REGENTS EARTH SCIENCE
Metamorphic Rock ID Lab

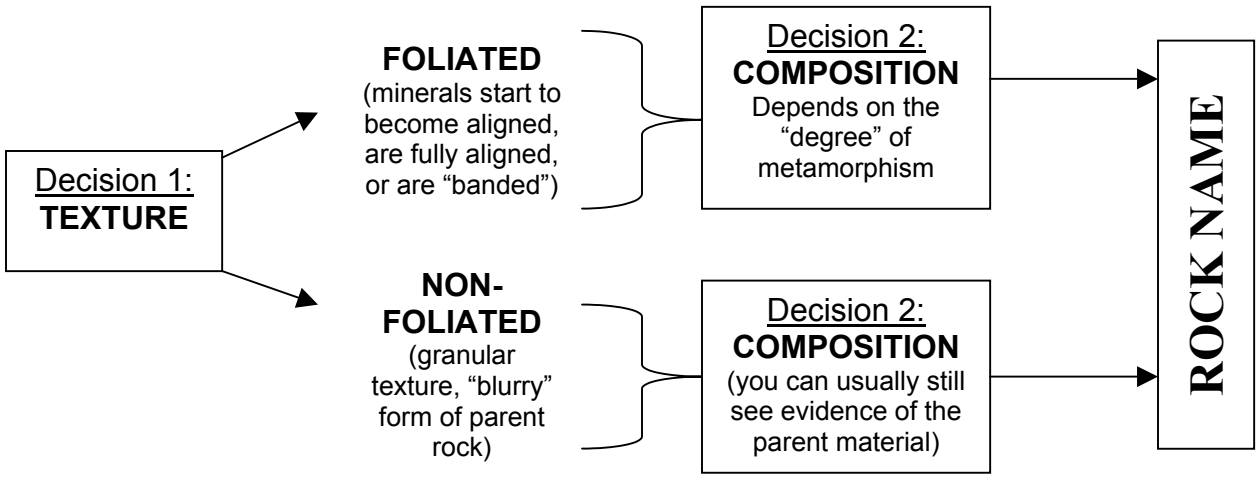
Name: _____

And last but not least, **METAMORPHIC ROCKS**! By now, you must realize that rocks are categorized into types based on the way in which they form. ***Metamorphic*** rocks form just that way- by **changing (*meta=* *to change*) form (*morph=* *form*)**. These rocks start out as igneous or sedimentary rocks (or metamorphic) and are altered or rearranged by a combination of **heat** and **pressure**. Simply put, metamorphism occurs when a previously existing rock, the ***parent rock***, is buried in the earth under layers of other rock. The deeper the rock is buried the hotter it gets, and the higher the pressure becomes. Eventually, the rock must adjust to the conditions of this *new* environment. You might think of the rock as being *baked*, *squeezed*, or both, and in the process becomes a metamorphic rock.

Metamorphic rocks are classified in a similar manner to the other rock types- start with ***texture***. Once you have decided whether layering is present or not, you must evaluate the **composition**. Remember, **if you know the rock, you know the past environment!** Using your senses and the **Scheme for Metamorphic Rock Identification**, you will be able to first classify and identify the rocks and their environments of formation.

PROCEDURE

First, take some time to familiarize yourself with the ***flow*** of the identification chart. The chart is read by deciding on the **texture** first. The outline below may be helpful as a guide:



The **texture** and **composition** of igneous rocks are determined by their *degree of metamorphism*. Depending on the influence of heat/pressure, metamorphic rocks may form as:

1. New mineral compositions, some typical of igneous rocks and some unique to metamorphic rocks.

2. New textures unique to metamorphic rocks.

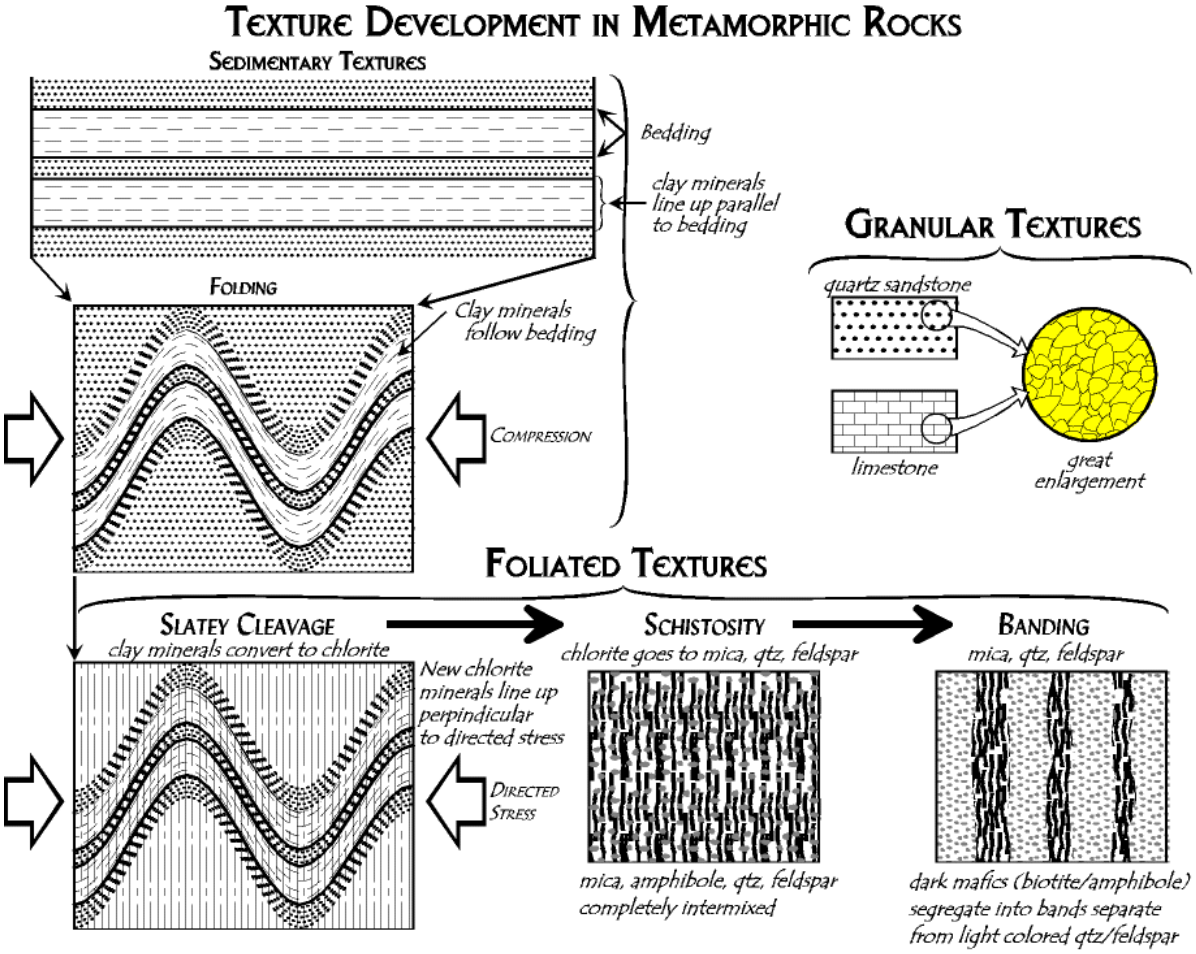


Diagram from Department of Geology/Environmental Science James Madison University

Scheme for Metamorphic Rock Identification

TEXTURE	GRAIN SIZE	COMPOSITION	TYPE OF METAMORPHISM	COMMENTS	ROCK NAME	MAP SYMBOL
FOLIATED – MINERAL ALIGNMENT	Fine	MICA, QUARTZ, FELDSPAR, AMPHIBOLE, GARNET, PYROXENE	Regional (Heat and pressure increase with depth)	Low-grade metamorphism of shale	Slate	
FOLIATED – MINERAL ALIGNMENT	Fine to medium	MICA, QUARTZ, FELDSPAR, AMPHIBOLE, GARNET, PYROXENE	Regional (Heat and pressure increase with depth)	Foliation surfaces shiny from microscopic mica crystals	Phyllite	
FOLIATED – MINERAL ALIGNMENT	Fine to medium	MICA, QUARTZ, FELDSPAR, AMPHIBOLE, GARNET, PYROXENE	Regional (Heat and pressure increase with depth)	Platy mica crystals visible from metamorphism of clay or feldspars	Schist	
FOLIATED – BANDING	Medium to coarse	MICA, QUARTZ, FELDSPAR, AMPHIBOLE, GARNET, PYROXENE	Regional (Heat and pressure increase with depth)	High-grade metamorphism; some mica changed to feldspar; segregated by mineral type into bands	Gneiss	
NONFOLIATED	Fine	Variable	Contact (Heat)	Various rocks changed by heat from nearby magma/lava	Hornfels	
NONFOLIATED	Fine to coarse	Quartz	Regional or Contact	Metamorphism of quartz sandstone	Quartzite	
NONFOLIATED	Fine to coarse	Calcite and/or dolomite	Regional or Contact	Metamorphism of limestone or dolostone	Marble	
NONFOLIATED	Coarse	Various minerals in particles and matrix	Regional or Contact	Pebbles may be distorted or stretched	Metaconglomerate	

Name: _____ SCORE: _____ /20

COMPLETE THE CHART USING THIS SCHEME AND YOUR OBSERVATIONS!

ROCK TYPE	**TEXTURE** (FOLIATED or NON-FOLIATED)	**COMPOSITION**	**ROCK NAME**	**PARENT**	**ENVIRONMENT** (original, squeezed or heated)
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					