

Applied Rock Mechanics

Lecture 1

How do we look at rocks from an engineering point of view?

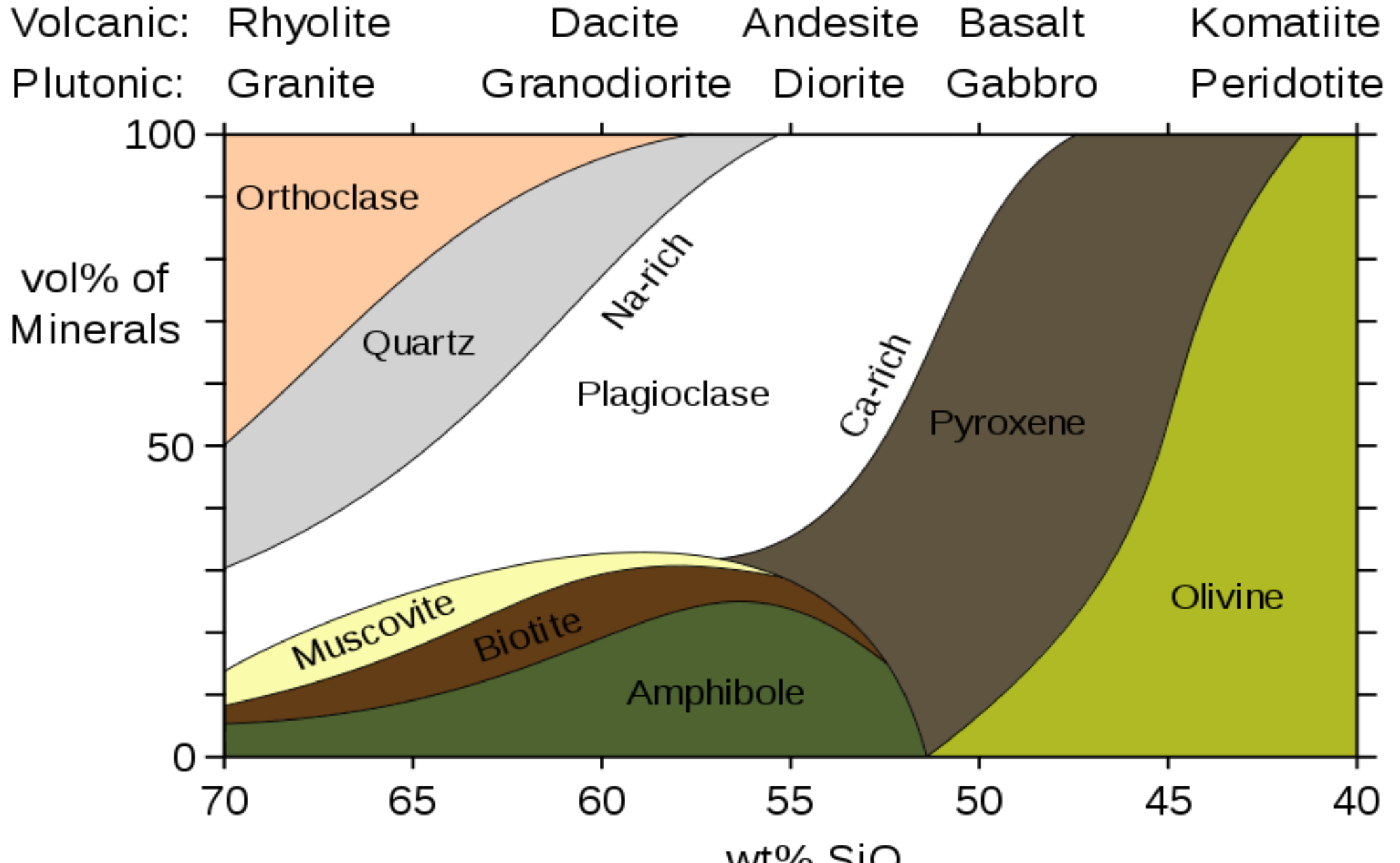
Dr. Azealdeen Salih Al-Jawadi

Department of Mining Engineering

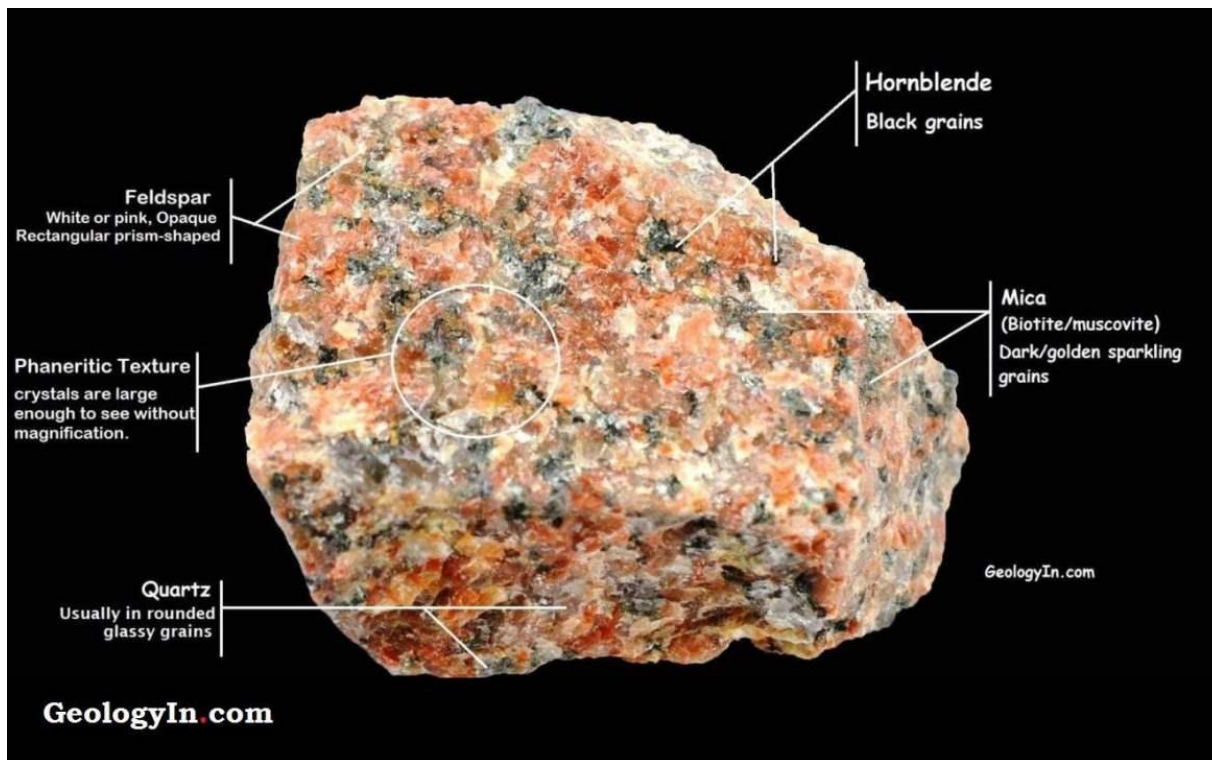
College of Petroleum and Mining Engineering

University of Mosul

Igneous rocks



Granite



Rhyolite





Basalt



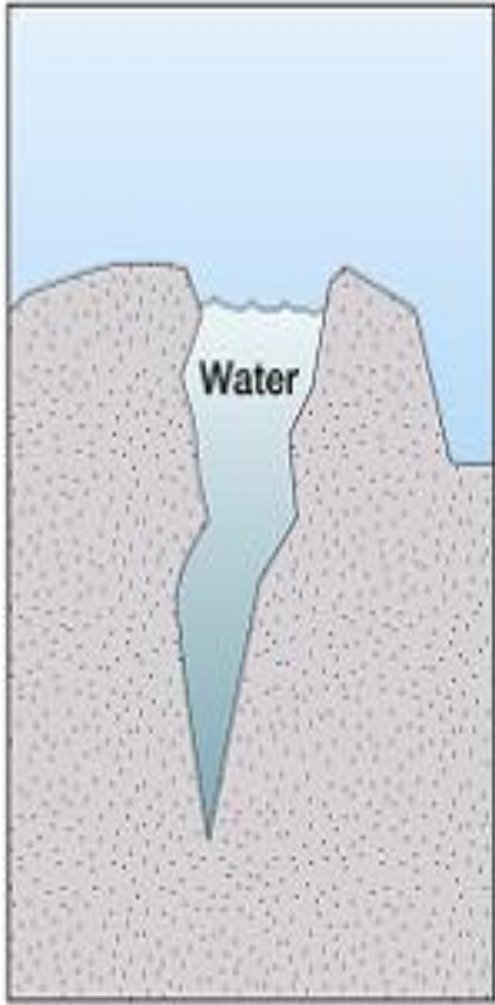
Gabbro

Sedimentary rocks

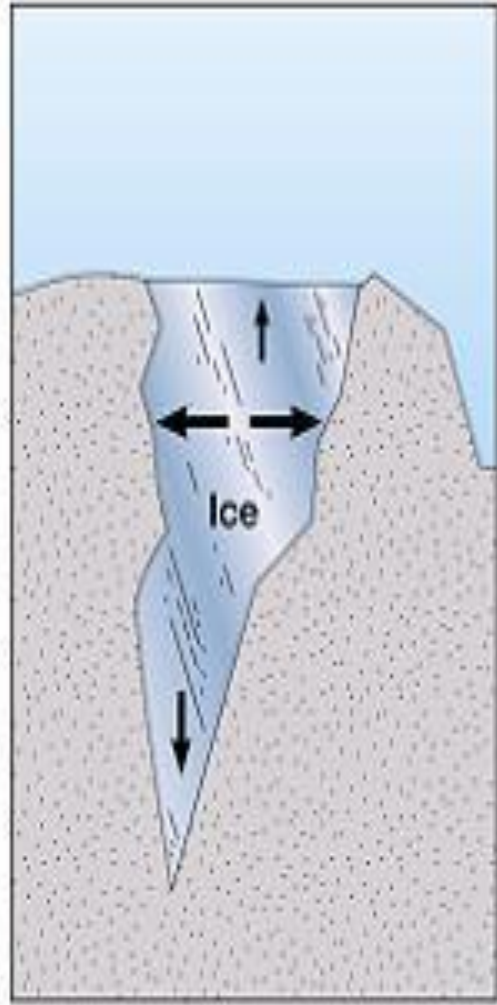
WEATHERING AND EROSION





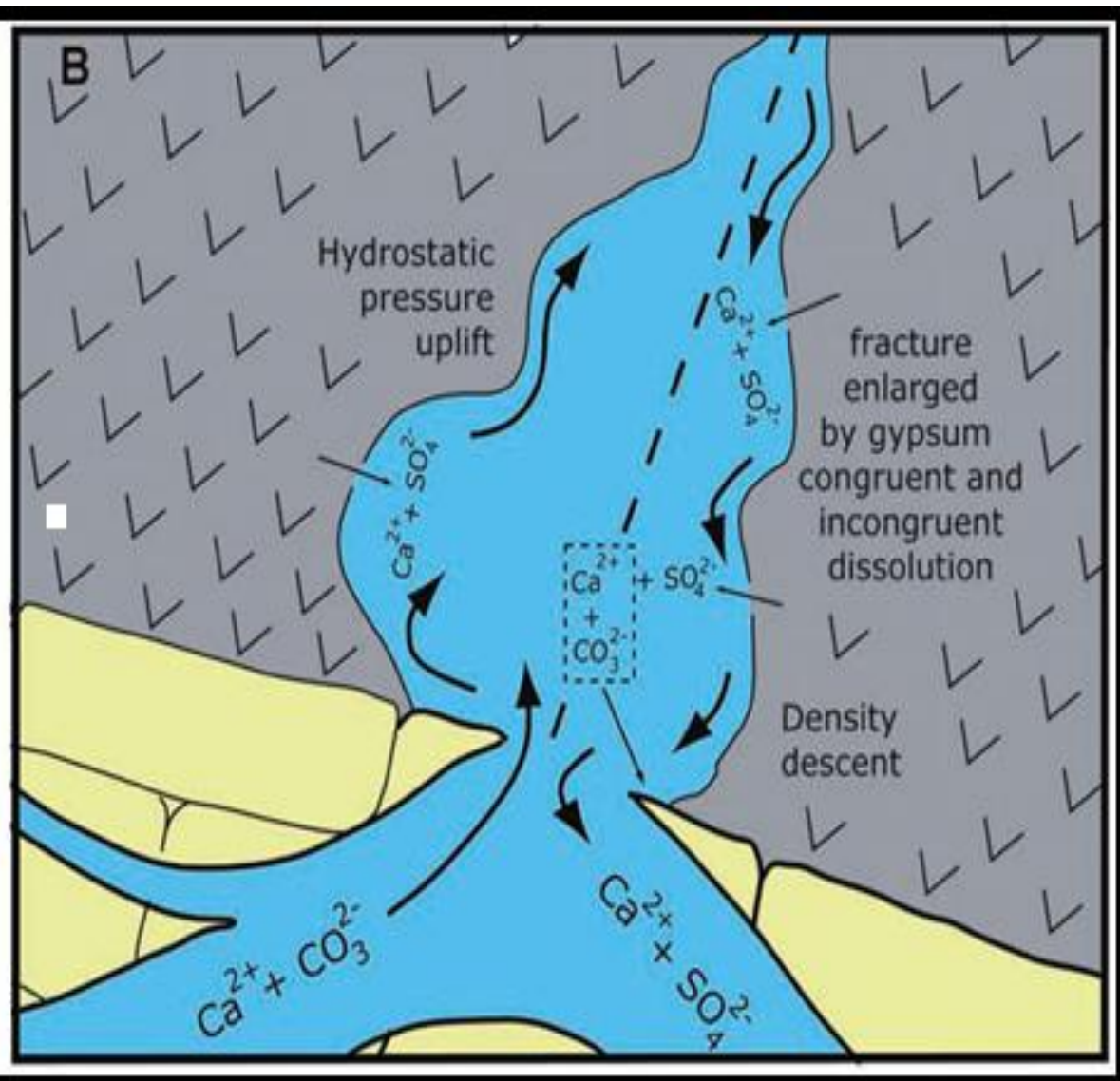
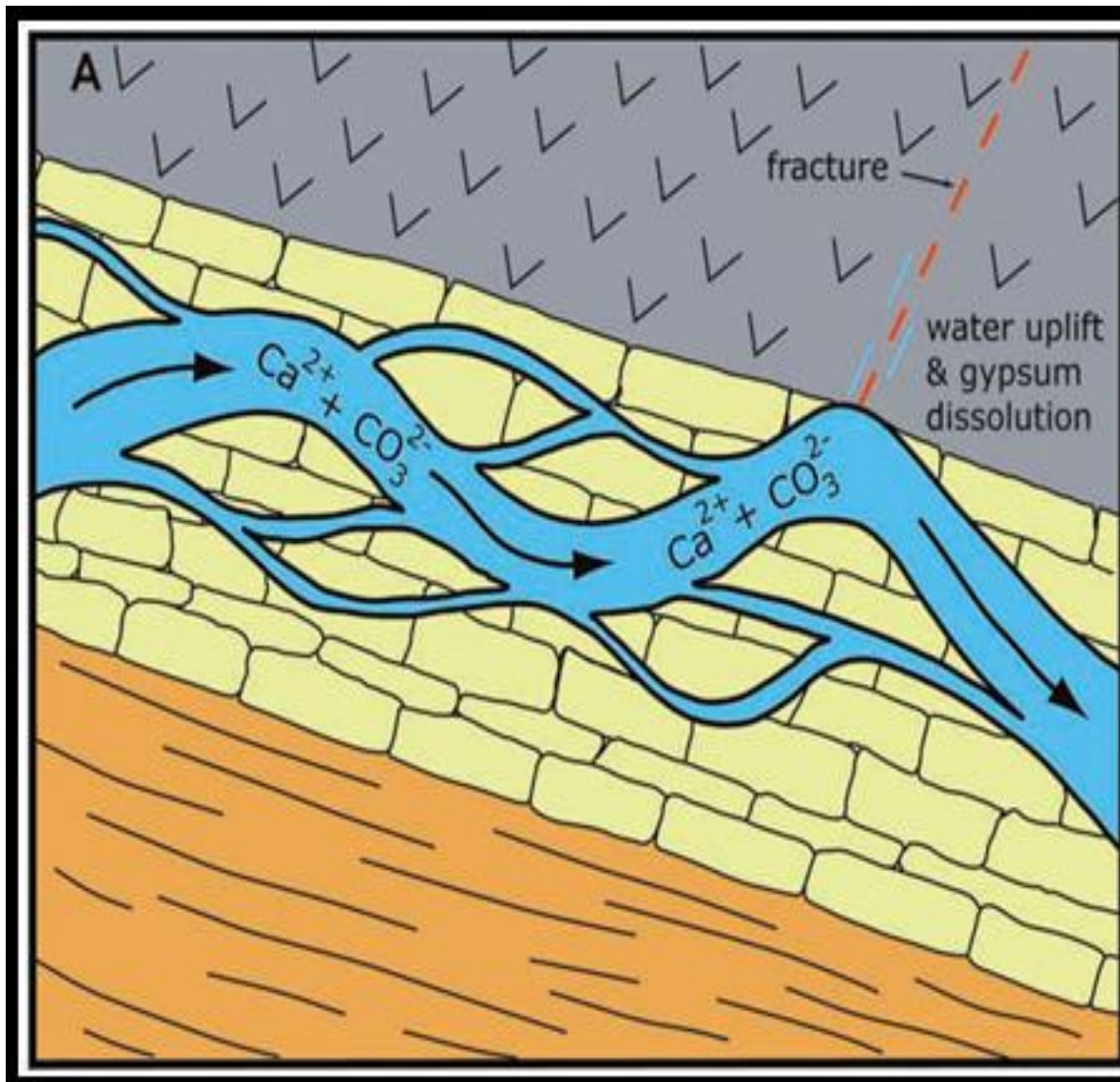


(a)

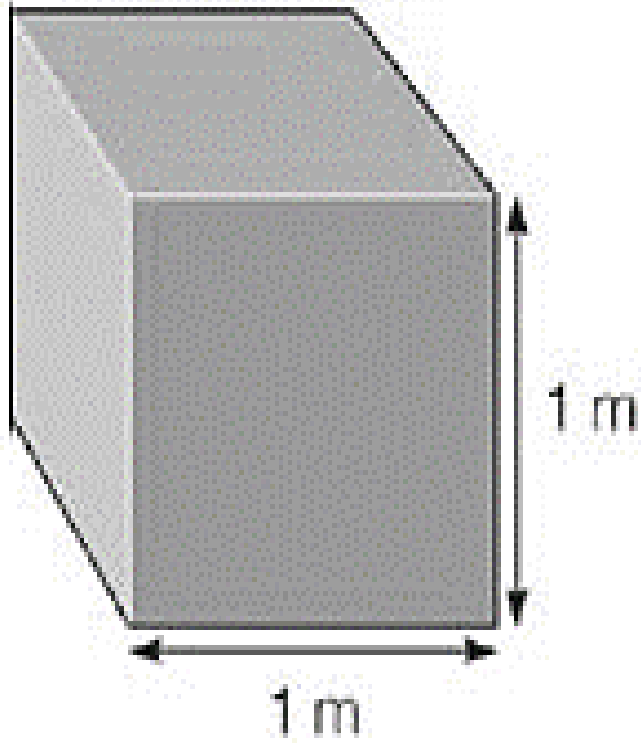


(b)

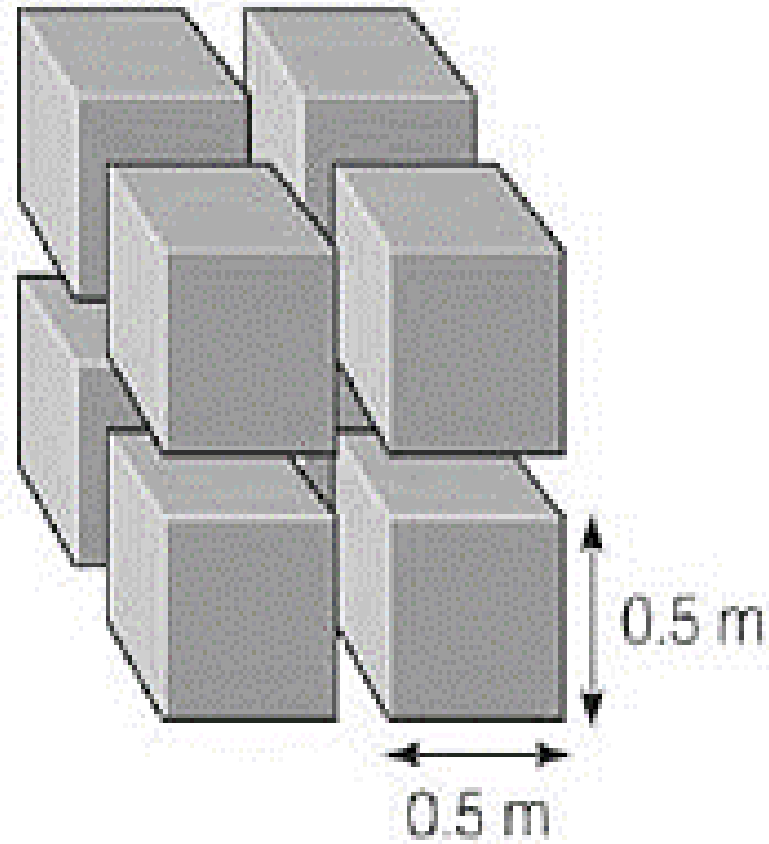




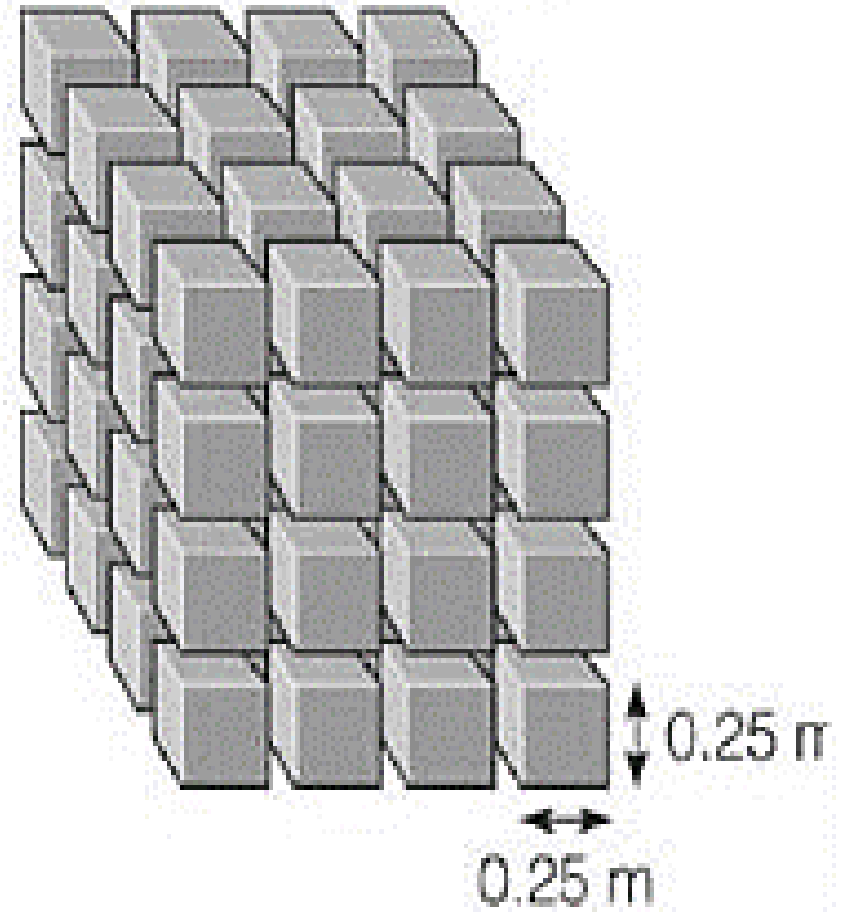
Surface area = 6 m^2



Surface area = 12 m^2

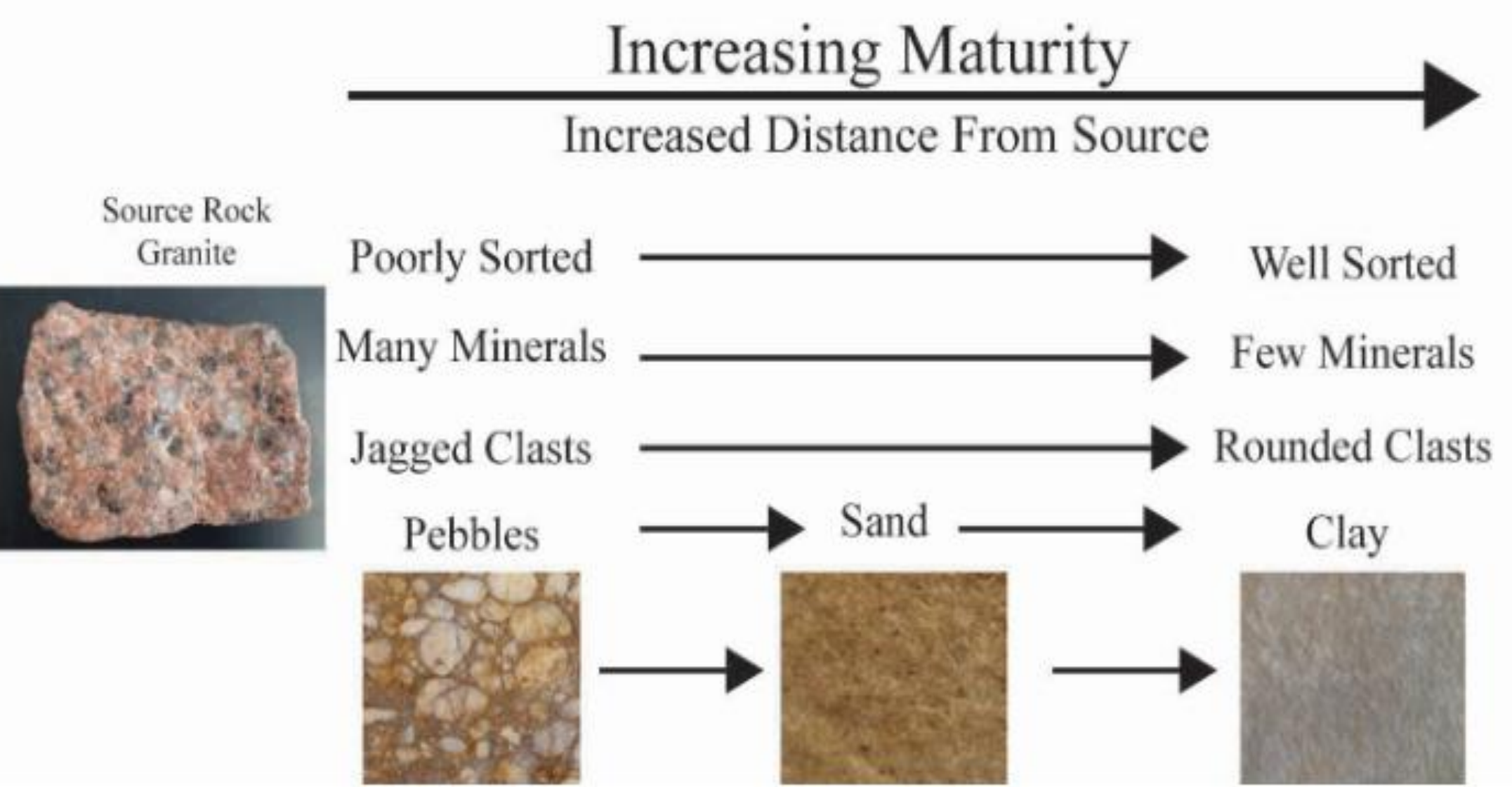


Surface area = 24 m^2



COMMON SEDIMENTARY ROCKS

CLASTIC SEDIMENTARY ROCKS







CLASTIC SEDIMENTARY ROCKS

Composition






Texture and Properties

Detrital Sedimentary Rocks

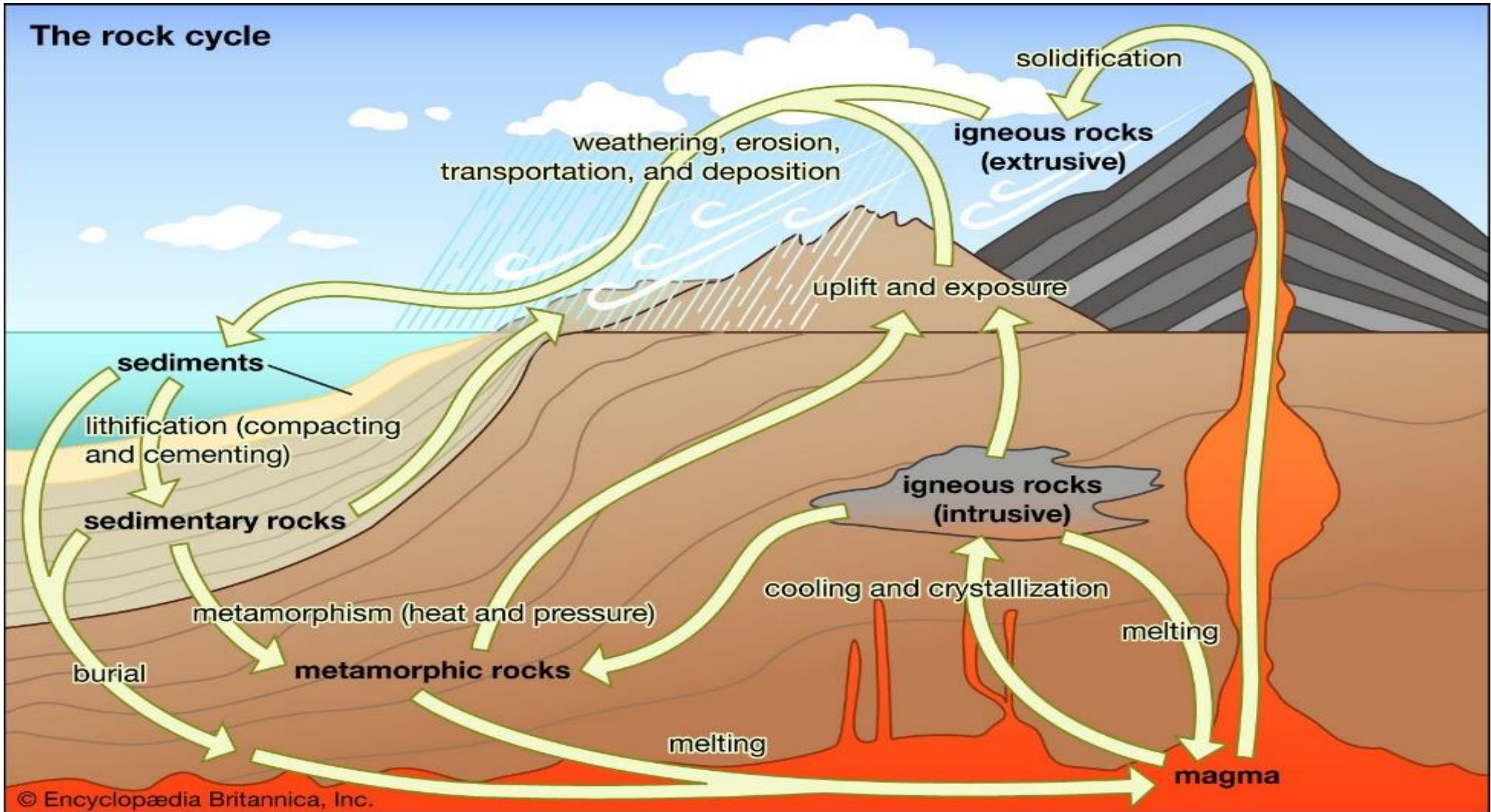
	Composition	Texture and Properties	
Shale	Fine rock fragments smaller than 1/16 mm	Clay-sized particles that cannot be differentiated by the naked eye. May be fissile, splits into distinctive layers	
Sandstone	Medium rock fragments between 1/16 mm and 2 mm	Composed of sand-sized rock fragments. The fragments can vary in mineralogy, including mainly quartz, along with feldspar, and clay	
Breccia	Coarse, angular rock fragments ranging in size, with the largest >2 mm	Poorly sorted mixture of rock fragments, including angular or sub-angular pebbles	
Conglomerate	Coarse, rounded rock fragments ranging in size, with the largest >2 mm	Poorly sorted mixture of rock fragments, including rounded or sub-rounded pebbles	

BIOCHEMICAL AND CHEMICAL SEDIMENTARY ROCKS

Chemical and Biochemical Rocks

Limestone	Calcite crystals or microcrystalline calcite	Masses of large, interlocking calcite crystals or microscopic crystals not visible with the naked eye	
Fossiliferous Limestone	Calcareous skeletal fragments of coral or shells	Consisting of fossils or fossil fragments	
Oolitic Limestone	Calcite concretions, formed around sand or shell fragments	Aggregates of oolites, small spherical calcite concretions	
Chert	Cryptocrystalline Quartz	Microcrystalline polymorphs of quartz, formed by the recrystallization of siliceous skeletons. Conchoidal fracturing; scratches glass	
Rock Salt	Halite and sylvite crystals	Fine- to coarse-grained crystalline structure, with a salty taste and cubic cleavage	

The rock cycle



Metamorphic rocks



Slate



Phyllite



Gneiss



Quartzite



Marble