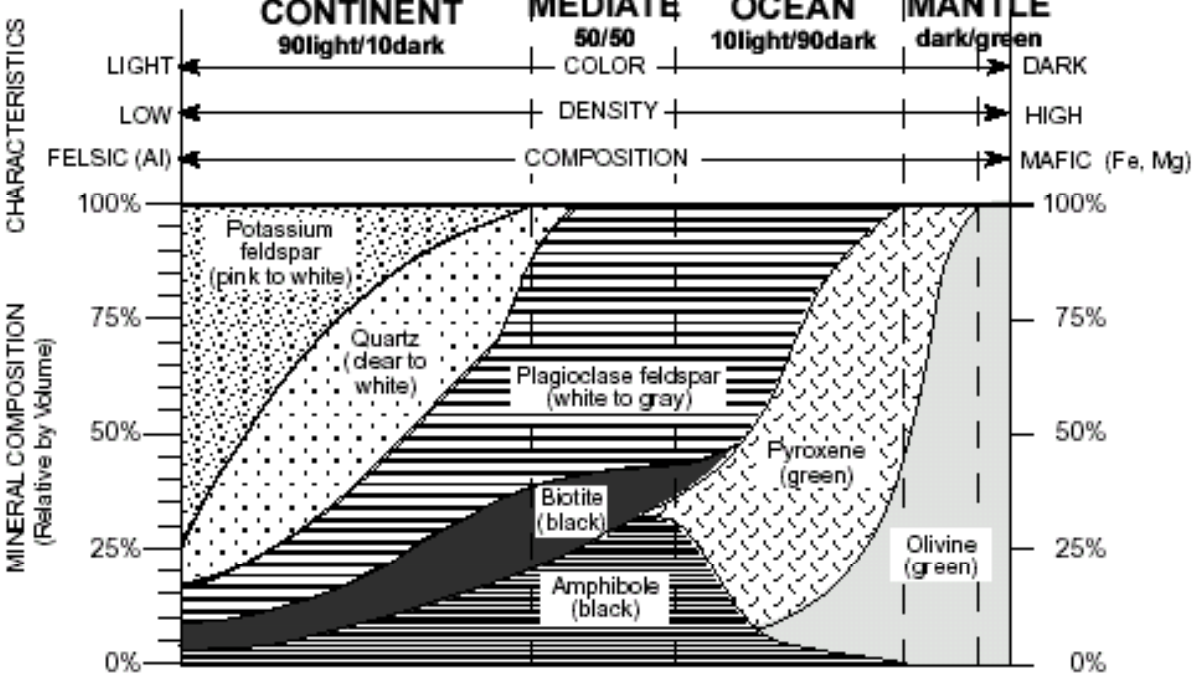
IGNEOUS ROCKS

ENVIRONMENT OF FORMATION						GRAIN SIZE	TEXTURE	
EXTRUSIVE (Volcanic)		Obsidian (usually appears black)		Basaltic Glass		Non-crystalline	Glassy	Non-vesicular
		Pumice		Vesicular Basaltic Glass				Vesicular (gas pockets)
		Vesicular Rhyolite	Vesicular Andesite	Scoria / Vesicular Basalt		less than 1 mm	Fine	
		Rhyolite	Andesite	Basalt				
INTRUSIVE (Plutonic)		Granite	Diorite	Gabbro	Peridotite / Dunite	1 mm to 10 mm	Coarse	Non-vesicular
		Pegmatite				10 mm or larger	Very Coarse	

CHARACTERISTICS

CONTINENT	INTERMEDIATE	OCEAN	MANTLE
90light/10dark	50/50	10light/90dark	dark/green
LIGHT	COLOR		DARK
LOW	DENSITY		HIGH
FELSIC (Al)	COMPOSITION		MAFIC (Fe, Mg)

MINERAL COMPOSITION (Relative by Volume)



COMPLETE THE CHART ON THE BACK USING THIS SCHEME AND YOUR OBSERVATIONS

Name: _____ SCORE: _____ /20

ROCK TYPE	COLOR (Dark w/green, Dark, Intermediate, Light)	TEXTURE (Glassy, Fine, Coarse, Very Coarse, Vesicular/Non)	ROCK NAME	INTRUSIVE or EXTRUSIVE	ENVIRONMENT (Mantle, Ocean, Intermediate, Continental)
1. Igneous					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					