

4.4

MAKING SEDIMENTARY ROCK INFERENCES

How do geologists identify sedimentary rocks?

INFER THE GRAIN SIZE

The weathering of existing rocks is responsible for the producing the sediments that will form the sedimentary rocks we find today. These processes work to break rocks into smaller particles (sediments) that have the same chemical compositions as their parent rock. These weathered products (sediments) are carried off to be deposited in a new location by running water, wind, glaciers, and gravity. The process of transporting these sediments to a new location is called erosion. Sediment grain size is the most important attribute of sediments. In 1922, Chester K. Wentworth developed the Wentworth grade scale which standardized the classification of sediments into four size fractions that include gravel, sand, silt, and clay. Geologists can use evidence, like sediment grain size, rounding, sorting, and fossils recorded in layers of sedimentary rock exposed at or near the surface to reconstruct details of Earth history.

MATERIALS

- Rock kit
- Magnifying glass
- Wentworth grade scale (to the right)





DIRECTIONS

1. Using a magnifying glass and the Wentworth grade scale, sort the following rock samples and place them from largest to smallest grain size on the line below: 13B, 14B, 15B, 16B, 17B, 18B











2. Identify the common sediment name that each of the following sedimentary rocks is composed of:

Sample	Common sediment name
13B	
15B	
18B	

Size Range (millimeters)	Particle Name	Common Name	Detrital Rock
>256	Boulder	Gravel	 Conglomerate  Breccia
61-256	Cobble		
4-64	Pebble		
2-4	Granule		
1/16-2	Sand	Sand	 Sandstone
1/256-1/16	Silt	Mud	 Shale or Mudstone
<1/256	Clay		

4.4 MAKING SEDIMENTARY ROCK INFERENCES CONTINUED

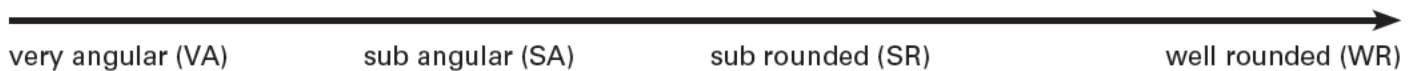
Grain Angularity and Sphericity

	Angular	Subangular	Subrounded	Rounded
High sphericity				
Low sphericity				

INFER THE GRAIN ROUNDNESS

Grain Roundness:

1. Rank samples 13B, 15B, 16B, and 18B from very angular to well rounded below:

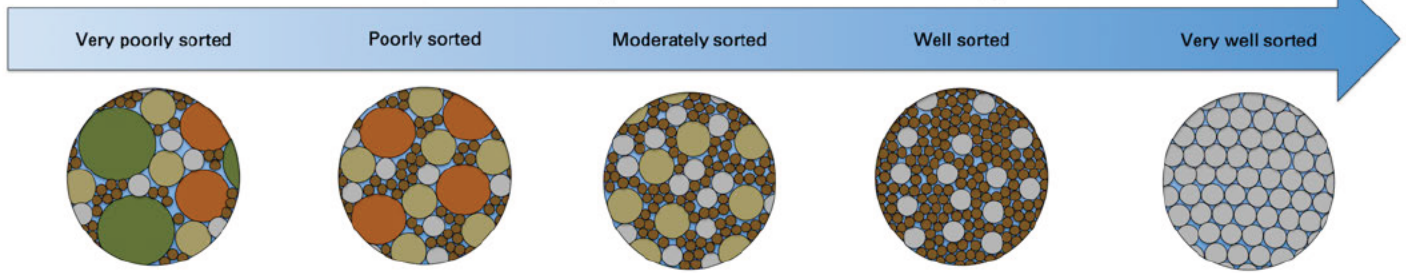


REFLECTION

Identify a process that would be responsible for the changes in angularity from angular to rounded.

4.4 MAKING SEDIMENTARY ROCK INFERENCES CONTINUED

Sedimentary Grain Size Sorting



Sediments are considered "very poorly sorted" when there is a large variation in grain size. Sediments are considered "very well sorted" when the grains are all the same size.

INFER THE GRAIN SORTING

Grain Sorting:

1. Rank samples 13B, 15B, 16B, and 18B from poorly sorted to well sorted below:



REFLECTION

If all of the samples originated from the same source region explain how the samples are fine grained, well rounded and well sorted the further they travel from the source.