

Sedimentary Rocks

How do we classify sedimentary rocks?



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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

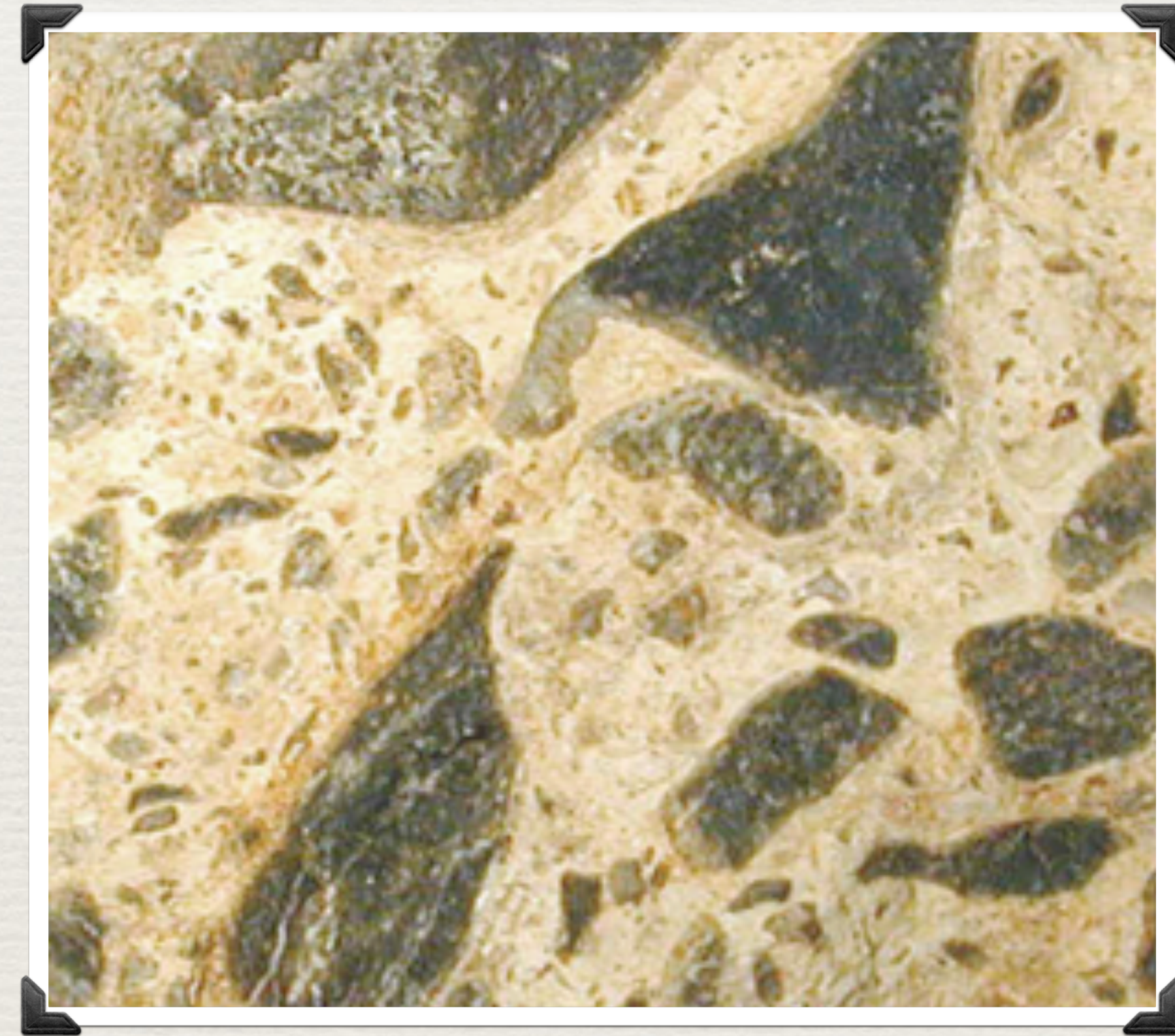


Breccia

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



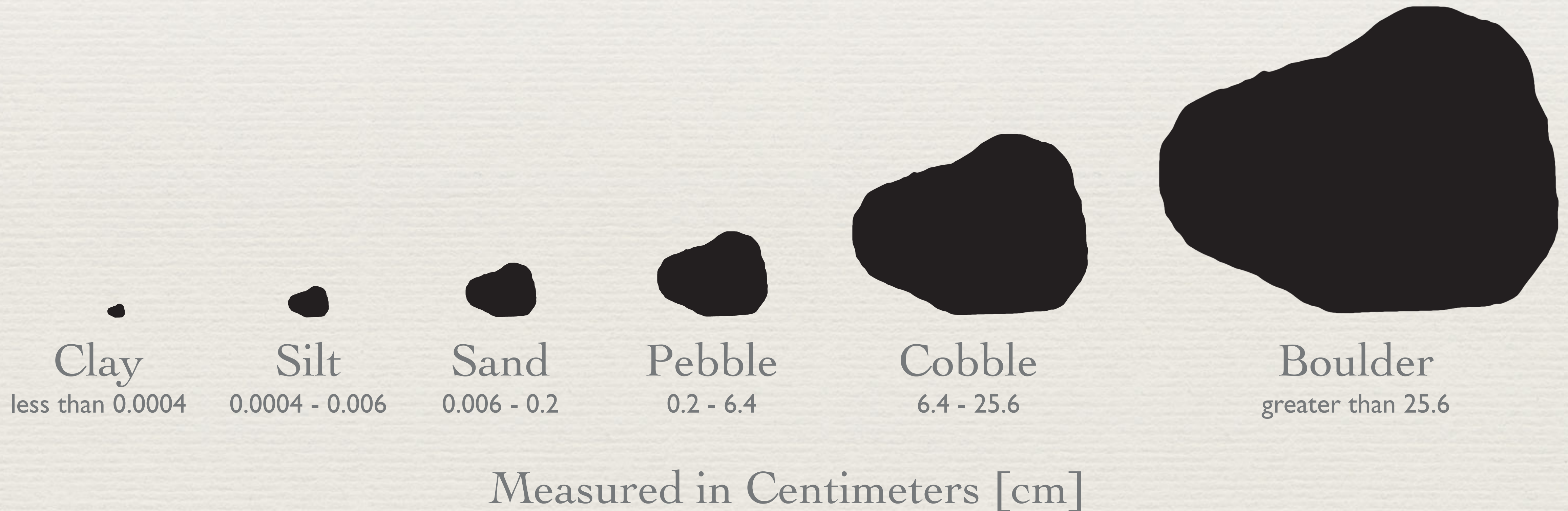
Limestone



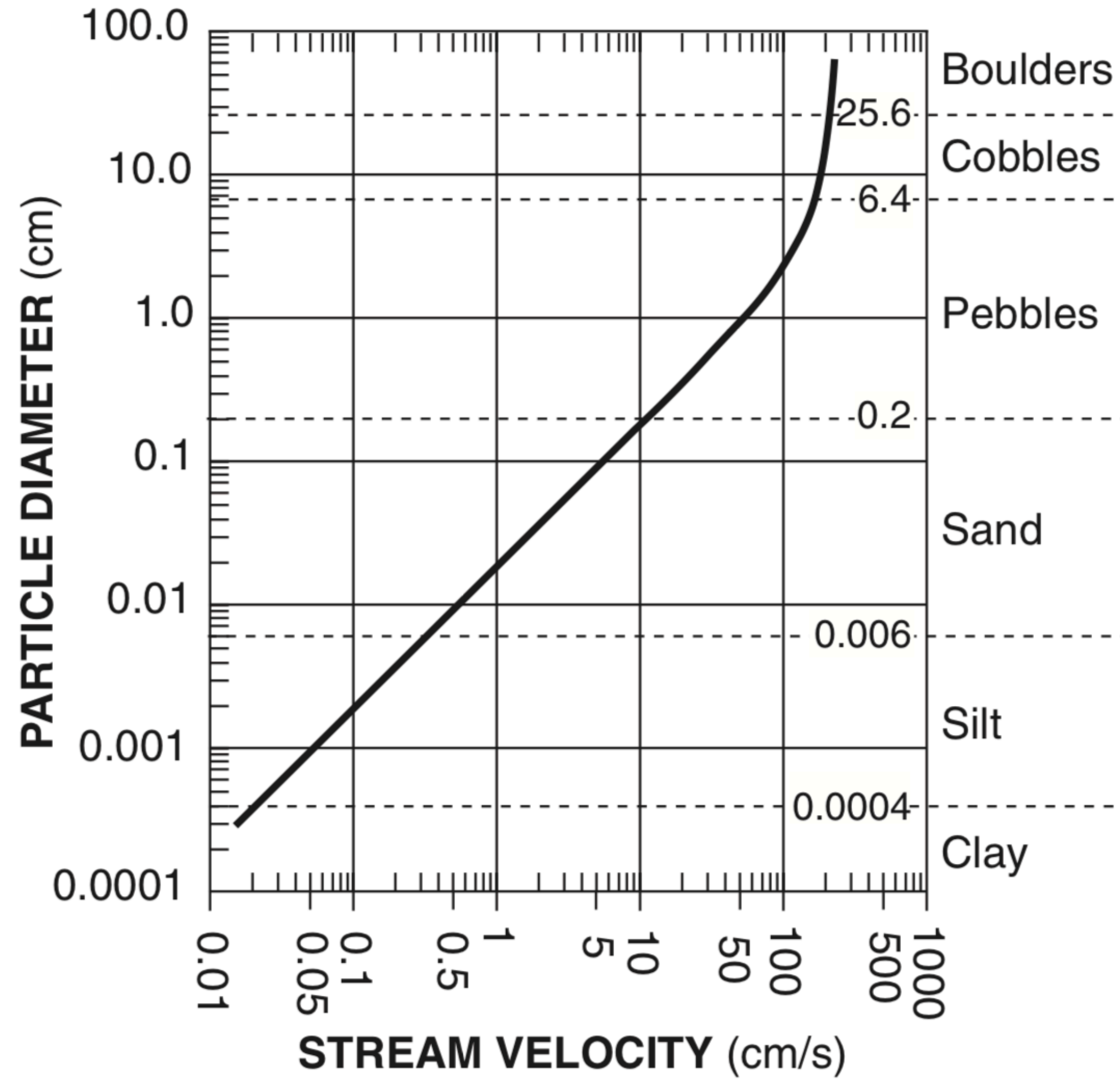
Coal - Wyoming

Sedimentary Rocks

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



Relationship of Transported Particle Size to Water Velocity



Sedimentary Rocks

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

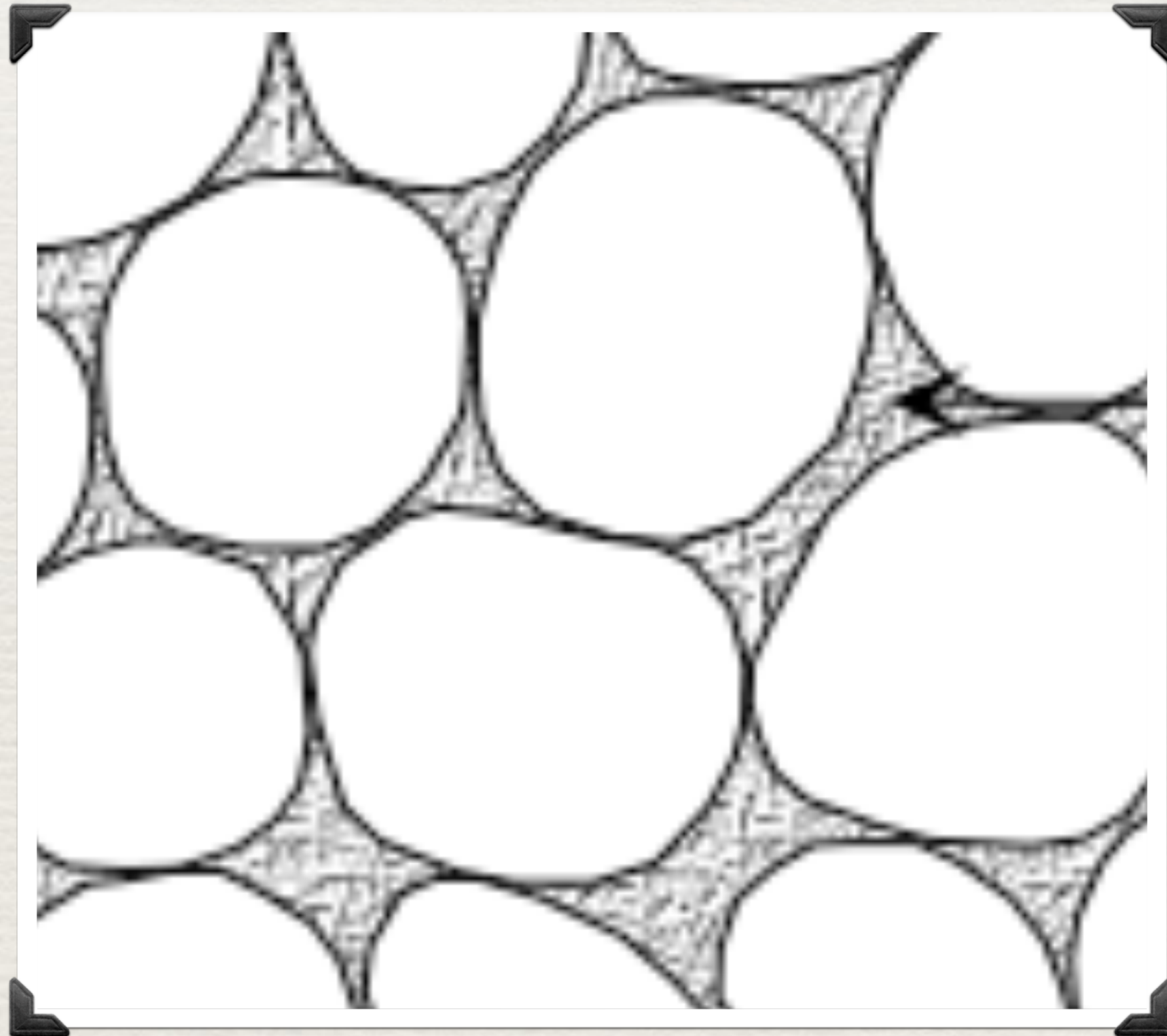


Sedimentary Rocks

- ♦ 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



Compaction

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




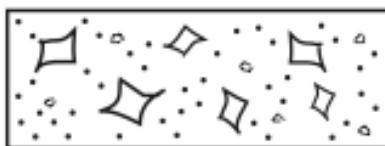

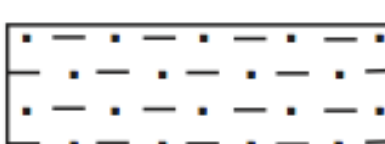

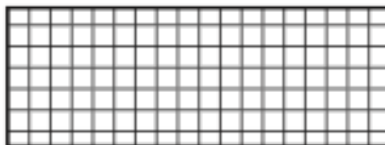


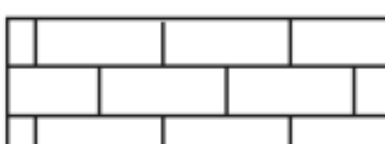
Layered Rock - Grand Canyon



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	