

Soil Types & Textures

Objectives:

Students will!

- Examine and identify the 3 major components of soil: sand, silt, and clay
- See the difference in soil composition between garden soil and on-site sand/dirt

Educator Notes

- For baseline knowledge on the components of soil, read the *Background For Teachers* section in the Utah Education Network's lesson plan "The Dirt on Soil" (link located in SOURCES on the next page)
- Remind students not to touch their faces or eyes, since they will be touching soil and dirt
- Let the students wash their hands thoroughly upon completion of the activity

Materials:

- From a garden supply store: samples of sand, silt, and clay
- From on-site (the school, playground, etc.): samples of garden soil and sand/dirt from the playground
- 3 bowls or small bins to hold the soil samples
- Measuring utensils
- Table salt (2 tablespoons)
- Laundry detergent (2 tablespoons)
- 1 cup of garden soil
- 1 cup of on-site soil
- 6 cups of water
- 2 straight-sided glass quart jars with lids
- Magnifying glasses

Preparation:

Get samples of sand, silt, and clay from a local garden supply store. Separate these samples into 3 bowls or small bins. Label these bowls so that students do not forget what type of soil they are exploring in the first part of the activity. Collect samples of garden soil and sand/dirt from the schoolyard. Have 2 glass quart jars ready, as well as a source of water to add to the soil mixture. If pressed for time, add 1 tablespoon of table salt and 1 tablespoon of laundry

detergent to each jar before the lesson begins. This can be used as an opportunity to further engage the students by giving them measuring tasks and allowing them to make the additions.

Key Vocabulary:

soil | textures | silt | clay

Activity:

Introduce students to the 3 major components of soil: sand, silt, and clay. Have a container ready with samples of each and allow students to explore the differences between the soil types by feeling their textures and looking at them through magnifying glasses or with the naked eye. Ask students to describe how they are different. Write these differences down on a blackboard or piece of butcher paper. Put a cup of garden soil into a glass quart jars. Add 1 tablespoon of table salt and 1 tablespoon of laundry detergent. (These work to disperse the negative charges of the clay particles and help eliminate binding between different soil particles.) Add water until the jar is almost full. Secure the lid tightly and shake, shake, shake! Allow each student to help. Next, put the jar where it won't be disturbed. As the particles settle, sand will reach the bottom first, silt will be next, and clay will settle on top. Follow the same procedure for the second jar, this time with on-site soil/sand. When the water is clear and all particles have settled, students can see how the different soil types have formed separate layers based on their weight and size. Have them guess which layer belongs to which soil type. Note how the soil composition from the site soil/sand is different from that of the garden soil!

Wrap-Up:

By the end of this activity, students will have been able to observe with their eyes and feel with their hands some of the differences between types of soil. Soils from different places have different soil compositions. In other words, the relative amount of each soil type per cup of soil can be very different depending on where your soil comes from. You may also want to explain that in addition to soil particles, soil is made up of water and air (important for both the plants and critters that live in it) as well as organic matter: living or once-living material.

Extension Activity (K-5):

Older students can write down the observations they make in their sensory exploration of the different soil types. Students may also draw diagrams of the jar activity, labeling the different soil layers and their relative depths. This activity can also be used as a math exercise by having

students indicate which fraction of the total sample each soil component makes up. This can be done by measuring the height of the different soil layers and dividing by the depth of the whole sample.

Sources:

<http://www.uen.org/Lessonplan/preview.cgi?LPid=18972>