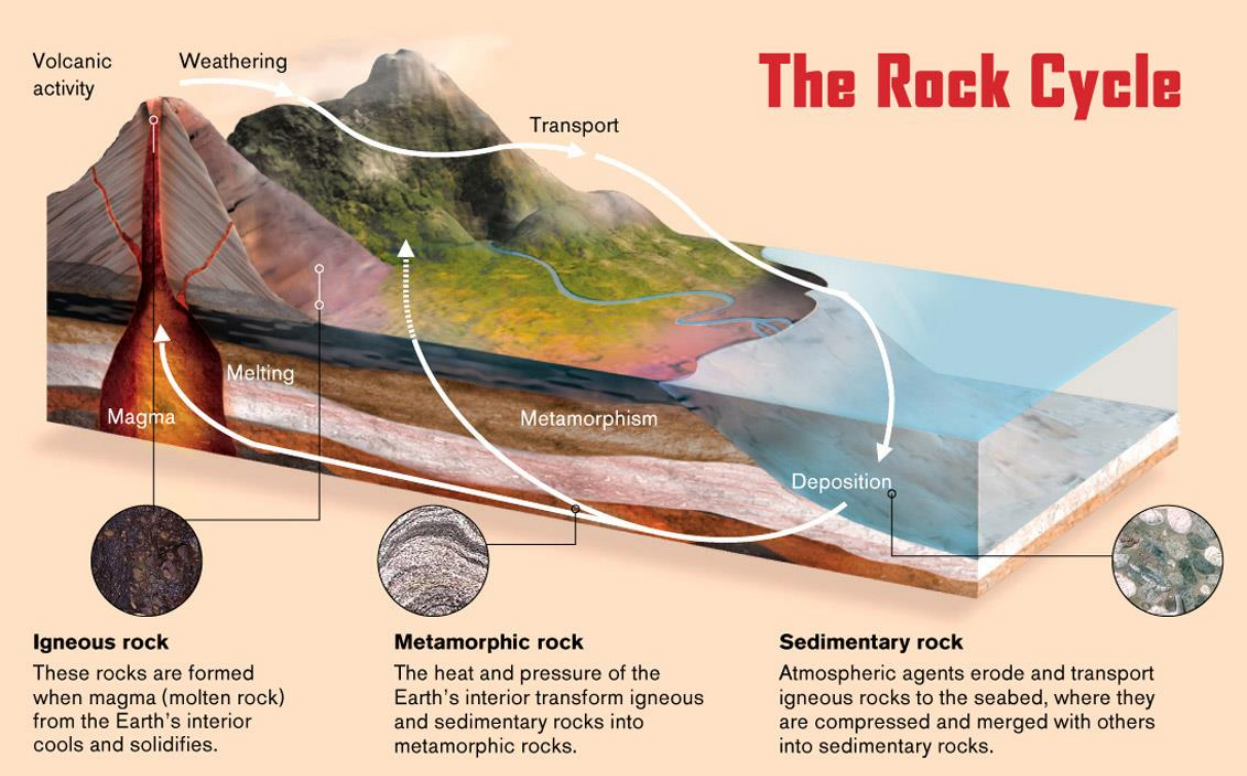
Name:
Date:

Earth Science 11: Metamorphic Rocks

Textbook Pages: 66-71



Metamorphism: when a rock encounters physical or chemical conditions significantly different from those it formed in.

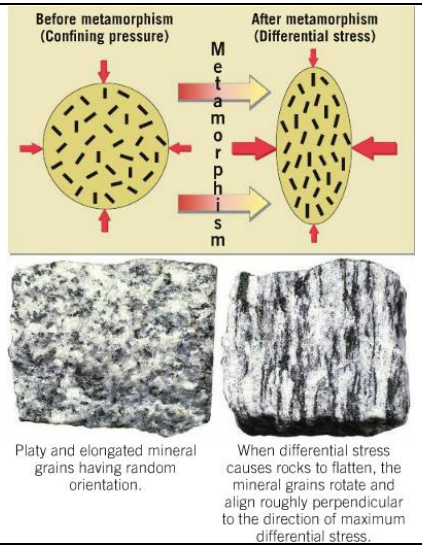
- the rock changes state until an equilibrium with the new environment is reached.

Metamorphism causes changes in:

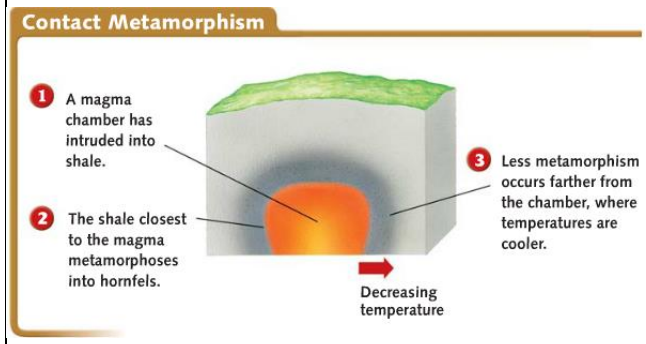
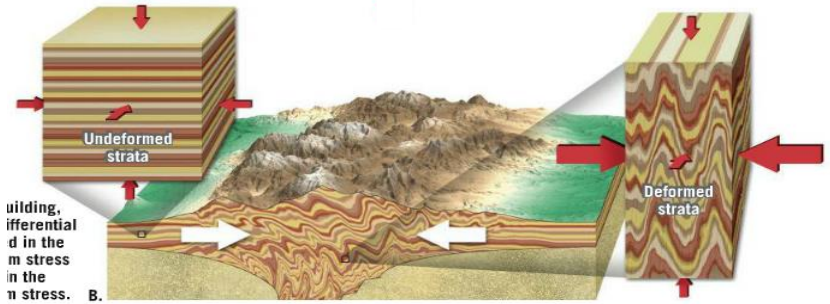
- rock texture (grain size)
- chemical composition (the minerals present)
- internal structure (density and porosity).

Name:
Date:

Causes of Metamorphism

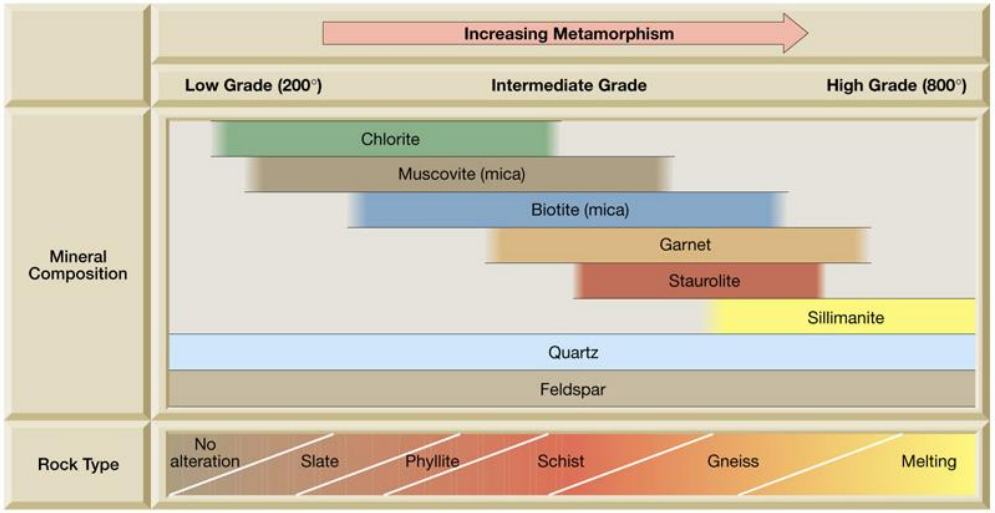
Heat	Increase in temperature causes recrystallization (transformation of existing minerals into new minerals	**What are two sources of heat inside earth?** **Igneous intrusions and geothermal gradient (temp increases as you move towards the core)**
Confining and Differential Pressure	**Confining:** pressure equal in all directions **Differential:** pressure is not equal in all directions (minerals will be stretched perpendicular to the direction of greatest stretch – causes foliation)	
Chemically active fluids	Iron rich fluids	

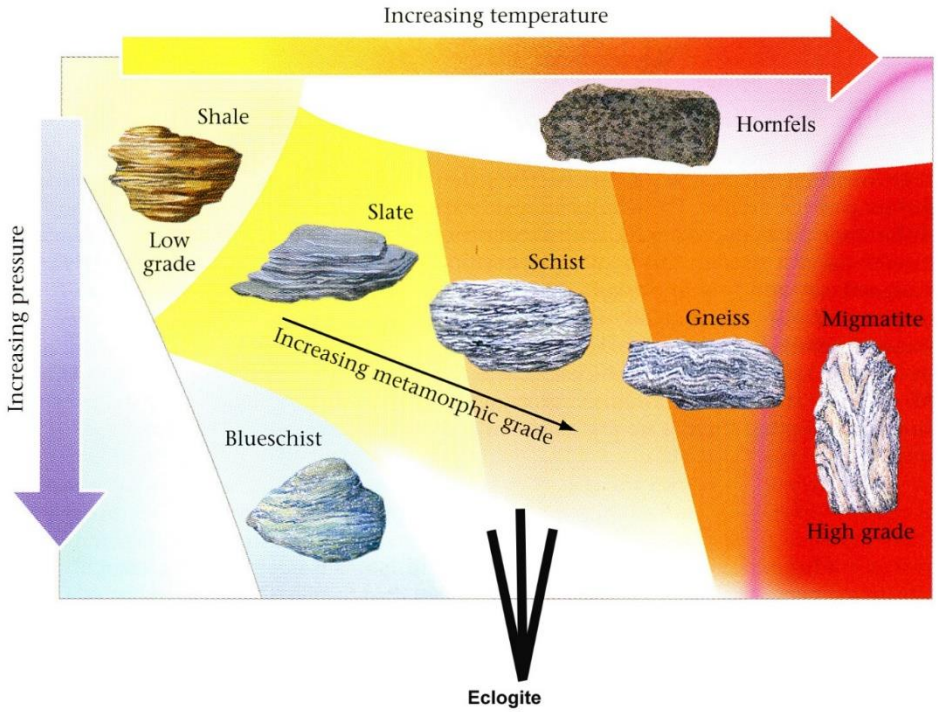
Types of Metamorphism

Contact	Regional
Covers a small area and is caused by an increase in heat, typically from an igneous intrusion.	Covers a large area and is caused by an increase in heat and pressure, typically from a convergent plate boundary.
	

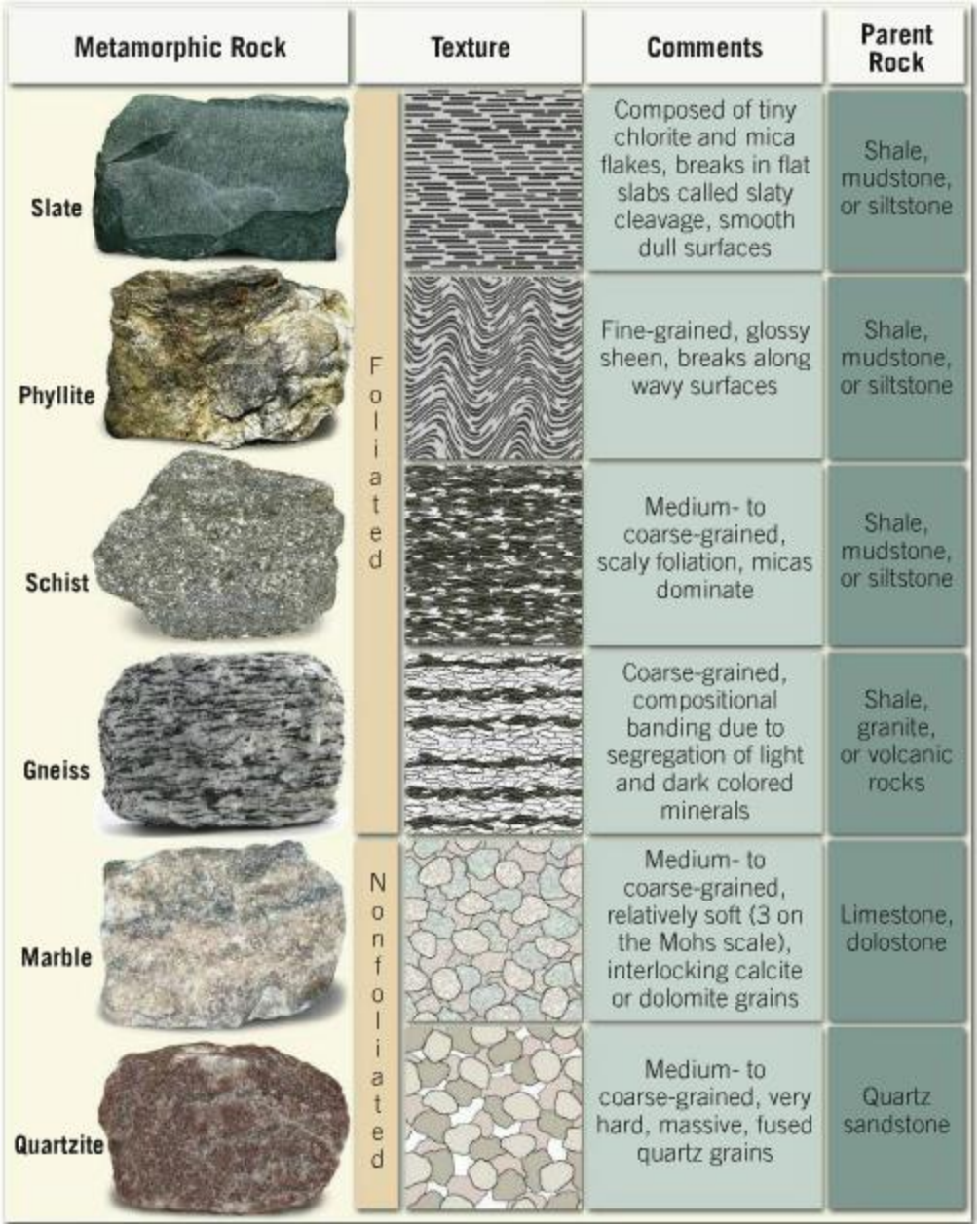
Metamorphic Grade

- describes the degree to which a rock has undergone metamorphism. This is indication by index minerals which only form under specific temperature and pressure ranges.





Metamorphic Rock Identification



Metamorphic Rock	Texture	Comments	Parent Rock
Slate	Foliated	Composed of tiny chlorite and mica flakes, breaks in flat slabs called slaty cleavage, smooth dull surfaces	Shale, mudstone, or siltstone
Phyllite	Foliated	Fine-grained, glossy sheen, breaks along wavy surfaces	Shale, mudstone, or siltstone
Schist	Foliated	Medium- to coarse-grained, scaly foliation, micas dominate	Shale, mudstone, or siltstone
Gneiss	Foliated	Coarse-grained, compositional banding due to segregation of light and dark colored minerals	Shale, granite, or volcanic rocks
Marble	Nonfoliated	Medium- to coarse-grained, relatively soft (3 on the Mohs scale), interlocking calcite or dolomite grains	Limestone, dolostone
Quartzite	Nonfoliated	Medium- to coarse-grained, very hard, massive, fused quartz grains	Quartz sandstone

- The Descriptions and identifications of metamorphic rocks are based on the parent rock, mineral content and texture (foliated or non-foliated).

*Complete Activity ** (pg.)in your workbook