

Part 2 Soil Testing Activities

Explore the texture, drainage, and particle density of different soils, and observe garden soil fauna.



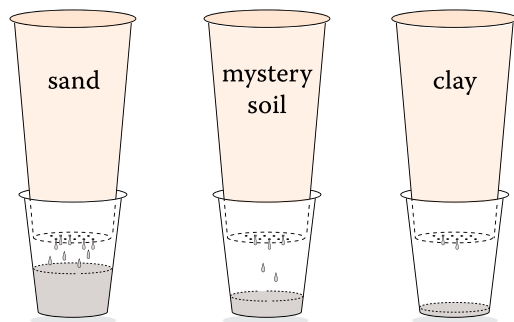
SCIENCE ACTIVITY 2: SOIL PERCOLATION TEST

» determine the drainage rate of different soil samples

MATERIALS

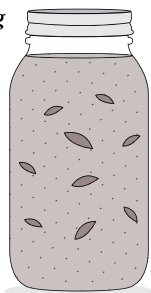
- Various soil samples
- Two sizes of paper coffee cups: 3 small and 3 large per group
- Tool to make holes in the bottom of large coffee cups, such as a large nail, or other sharp pointed object.

Note: With young students, large coffee cups can be perforated prior to the lesson. Small coffee cups are **not** perforated, as they will collect the drained water.

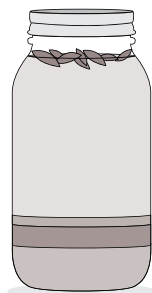


Students can work in groups and have 1-3 types of soil (eg. pure sand, pure clay, and a mystery sample to emphasize different drainage properties based on particle size). Each group should have 2 coffee cups per soil sample (one large coffee cup and one smaller cup). Label large coffee cups with the type of soil you are testing (sand, clay, garden soil etc.). Using a nail or other sharp tool, the bottom of the large coffee cup should be perforated with many small holes. To standardize the test, all large coffee cups should have the same number and size of holes in the bottom. Fill the large coffee cup with 1 cup of soil and place in the small coffee cup (with no holes). All students should begin pouring ~1 cup of water over their soil sample at the same time. Students need to record the time it takes for the water to drain through their soil sample. This test will determine the drainage properties of the soil sample. (Sand or large particles will drain much more quickly than fine clay particles).

Right after shaking



After 24 hours



leaves & twigs

clay (lightest density)
silt (medium density)
sand (heaviest density)

Closure Discussion

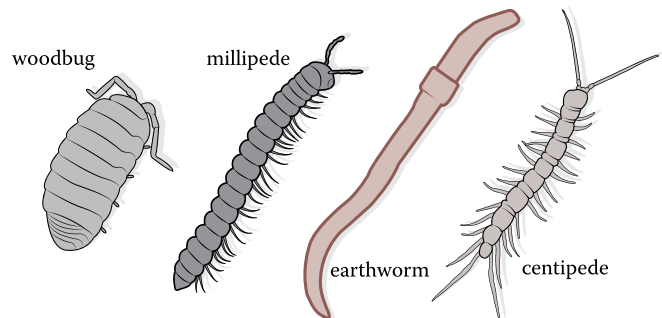
What is soil made of? What is sand? What is clay? What lives in the soil? What is the role of soil animals? (Aerate and mix soil, decompose organic matter, cycle nutrients).

SCIENCE ACTIVITY 3: LIVING COMPONENTS OF SOIL

» explore and identify the different critters that live in garden soil

MATERIALS

- Soil samples with fauna (woodbugs, worms, centipedes, millipedes) from garden or other naturalized area
- Tubs such as recycled plastic salad tubs from supermarket (1 per group)
- Petri dishes, one per group
- Bug jars with magnification or magnifying glasses
- Dissecting microscopes



Hand out a tub of garden soil or other natural soil with soil fauna to each group. Supply students with magnifying glasses, petri dishes and reference books to have a close look at their soil fauna and to identify found organisms. Allow students to explore their soil tubs to find soil invertebrates. Soils may have organisms such as earthworms, woodbugs, slugs, snails, centipedes and millipedes. Students may find worm cocoons and larval stages of some organisms. For older students, one could graph the number of each type of organism found to determine relative abundance.

SCIENCE ACTIVITY 4: SOIL SEDIMENTATION

» see which soil particles are lightest and which are heaviest

MATERIALS

- Large glass jars with lids (one per group – tall thin jars work best)
- 1 cup of soil containing leaf litter, topsoil (1 per group)

Note: Students can use the same soil as in Science Activity 3, provided that as many living organisms as possible have been removed.

- ◀ Each group of students will need a jar with a lid, and 1 cup of soil with organic matter (dead leaves, twigs etc.). Place the soil in the jar and fill up the jar with water. Get students to shake vigorously until it looks like chocolate milk. Get students to draw what they see. Leave jars in a quiet undisturbed place for 24 hours or longer. All the sediments should have settled into layers, based on particle size, with the largest particles on the bottom (sand), followed by silt and finally the top layer will be clay particles (the lightest). Organic matter such as dead leaves and twigs will be floating and the water should look clearer. This helps students to identify the relative proportions of the different sized soil particles (sand, silt and clay).