Sedimentary Rocks

How do we classify sedimentary rocks?

By: Mrs. Rand

Phenomenon: Sedimentary Rocks

Sedimentary Rocks

- Sedimentary Rocks - rock type that forms from an accumulation of sediment derived from preexisting rocks and/or organic material
- Sediment - solid fragmented material that is transported and deposited in layers on the Earth's surface

Sedimentary Rocks

- Synonyms for Sediment:

FRAGMENTS

PARTICLE

PIECES

CLASTS

GRAINS

Sedimentary Rocks

- Methods to classify sedimentary rocks:

Sedimentary Rocks

1. Texture - the physical makeup of the rock including size, form and orientation of the pieces

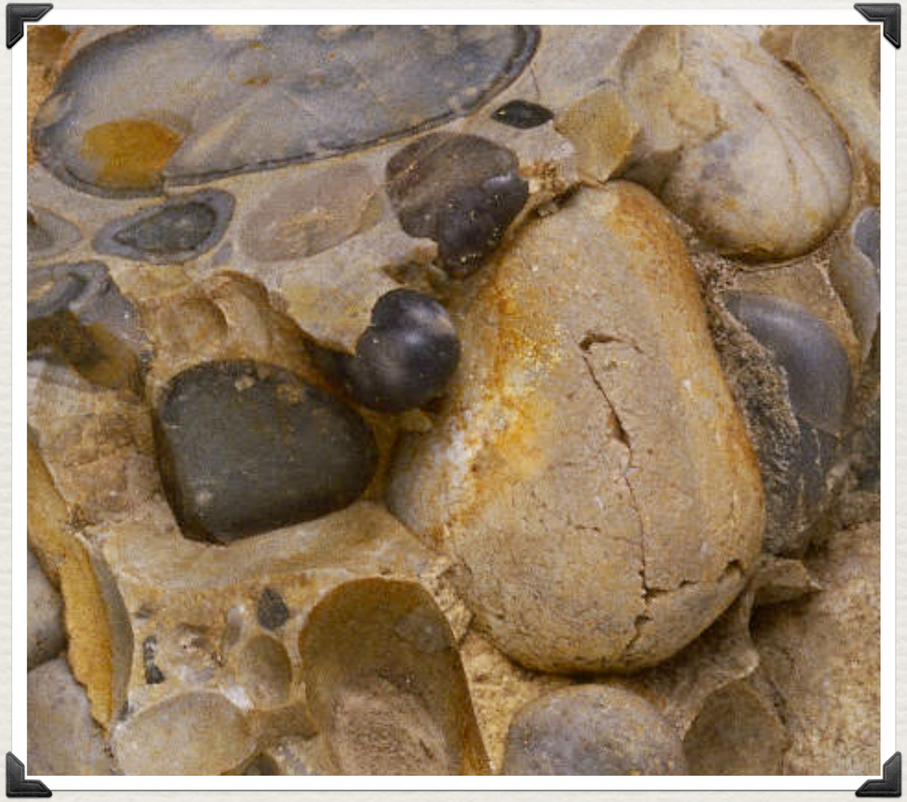
Sedimentary Rocks

- Clastic - rock that formed from the fragments or pieces of other rocks and can be identified by size

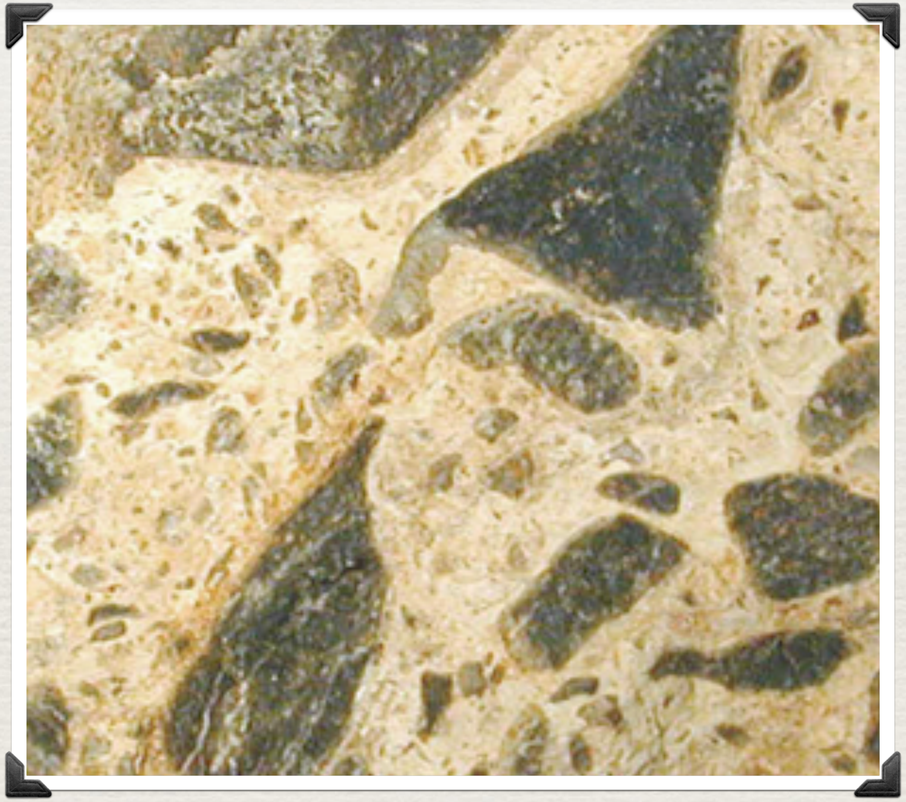
Conglomerate

Breccia

Sedimentary Rocks



Conglomerate
Rounded Fragments



Breccia
Angular Fragments

Conglomerate

Sedimentary Rocks

- Crystalline - rock that formed from mineral grains that fall out of solution by evaporation

Rock Salt

Rock Gypsum

Rock Salt

Sedimentary Rocks

- Bioclastic - rock formed from the plant remains and/or former living things

Coal

Limestone

Limestone

Coal - Wyoming

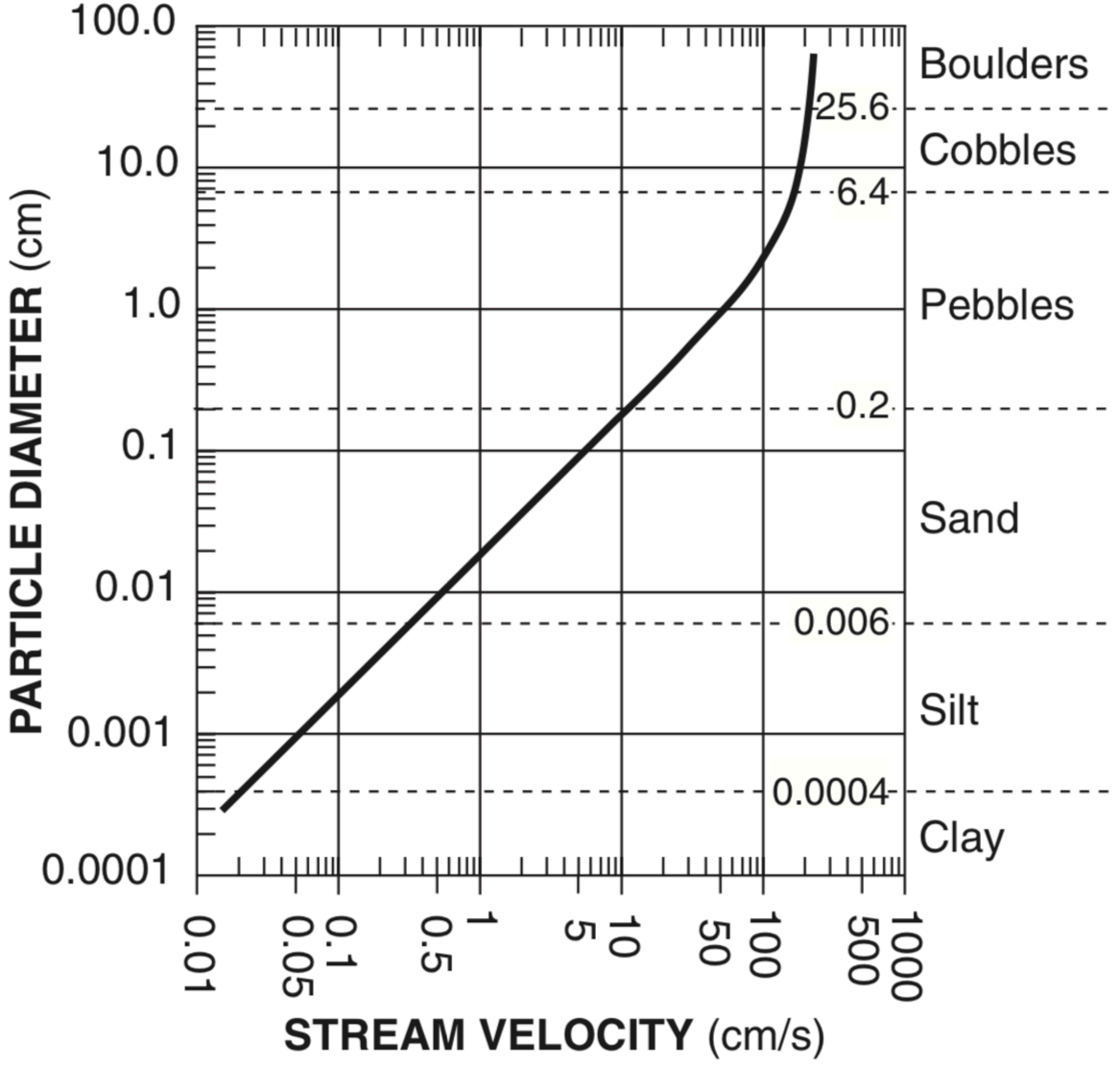
Sedimentary Rocks

2. Grain Size - individual size of the grains when measured

Clay	Silt	Sand	Pebble	Cobble	Boulder
less than 0.0004	0.0004 - 0.006	0.006 - 0.2	0.2 - 6.4	6.4 - 25.6	greater than 25.6

Measured in Centimeters [cm]

Relationship of Transported Particle Size to Water Velocity



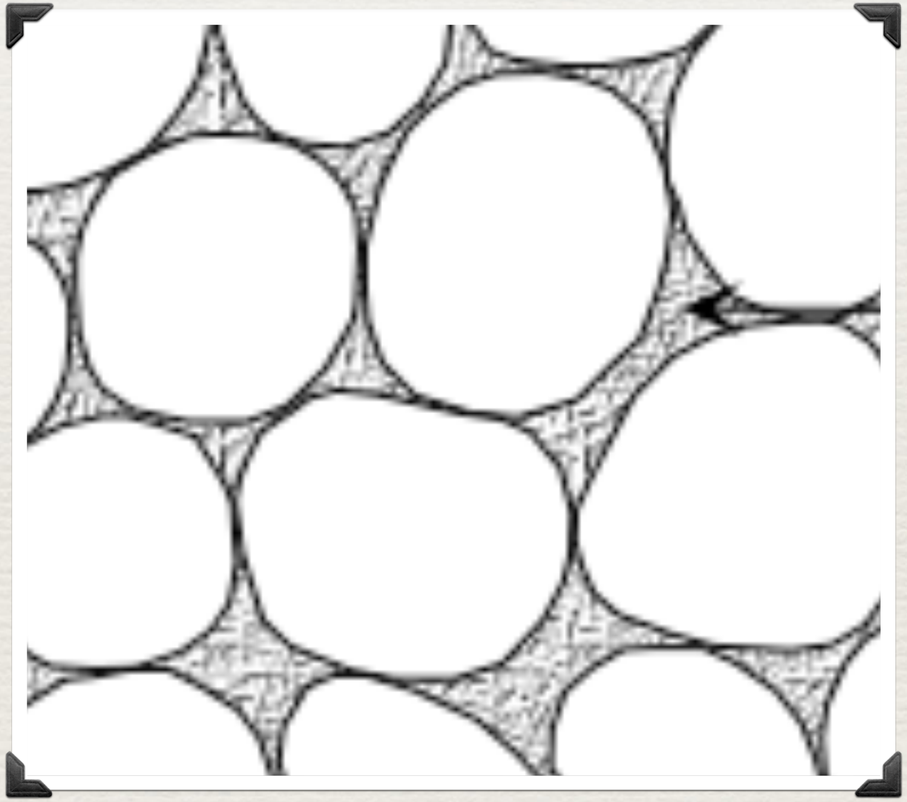
Sedimentary Rocks

3. Lithification - the manner in which a sedimentary rock's pieces are held together

Sedimentary Rocks

- Cementation - clasts such as clays, sands and silts are glued together
    - Dissolved minerals in water hold the clasts together after evaporation

Sedimentary Rocks



Cemented Fragments

Cemented Fragments

Sedimentary Rocks

- Compaction - a reduction in volume of sedimentary layers due to increasing weight
    - Usually results in a more tightly packed form with a decrease in pore space

Sedimentary Rocks

Sandstone

Sandstone [magnified]

Sandstone - Arizona

Sedimentary Rocks

- Chemical Action - a rock formed when dissolved minerals in water form a crystalline mass of ingrown mineral crystals after evaporating

Sedimentary Rocks

Rock Salt

Salt Flats - Utah

Sedimentary Rocks

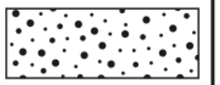
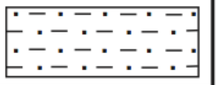
4. Characteristics - additional properties and traits that may help identify a sedimentary rock
    - Form at or near Earth's surface
    - Forms in horizontal layers
    - May contain fossils

Layered Rock - Grand Canyon

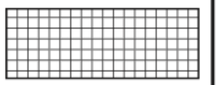
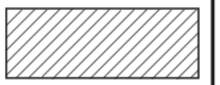
Weathered Arch - Jordan

Crinoid Fossil - Germanic Basin

INORGANIC LAND-DERIVED SEDIMENTARY ROCKS

TEXTURE	GRAIN SIZE	COMPOSITION	COMMENTS	ROCK NAME	MAP SYMBOL
Clastic (fragmental)	Pebbles, cobbles, and/or boulders embedded in 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 (0.006 to 0.2 cm)		Fine to coarse	**Sandstone**	
	Silt (0.0004 to 0.006 cm)		Very fine grain	**Siltstone**	
	Clay (less than 0.0004 cm)		Compact; may split easily	**Shale**	

CHEMICALLY AND/OR ORGANICALLY FORMED SEDIMENTARY ROCKS

TEXTURE	GRAIN SIZE	COMPOSITION	COMMENTS	ROCK NAME	MAP SYMBOL
Crystalline	Fine to coarse crystals	Halite	Crystals from chemical precipitates and evaporites	**Rock salt**	
		Gypsum		**Rock gypsum**	
		Dolomite		**Dolostone**	
Crystalline or bioclastic	Microscopic to very coarse	Calcite	Precipitates of biologic origin or cemented shell fragments	**Limestone**	
Bioclastic		Carbon	Compacted plant remains	**Bituminous coal**