

# Sedimentary Rocks

**Overview:** Sedimentary rocks are broken into three different types: organic, chemical, and clastic. The Acid Test determines which rocks are clastic because they don't react with the acid. Here's another test to further determine the different kinds of clastic rocks by using the hardness scale.

**What to Learn:** Clastic rocks come in very different shapes and sizes, but they all have a few characteristics in common. A clast is a grain of sand, gravel, pebble, etc that makes up a rock. Clastic rocks look like they are made up of fragments of other rocks.

## Materials

- Small piece of plate glass
- Magnifying lens
- Vinegar
- Paper towel
- Shallow dish
- Rock samples (in the video: bituminous coal, sandstone, siltstone, shale)

## Experiment

1. Number and label your samples with your data table.
2. Take your hand magnifier and look closely at each sample and record the color information on the data table.
3. Use a dropper to take vinegar out of its bottle.
4. Drop a few drops onto your sample and watch for a reaction. If you see a reaction, note this in the data table and classify the rock as a chemical rock, not a clastic rock.
5. Wipe your samples dry with a clean, damp cloth.
6. Test the hardness of your sample with the nail and record it in your data table using Mohs' Hardness Scale.

# Sedimentary Rocks Data Table

*After you run your tests, circle the rock samples (in the left column) that are clastic.*

Sample	Color	Hardness (1-10)	Chemical or Clastic?	Name of Rock/Mineral?

## Reading

Clastic sedimentary rocks are fragments of other rocks. Geologists look at the tiny particle grains that make up the rock when they name the rock. For example, mudstone is named for its tiny particles of mud and clay, and sandstone is made up of larger grains of sand. The conglomerate rocks look like they are made up of pebbles. Siltstone under a strong magnifier show microscopic grains.

## Exercises

1. Give three types of clastic sedimentary rocks.
2. How can you tell a clastic from a non-clastic rock?
3. Does hardness determine a clastic rock? If so, what hardness do you expect a clastic rock to have?

**Answers to Exercises: Sedimentary Rocks**

1. Give three types of clastic sedimentary rocks. (conglomerate, sandstone, siltstone)
2. How can you tell a clastic from a non-clastic rock? (Clastic rocks do not react with acid and are made up of tiny individual grains.)
3. Does hardness determine a clastic rock? If so, what hardness do you expect a clastic rock to have? (No.)

# Rock Hound Hunt

**Overview:** This is the first of three “field trip” type of labs where students are given a pile of unlabeled rocks, and asked to identify them using the test techniques we’ve covered. The samples for this first set are easy to do since the samples are larger, and the instructional video walks you through every sample and how to tell which is which.

**What to Learn:** We’ve covered sedimentary rocks in the previous lessons (the rocks used in those lessons are also found in the set required for this lab), so now is your chance to identify igneous and metamorphic rocks in your set by looking at color, streak, hardness, luster, chemical reactivity, and more! Let’s put your new skills to the test. It’s best to work right alongside the video as you go.

## Materials

- “Know Your Rocks” (also called “Learn Your Rocks”) set by Geoscience Industries, which includes the following samples: basalt, granite, pumice, rhyolite, diorite, gabbro, andesite, obsidian, bituminous coal, limestone, conglomerate, coquina, shale, siltstone, sandstone, dolomite, anthracite coal, soapstone, marble, amphibolites, quartzite, slate, gneiss, and schist. You can also use the smaller Washington Pack as well.
- Penny
- Nail
- Streak plate
- Water in a graduated container
- Scale that measures in grams
- Longwave UV light source
- Sunlight

## Experiment

1. You’re first going to classify your pile of rocks right along with the instructional step-by-step video. So fire up the video and get your materials out as you complete the data table. You’ll be testing for color, streak, hardness, density, luster, cleavage, fracture, tenacity, acid reaction, and fluorescence. Enjoy your first real geologist rock hunt!

## Rockhound Data Table

[illegible]

**Quick reference:**

- **Mohs' Hardness Scale:** fingernail: <2.5, penny: 2.5-3.5, steel nail (5.5), streak plate (7)
- **Density:**  $\rho = \text{mass} / \text{volume}$  (where mass is measured in grams, volume in mL)
- **Luster:** metallic, submetallic, glassy, adamantine, resinous, silky, pearly, greasy, pitchy, waxy, dull
- **Cleavage:** perfect, good, poor, none, and in how many planes: 1, 2, or 3?
- **Fracture:** conchoidal (like a shell), earthy, hackly, jagged, splintery, uneven
- **Tenacity:** brittle, sectile, malleable, ductile, flexible-elastic, flexible-inelastic
- **Acid Test:** Drop a few drops onto your sample and watch for a reaction. If you see a reaction, note this in the data table with a "Y". Otherwise, write "N" for no reaction.
- **UV:** Record the color you see when the sample is exposed to *longwave* UV light.