

Sedimentation Jar

Post-visit activity connection to Energizer Weather and Nature

Grade level: **2nd grade** NGSS 2-ESS2-1; CCSS MP.2, MP.5, **4th grade** NGSS 4-ESS2-1; CCSS MP.5, 4.MD.A.1 **5th grade** NGSS 5-EES2-1, 5-LS2-1; CCSS 5.MD.A.1, MP.5

Concepts: process of sedimentation, soil types

Materials needed:

1. Clear glass jar with a lid
2. Plastic cup, 5 ounce size
3. Plastic spoon
4. Toothpick
5. White paper
6. 8 ounces soil from garden or yard
7. Water
8. Potting soil
9. Small pieces of sticks, grass, dried leaves
10. Sand
11. Small rocks or pebbles
12. Disposable gloves for students (optional)
13. Magnifying lenses and/or microscope

Procedure:

1. Have the students dig soil from the school yard in an area that has plants growing. Gather the 8 ounce sample from the same location. (Students could also be asked to bring a sample in a plastic Ziploc bag from home.)
2. Use a plastic spoon to shovel a sample of the school yard soil onto the white paper. Use the toothpick to spread out the particles.
3. Carefully examine the color, composition, and the different sizes of the particles in the soil. Use magnifying lenses and/or microscope for closer observations.
4. Document their findings on their papers using drawings and written descriptions.
5. Repeat steps 2-4 with the sand and potting soil.
6. Before the students begin the experiment, have each student write or draw the order they think the materials will settle.

7. Pour 4-5 ounces each of the garden soil, potting soil, and sand into the jar. Using a five-ounce plastic cup, place in approximately 2-3 ounces each of pebbles and grass, leaves and sticks
8. Fill the jar with water leaving about $\frac{1}{2}$ inch at the top.
9. Screw the lid on tightly.
10. Shake the jar for 1 minute until all the soil is mixed with the water. Observe what happens when the soil begins to settle. Record your observations. Prepare a form with the following questions for first observation immediately following shaking the jar, then 30 minutes later, 1 hour later, 2 hours later, and 24 hours later:
 - a. How is the soil settling in the jar?
 - b. Are any lines or layers visible?
 - c. What materials are on the bottom?
 - d. What materials are on the top?
 - e. Draw a sketch of your jar.

What's Happening:

Sediment is a naturally occurring material that is broken down by processes of weathering and erosion, and is subsequently transported by the action of wind, water, or ice, and/or by the force of gravity acting on the particles. For example, silt falls out of suspension via sedimentation and forms soil (some of which may eventually become sedimentary rock).

The top layer of soil is made up of living and decomposed materials like leaves, plants, and bugs. This layer is very thin and is usually pretty dark.

The next layer, called topsoil, is made up of minerals and decomposed organic matter and it is also very dark in color. This is the layer that many plants roots grow in.

The next layer, called subsoil, has clay and mineral deposits and less organic materials than the layers above it. This layer is also lighter in color than the layers above it.

The layer, called regolith, is made up of slightly unbroken rock and only a little bit of organic material is found here. Plant roots are not found in this layer.

Book List:

1. Dirt-The Scoop of Soil by Natalie Rosinsky (K-4)
2. Life in a Bucket of Soil by Alvin Silverstein (3-8)
3. Soil by Christin Ditchfield (2-6)

Extension Activities:

1. Students can do a stop-motion video presentation of the settling of sediment.

2. The students can write an article for a gardening magazine using what they have discovered to give advice on how to make soil better for plants.
3. Repeat the experiment using different soil types and put soils in the jar in a different order before adding water and shaking.