Knocking Off the Rough Edges – Student Activity

Clasts are bits of broken rock and are the product of weathering. When clasts are transported (eroded) they will collide and abrade (break and become rounder). The longer they are carried the rounder and smaller clasts become. Transport is usually by wind or water.

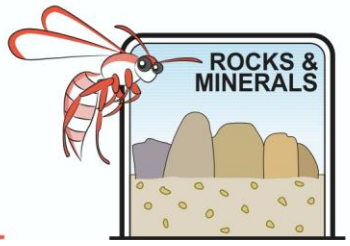
An homogeneous rock: (Greek homo = same, genus = kind)
Materials per group

- A container with lid
- Even sized pieces of rock or rock like material
- Timer
- Six marbles (optional)
- Hand lens

You will be shaking materials in a jar and observing what happens.

1. Discuss which strategy would result in the most effective breakdown of material. (Either take 5 minute turns to shake the jar or 1 minute turns).
2. Estimate the percentage of coarse, medium and fine clasts that are present after each shaking interval
3. Shake in a rolling fashion
4. Select a typical clast for each interval and sketch it into the space provided in the worksheet.
5. Add a scale.

Time	Shape	Scale	% coarse	% medium	% fine
0					
5 minutes					
10 minutes					



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Time	Shape	Scale	% coarse	% medium	% fine
15 minutes					
20 minutes					
25 minutes					

Which strategy did you use? _____

Why did you decide on this strategy? _____

_____

Explain the change in the rate of breakdown._____

_____

Was your strategy effective? _____

Ball Mills

If rocks need to be finely ground then ball mills are used. Gold is often found finely distributed through other rocks. Crushing allows more surface area of gold bearing rock to be exposed for chemical treatment. Hard ceramic or steel balls are added to tumbling mills.

Repeat the previous experiment adding 6 marbles.

How long does it take to reduce the rock fragments to fine dust? _____

Homework option: Heterogeneous rock (Greek hetero = other, genus = kind).

Most weathered material is not homogeneous. Clasts would have come from a variety of sources and be weathered to different degrees. Some rocks also contain different minerals which weather at different rates and have different hardness.

Biscuits/cookies can represent heterogeneous rocks. Chop chip cookies and sultana cookies can be shaken to demonstrate that some components break down faster than others.

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Our Western Australian granites only contain a very small amount of rare earth minerals such as ilmenite and monzanite. Some granite gneisses also contain garnets. These minerals are very resistant to weathering and are quite heavy. They remain and become concentrated by currents of wind and movement by water in the sea.

Dark mineral rich layers of sand on the beach near Cape Leeuwin Southwest WA