

## 4.12 Sedimentary Rock Classification

predominantly coarse-grained: 2 mm and larger

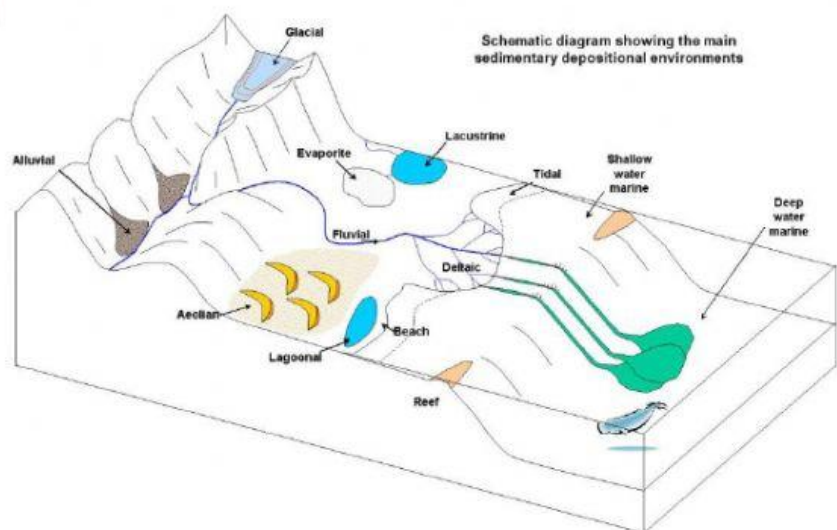
predominantly coarse-grained: 2 mm and larger	
<b>Conglomerate</b> <i>Rounded clasts</i>  <small>Photo: James St. John CC BY 2.0</small>	<b>Breccia</b> <i>Angular clasts</i>  <small>Photo: R. Weller/ Cochise College</small>





predominantly medium-grained: 63  $\mu$ m to 2 mm






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<b>Arenite: mostly sand grains and cement</b>  Quartz arenite (quartz sandstone) more than 90% quartz <small>Photos: R. Weller/ Cochise College</small>	<b>Wacke: more than 15% fine-grained matrix (silt, clay)</b>  Feldspathic arenite (arkose) more than 10% feldspar <small>Photo: R. Weller/ Cochise College</small>

fine-grained: less than 63  $\mu$ m

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<b>Shale</b> <i>Fine layering, fissile (breaks into thin layers)</i>  <small>Photo: R. Weller/ Cochise College</small>	<b>Mudstone</b> <i>No layering (breaks into blocks)</i> 



		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		

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

\* These react with dilute acid.

- Describe the three main types of sedimentary rocks.
- How can different types of limestone be bioclastic, chemical and organic?



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?

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.

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.