

Clastic Rocks

Chapter 8

Rocks begin to weather as soon as they are exposed to air. Small and large chunks of rock break off due to physical weathering. These bits and pieces of rocks and minerals are called *detritus* (Latin for worn down). Broken and weathered pieces of older rocks are clastic sediments. Clast is (from the Greek word *klastos*, meaning broken into pieces). The individual clasts can range in size from boulders down to microscopic pieces of clay.

Composition of clastic rocks

Clastic rocks consist chiefly of quartz, feldspars, rock fragments, micas, clay minerals, iron oxides and calcite. Other clasts result from chemical alteration of the minerals during chemical weathering.

Wentworth Scale of Clastic Sediments

Particle	Size of clasts	Sediments	Clastic rocks
Boulder	More than 256 mm	Boulder gravel	Boulder conglomerate
Cobble	64 to 256 mm	Cobble gravel	Cobble conglomerate
Pebble	2 to 64 mm	Pebble gravel	Pebble conglomerate
Sand	1/16 to 2 mm	Sand	Sandstone
Silt	1/256 to 1/16 mm	Silt	Siltstone
Clay	Less than 1/256 mm	Clay	Mudstone or shale

Classifying clastic rocks

The range of particle sizes in a rock is used to classify clastic rocks. There are four main groups of particle sizes. The coarsest particles are gravel.

There are three subgroups of gravel because of the great variation in size. The subgroups are **boulder gravel** that are more than 256 mm in size, **cobble gravel** between 64 and 256 mm in size, and **pebble gravel** that ranges between 2 and 64 mm in size.

Sand, silt, and clay clasts complete the groups.

The clasts may consist of any type of rock fragment or mineral. While most people think of sand as quartz, it can also be any sand-sized piece of a rock or mineral.

Physical weathering of rocks

Physical weathering of rocks occurs when water seeping into cracks in rocks freezes. The expanding ice breaks off parts of the rock. The expansion and contraction of rocks during hot days and freezing nights can also cause parts of a rock's face to break off. Roots of plants growing in cracks and crevices cause rocks to break apart.

Name _____

Date _____

Clastic Rocks

Quiz 8

Fill in the blanks using words from the Word Bank

1. Conglomerates form when _____ and sand are cemented together.
2. The longer a rock stays in streams and rivers the _____ and smoother it becomes.
3. Sandstone forms when sand-sized grains of _____ and other rock fragments are cemented together.
4. Breccia has jagged and sharp edges because it usually forms at the base of cliffs or in _____ zones.
5. Clasts, small rock particles, break off as rocks _____ around in streams.
6. Claystone is _____ to the touch while siltstone feels gritty to the touch.
7. Rocks begin to weather as soon as they are _____ to the air.
8. _____ and calcite bind sandstones together.
9. Small and large chunks of rock break off due to _____.
10. _____ is coarse-grained sandstone containing quartz, feldspars, and rock fragments.

Word Bank

minerals	exposed	tumble	pebbles	greywacke
smooth	silica	rounder	weathering	fault

Sand Slides

Activity 8

Introduction

Sand is the broken bits and pieces of older rocks. Sand can be any mineral or rock fragment that is sand-size.

In this activity you will be creating your own sand slides using simple materials.



Materials

- ◆ Sand
- ◆ Paper punch
- ◆ Black cardboard
- ◆ Scotch tape
- ◆ Small hand lens

Directions

1. Collect samples of sand in small jars.
2. Label each jar of sand with the place and date it was collected.
3. Cut a piece of cardboard 2.5 cm wide and 7.5 cm long. Construction paper may also be used.
4. Punch three holes in the cardboard.
5. Tape the back side of the slide with scotch tape that is sticky. This is important because you want your sand particles to stick to the tape and not fall off.
6. Sprinkle some sand from one of your jars onto each of the three holes on your slide.
7. Press down the sand so it sticks to the tape.
8. Look at the individual grains of sand with a small hand lens.
9. Repeat the above steps with each of the samples of sand you have collected.

More science activity ideas

- ◆ Start a sand collection from different rivers or lakes near where you live.
- ◆ Start a sand collection by having people send you samples of sand from other areas where they live.
- ◆ Create a chart with some of your sand slides telling where the sand was collected, the type of rocks they originated from and other interesting details.

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