

The Rock Cycle

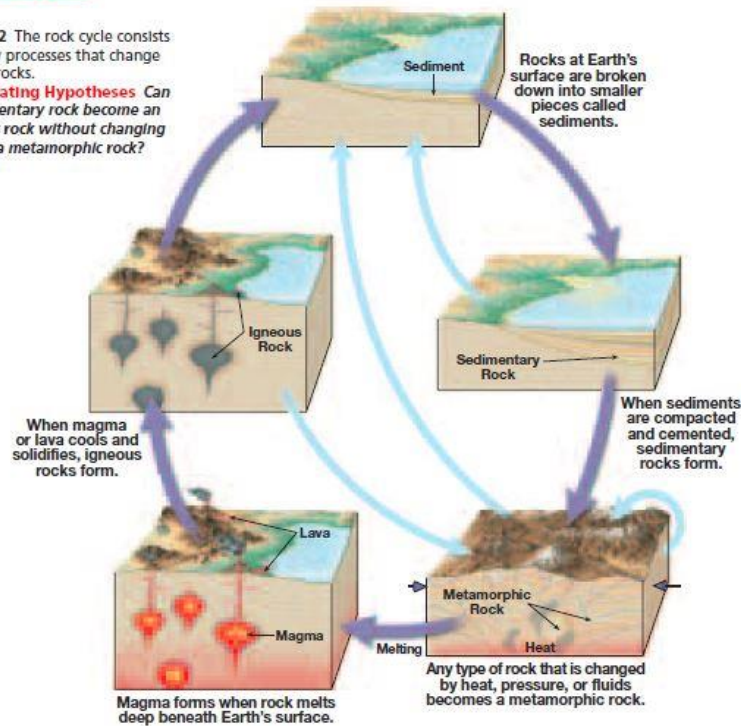
Igneous, Sedimentary, & Metamorphic Rocks

The Rock Cycle:

Rock Cycle

Figure 2 The rock cycle consists of many processes that change Earth's rocks.

Formulating Hypotheses Can a sedimentary rock become an igneous rock without changing first to a metamorphic rock? Explain.



Igneous Rocks:

Table 1 Classification of Major Igneous Rocks

Chemical Composition		Granitic	Andesitic	Basaltic	Ultramafic	
Dominant Minerals		Quartz Potassium feldspar Sodium-rich plagioclase feldspar	Amphibole Sodium- and calcium-rich plagioclase feldspar	Pyroxene Calcium-rich plagioclase feldspar	Olivine Pyroxene	
TEXTURE	Coarse-grained		Granite	Diorite	Gabbro	Peridotite
	Fine-grained		Rhyolite	Andesite	Basalt	Komatiite (rare)
	Porphyritic		"Porphyritic" precedes any of the above names whenever there are appreciable phenocrysts.			Uncommon
	Glassy		Obsidian (compact glass) Pumice (frothy glass)			
Rock Color (based on % of dark minerals)		0% to 25%	25% to 45%	45% to 85%	85% to 100%	

Sedimentary Rocks:

Table 2 Classification of Major Sedimentary Rocks

Clastic Sedimentary Rocks				Chemical Sedimentary Rocks			
Texture (grain size)	Sediment Name	Rock Name	Composition	Texture (grain size)	Rock Name		
Coarse (over 2 mm)	Gravel (rounded fragments)	Conglomerate	Calcite, CaCO ₃	Fine to coarse crystalline	Crystalline Limestone		
	Gravel (angular fragments)	Breccia			Travertine		
Medium (1/16 to 2 mm)	Sand	Sandstone		Visible shells and shell fragments loosely cemented	Coquina	Bioclastic	
					Mud		Siltstone
Very fine (less than 1/256 mm)	Mud	Shale					
					Quartz, SiO ₂		Very fine crystalline
				Gypsum CaSO ₄ •2H ₂ O	Fine to coarse crystalline	Rock Gypsum	
				Halite, NaCl	Fine to coarse crystalline	Rock Salt	
				Altered plant fragments	Fine-grained organic matter	Bituminous Coal	

Metamorphic Rock:

Table 3 Classification of Major Metamorphic Rocks

Rock Name	Texture	Grain Size	Comments	Parent Rock
Slate	Foliated	Very fine	Smooth dull surfaces	Shale, mudstone, or siltstone
Phyllite		Fine	Breaks along wavy surfaces, glossy sheen	Slate
Schist		Medium to Coarse	Micaceous minerals dominate	Phyllite
Gneiss		Medium to Coarse	Banding of minerals	Schist, granite, or volcanic rocks
Marble	Nonfoliated	Medium to coarse	Interlocking calcite or dolomite grains	Limestone, dolostone
Quartzite		Medium to coarse	Fused quartz grains, massive, very hard	Quartz sandstone
Anthracite		Fine	Shiny black organic rock that fractures	Bituminous coal