

SCRUMPTIOUS SOIL

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SUBJECTS: Science

STUDENT SKILL: The student will engage in investigations that lead to the discovery that earth materials consist of rocks, soils, water, and air.

OBJECTIVE: Students will build models of soil profiles, using breakfast cereal and other edible materials.

BACKGROUND

When you dig into the ground under the grass in your yard, you'll find soil. But what happens if you keep on digging? If you dug far enough, would you run out of soil? How far would you have to dig before you ran out? And what would you find there?

If you dug far enough, you would hit solid rock. This is called bedrock. But before you got there you would have to dig through three different layers of soil. The first layer would be nothing but dark-colored organic materials. That is the layer formed by plants and insects that have died and dead leaves that have fallen. Just under that is the topsoil. The topsoil is the best place for plants to take root and grow. It is a mixture of air, water, organic material and minerals.

Minerals come from rocks. Minerals have several different ways of getting into the soil. Sometimes they come from the ashes of volcanoes that have erupted. Usually the minerals come from rocks that have been broken apart. Water from rain flows into the cracks of rocks. When the water freezes, it expands and causes the cracks in the rocks to be bigger, and little bits of rock break off. Sometimes the roots of plants will grow into the rocks and cause them to break. Many rocks are broken apart by lichens — tiny plants that live on rocks. Sometimes water just keeps running over the rock until tiny particles start to wash away. We call all these processes “weathering.” Water and wind carry the tiny bits of rock along until they get trapped by the soil. It can take hundreds of years for rocks to break into pieces that are small enough to form soil. It takes between 200 and 500 years for just one inch of topsoil to form.

In most places the topsoil is between six and 20 inches thick. If enough of the topsoil blows or washes away, the farmer is left

MATERIALS

clear plastic cups

breakfast cereal,
some crushed,
some whole

shredded coconut

1/2 gallon milk

plastic spoons



VOCABULARY

soil
bedrock
mineral
organic
topsoil
subsoil
material
weathering
lichens

with subsoil. The subsoil is the layer below the topsoil. It is usually lighter in color and less productive than the topsoil. It is made mostly of clay or sand and has very little organic material. Plants have a hard time growing in subsoil. That's why farmers have to work so hard to conserve their topsoil. Between the subsoil and the bedrock you will find a layer of small rocks that have started to break off the bedrock. This layer is called the parent material of the soil. That's because most of what makes up the soil was once part of the rock.

ACTIVITY

1. Have students bring samples of soil from their own yards, or take buckets and trowels outdoors to dig samples from the school yard.
2. Give students time to examine the soil. Ask how the soil feels, looks and smells. List answers on the chalk board.
3. Lead a discussion about soil. ("What is soil for? Have you ever played with it? How? Have you ever eaten it? How did it taste? What happens when it gets wet? What happens when it gets cold? What happens to it when the wind blows?")
4. Share the background information above as you build a soil profile from cereal. Explain that the plastic cup represents the parent material, the whole cereal represents the subsoil and the crushed cereal represents the topsoil. Sprinkle coconut on top to represent grass or other plant material.
5. Have students wash their hands and make their own soil profiles. As you pour milk, have students observe to see how water moves through the "soil."

ADDITIONAL ACTIVITIES

Make dirt cake. (See "Recipes.")

EXTRA READING

Ray, Mary Lyn, and Lauren Stringer, *Mud*, Harcourt Brace, 1996.
Stille, Darlene, *Soil Erosion and Pollution*, A New True Book, Children's Press, 1990.

Wallace, Bill, *Danger in Quicksand Swamp*, Minstrel, 1991.

Wilkes, Angela, *My First Nature Book: A Life-Size Guide to Discovering the World Around You*, Knopf, 1990.

EVALUATION

Were students able to complete their soil profiles and understand the composition and function of soil?

Oklahoma Ag in the Classroom is a program of the Oklahoma Cooperative Extension Service, 4-H Youth Development, in cooperation with the Oklahoma Department of Agriculture, Food and Forestry, and the Oklahoma State Department of Education.

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