

Dirt Shake Soil Lab

Standards of Learning

Science 3.1, 3.7

Objective

Students will:

- Investigate soil composition and identify the three main particles of soil.

Materials

- Soil samples – sand, silt, clay
Alternatively you may have students bring in jars of soil samples from their backyards, or you may dig some from the school yard.
- Plastic/glass jars (large mason jars or empty mayonnaise jars work well)
- Water

Background Knowledge

There are three main types of soil particles—sand, silt and clay. When all three are mixed together they create loam. Humus, anything in the process of decaying, is the organic matter found in soil. In this activity, the students will take soil samples, place them in a jar with water, then shake. The soil will settle out in different layers. Sand, being the largest and heaviest soil particle, will settle at the bottom of the container first. Silt, a fine textured soil that feels like talcum powder, settles out next. The final soil, clay, will settle out last. Clay is the smallest and lightest particle of soil. The material floating on top of the water will be organic matter in the process of decaying.

This lesson will review the layers of soil as they are in the ground. On the bottom is bedrock, which is the parent material for the soil that will not be shown until erosion or an earthquake exposes it to the world. Next is subsoil, which is mostly sand/silt and clay. This is where most of the nutrients are found and deep plant roots will come here for water. Next is topsoil, which is where plant roots grow and animals live. This is sometimes called the organic layer where decomposers recycle dead plants and animals into the top layer. On top is humus, which includes more decomposing organic material.

Did You Know?

- Almost all the food you eat, the fiber used to make your clothing, and lumber to build homes is produced by soil.
- One shovelful of soil can contain more species of living things than live in the Amazon rain forest above the ground.
- 6 billion bacteria species can be found living in a cup of soil.
- Farmers use conservation techniques and practices to help maintain fertile soil for planting crops.

Source: <http://www.blm.gov/nstc/soil/Kids/index.html>

Procedure

1. Divide the students into groups of 3 to 4. Provide each group with a soil sample.
2. Have each group place 3-4 inches of the soil into the jar provided. Allow each group to add water to the jar until the jar is $\frac{3}{4}$ full. Tighten the jar lid.
3. Shake the jar vigorously until all the particles are sufficiently wet and separated by the water (about two minutes).
4. Set the jar down and allow the soil to settle.
5. After one minute, observe the amount of soil on the bottom of the jar.



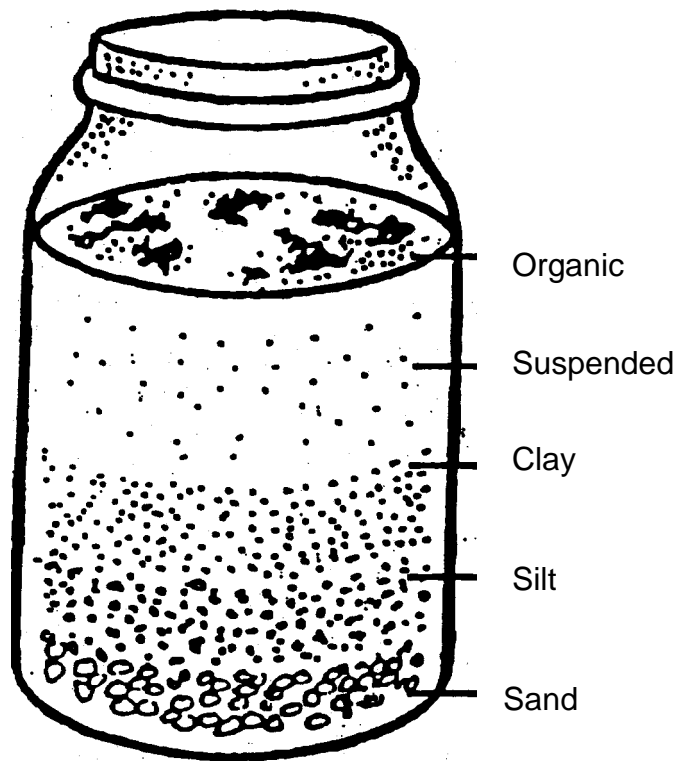
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6. Allow the sample to settle for 3 to 4 hours. Observe the various layers. Create a simple drawing of the different levels.
7. The rest of the soil, mainly clay particles, may take a couple of days to a week to completely settle out. This depends on the amount of clay in the soil sample.

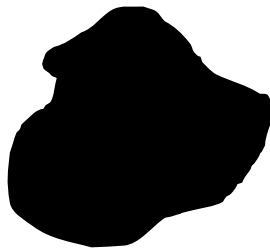
Dirt Shake: Particle Layers



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Particle Size



Sand



Silt



Clay

Relative particle sizes of sand, silt, and clay. Remember, silt and clay cannot be seen with the naked eye.



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