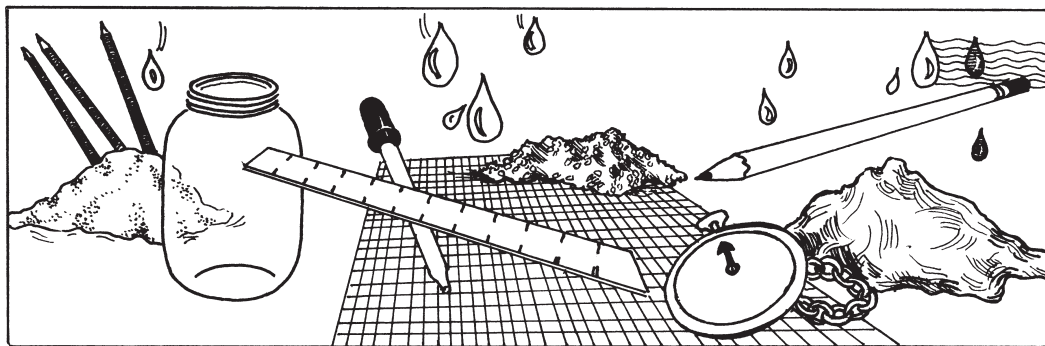


Geology Chapter Teacher Sheet



Activity #1: Constructing a Set of Soil Sieves

Adapted from "Constructing a Set of Soil Sieves," CurriculumResources for Earth Science Teachers, Maine Department of Conservation.

*California Content Standards
Earth Sciences 3c
Investigation and Experimentation 1a*

Objectives:

To provide a set of soil sieves that can be used to sort sediments by size, and to involve students in the construction of the sieves.

Time:

One 55-minute class period

Background:

Soil sieves are useful tools for separating the coarse sand, fine sand, silt, and clay fractions from a soil sample, but purchasing sets for a class of students can be expensive. These directions can be used to produce 16 sets of screen sieves, with 4 sieves to the set, for a cost of approximately \$100 - \$150 depending on local sources of supply. Students also benefit from making their own tools because they are more likely to acquire ownership of the process when using tools that they have made.

Materials:

To make 16 sets of 4 sieves, you will need to purchase the following:

One strip (1 foot wide by 4 feet long) of #10, #25, #230, and 5 micron stainless steel cloth. This cloth is available from Sepor, Inc, P.O. Box 578, Wilmington, CA 90748. Phone 310-830-6601 or email SepMail@sepor.com.

64 one-pound coffee cans or any empty aluminum cans that have a diameter of about 10 to 12 cm.

Students can start collecting these and bringing them to class.

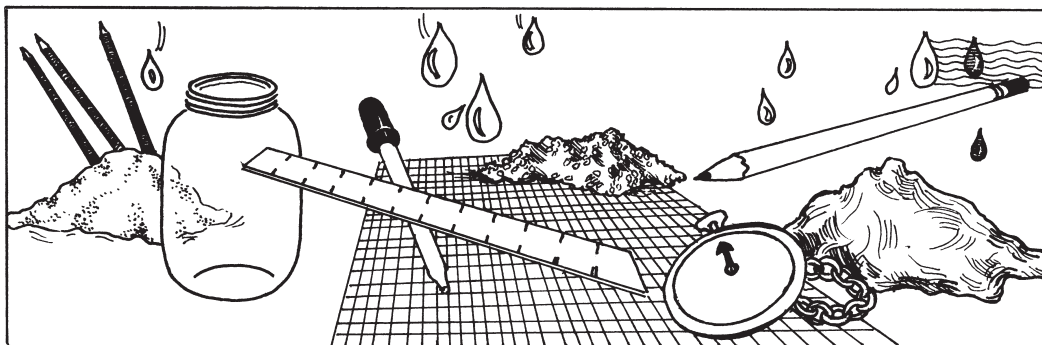
64 5-inch hose clamps.

Have the following items available: meter sticks, magic markers, tin snips or hacksaw, file, can opener, pliers, screw drivers, paint, brushes, and stencils (#1, 2, 3, and 4)

Procedure:

Cut the screen cloth into 15 cm squares (or about 4 cm larger than the diameter of the cans). Students should be careful when removing the coffee can bottoms. Filing will dull the open end of the cans. Be sure the students don't over-tighten the hose clamps since this will warp the coffee can and make the sieves difficult to use.

Geology Chapter Student Sheet



Activity #1: Constructing a Set of Soil Sieves

PURPOSE:

To construct a set of 4 soil sieves that can be used as a soil-sorting device.

INTRODUCTION:

Soil composition determines many characteristics of soils, such as infiltration rates (the rate at which water moves into a soil), percolation rates (how fast water moves through the soil), settling rates (how fast sediments sink to the bottom of a body of water), oxygen content of the soil, and the ability of the soil to support plant and animal life. To determine the sizes of particles within a sample of soil, a set of soil sieves is used.

Typically, the sieve set will include containers covered with screen cloth of various sizes of mesh. By sifting a soil sample through all the sieves in the set, the mass and volume of each particle size can be determined. You will construct a set of 4 sieves using 4 different sizes of mesh.

MATERIALS:

For each set of 4 sieves, you will need the following:

- 1 15-cm square each of #10, #35, #230, and 5 micron screen cloth
- 4 one-pound empty coffee cans
- 4 5-inch hose clamps

You will also need the following tools:

- can opener
- file
- pliers
- paint, paintbrush, and stencils (the numbers 1, 2, 3, and 4)

PROCEDURE:

1. Remove both ends of the coffee can. File the cut edges of the can until they are no longer sharp.
2. Place the can in the center of one 15-cm square of screen cloth.
3. Crimp the cloth up around the ends of the can; this may require snipping the cloth slightly on the larger meshes.
4. Hold the cloth to the can with the 5-inch hose clamp tightened securely around the base of the can. The clamp should rest just above the metal ridge at the bottom of the can.

NOTE: Do NOT over-tighten the clamp since this will warp the can and make it hard to use.

5. Using the paint and stencils, paint a number on the can based on the following chart:

Number	Mesh
1	#10
2	#35
3	#230
4	5 micron

6. Repeat this process for each mesh size in the set.

QUESTIONS:

1. How could Justine and Marc, from the Geology reading, have used a sieve set when they were constructing their estuary?

2. How could a sieve set help you in determining why different plants grow in different areas of the Tijuana Estuary?