

SEDIMENT

WEATHERING

Weathering is the physical and chemical breakdown of rock to produce sediments consisting of resistant minerals and rock fragments.

Physical weathering is the process by which rocks are broken into smaller fragments without significant changes to their chemical. Examples include freeze-thaw weathering where freezing water creates enough pressure in rock fractures to crack most types of rock, and stress-release weathering, which results from a change in pressures on a rock that was once buried deep beneath the surface.

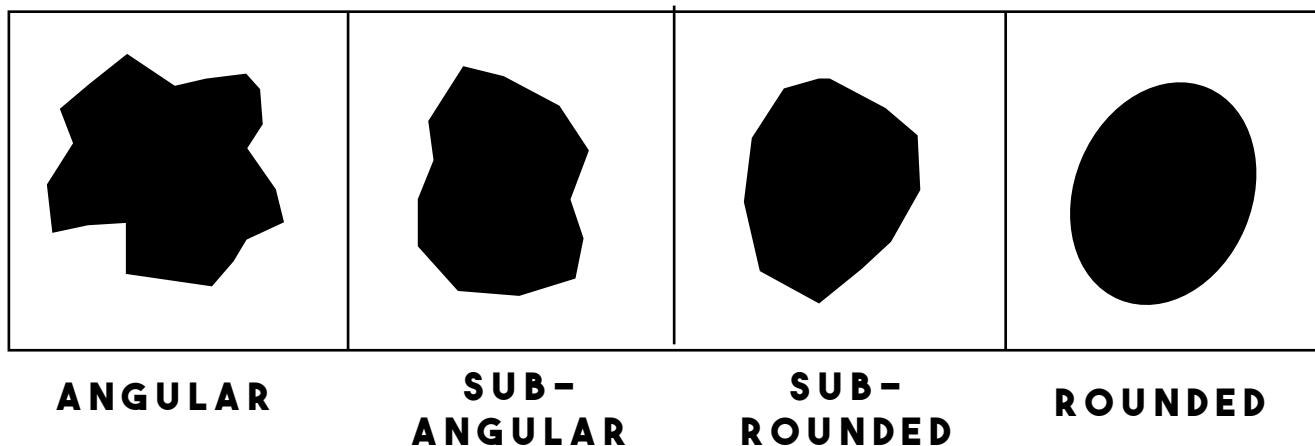
Chemical weathering involves changes to the chemical composition of rocks. Minerals in the rocks are affected by water and air causing some components of the mineral to dissolve. Other mineral elements combine to form new minerals. Examples include minerals that are highly soluble and dissolve such as calcite or halite, and oxidation and reduction of iron and manganese bearing minerals.

SEDIMENT TRANSPORT

Sediment transport processes include particles moved by fluid, wind, glacial ice, and gravity. Fluid flow involves a sustained, down current movement of sediment (like a river). Particles are lifted from the sediment bed and are rolling, sliding, and impacting other sediments along the way. How far sediment is transported depends on both density and diameter of the sediment, as well as the velocity of the fluid flow. Sediment can consist of a mixture of larger sediments and fine particles.

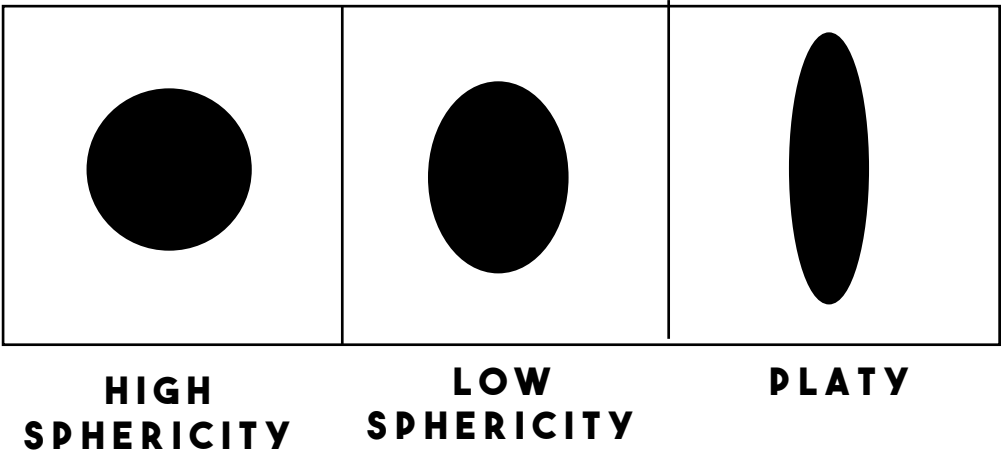
SEDIMENT ROUNDNESS

The roundness of sediments depends on several things including mineral composition and the distance of transport. Hard, resistant grains, such as quartz are not easily rounded and take a longer time to become rounded. Some experimental studies suggest quartz pebbles can become rounded after about 180 miles of transport by a stream! Sediment roundness is usually described on a scale from angular to rounded, as shown below.



SPHERICITY

Sphericity describes how closely a shape resembles a sphere. In sediments, sphericity is mainly dependent on the original shape of the particle. Sphericity can be described on a scale from having high sphericity, thus resembling a sphere, to elongated or platy, as shown below.



SURFACE TEXTURE

The surface of pebbles and cobbles can be polished and smooth, or marked by pits and scratches. These surface textures can form by abrasion during sediment transport, or by sediments colliding and grinding past one another.

TUMBLE MIX OBSERVATIONS

Look closely at your tumbled gemstones to observe sedimentary textures such as roundness, sphericity, and surface textures such as pits or scratches. Complete the below table for several of your tumbled gemstones.

Mineral	Roundness	Sphericity	Surface textures