4.12 Sedimentary Rock Classification

predominantly coarse-grained: 2 mm and larger

Conglomerate
Rounded clasts

Photo: James St. John CC BY 2.0

Breccia
Angular clasts

Photo: R. Weller/ Cochise College

Sandstone predominantly medium-grained: 63 µm to 2 mm

Arenite: mostly sand grains and cement

Quartz arenite
(quartz sandstone)
more than 90% quartz

Feldspathic arenite
(arkose)
more than 10% feldspar

Photos: R. Weller/ Cochise College

Wacke: more than 15% fine-grained matrix (silt, clay)

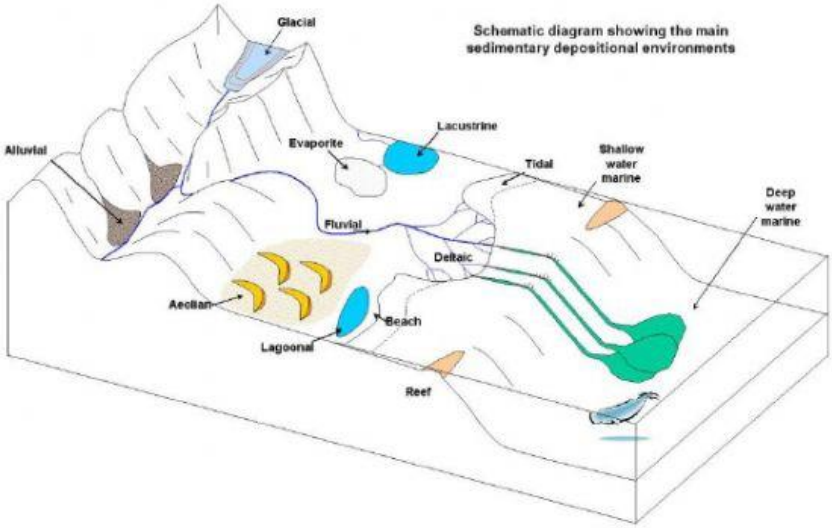
Photo: R. Weller/ Cochise College

fine-grained: less than 63 µm

Shale
Fine layering, fissile (breaks into thin layers)

Photo: R. Weller/ Cochise College

Mudstone
No layering (breaks into blocks)



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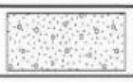
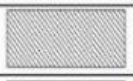
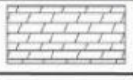
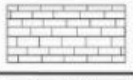
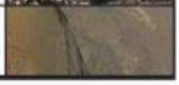
	Composition	Texture and Properties	
Detrital Sedimentary Rocks			
Shale	Fine rock fragments smaller than 1/16 mm	Clay-sized particles that cannot be differentiated by the naked eye. May be fissile, splits into distinctive layers	
Sandstone	Medium rock fragments between 1/16 mm and 2 mm	Composed of sand-sized 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	
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	

LIVEWORKSHEETS

Inorganic Clastic Sedimentary Rocks

Texture	Grain size	Composition	Comments	Rock name	Map symbol	Picture
Clastic (fragmental)	Pebbles, cobbles, and/or boulders in a matrix of sand, silt and/or clay	Mostly quartz, feldspar, and clay minerals; may contain fragments of other rocks and minerals	Rounded fragments	Conglomerate		
			Angular fragments	Breccia		
	Sand (0.063 to 2 mm)		Fine to coarse in a variety of colors	Sandstone		
	Silt (0.039 to 0.063 mm)		Very fine grained, massive, usually dark	Siltstone		
	Clay (<0.0039 mm)		Compact, brittle, usually dark	Shale		

Chemically and/or Organically Formed Sedimentary Rocks

Texture	Grain size	Composition	Comments	Rock name	Map symbol	Picture
Crystalline	Fine to coarse grains	Quartz	Chemical precipitates and evaporites	Chert		
		Halite		Rock salt		
		Gypsum		Rock gypsum		
		Dolomite		Dolostone*		
Crystalline or bioclastic	Microscopic to very coarse	Calcite	Biologic precipitates or cemented shell fragments	Limestone*		
Bioclastic	Clay (< 0.0039 mm)	Carbon	Black, compacted plant remains	Coal		
Bioclastic	Clay (< 0.0039 mm)	Clay and kerogen	Dark, may have oily smell or burn	Oil shale		

Other types of sandtone are arkose and graywacke. Varieties of limestone include chalk, coquina, micrite, travertine, oolite, tufa,and fossiliferous limestone.

* These react with dilute acid.

1. Describe the three main types of sedimentary rocks.

2. How can different types of limestone be bio clastic, chemical and organic?

LIVEWORKSHEETS

3. List sedimentary rock types by grain size, from small to large

1. List the three types of sedimentary rocks.

2. Where and how are clastic rocks found?

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3. How do clastic rocks form?

4. Contrast conglomerates and breccia rocks.

5. What can be found in clastic rocks?

6. Explain the difference between layers and bands.

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7. What can we learn from sedimentary rocks?

8. How do chemical rocks form?

9. What are bio clastic rocks?

10. List the two types of biolistic rocks.

LIVEWORKSHEETS