

Activity: Make and Eat Soil Profile

Activity Level: Basic

Source: Alaska Agriculture in the Classroom eSchooltoday

Purpose

Students will use a hands-on model to build a soil profile.

Example Topics It Supplements

Human impact on physical and living environments;
earth science (including the Water Cycle)

Activity Snapshot

1. Organize and Prepare Supplies
2. Read Background Information
3. Interest Approach
4. Conduct Activity
Using breakfast cereal, a mock soil profile will be constructed showing different layers of soil. Soil in different places can be very different, but most soils can be divided into layers. This activity illustrates the different characteristics of a soil profile.
5. Ask follow up questions and make the connection to agriculture
 - What are the different soil layers we made in our soil profiles?
 - What are some factors that could make each horizon slightly or very different from the other above or below it?
 - Why is it important to preserve and take care of our soil? Why is soil quality important in agriculture?

State Standards It Supports

SC 2.4.2.a—Describe Earth materials.
SC 5.4.2.a—Describe the characteristics of rocks, minerals, soil, water, etc.
SS 1.3.5.b—Match resources to their sources.
SS 1.3.5.c—Identify environmental issues related to the physical environment.

Materials

- 4 different types of cold breakfast cereal—2-3 Tbsp. per student
(*Kix, Rice Krispies, Cocoa Krispies, & Raisin Bran*)
- Large clear plastic cup—1 per student
- Milk—1/3 cup per student
- Spoons—1 per student

What's the Connection to Agriculture?

Taking care of our soil is important because if we do not take care of it, there is nowhere to plant crops and trees. We need crops to feed animals and humans and trees to provide many of our basic needs. Farmers strive to be good stewards of the land to protect and use soil wisely to produce food, fiber, and fuel.

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PROCEDURE:

1. Organize and Prepare Supplies
See “Materials” on cover page.

2. Background Information

If one could dig a massive trench, about 50-100 feet vertically downwards into the ground, you will notice that you would have cut through various layers of soil types. A look at the layers from a distance gives one a cross-section view of the ground and the kind of soils and rocks it is made up of. This is called a soil profile. The profile is made up of layers, running parallel to the surface, called soil horizons.

3. Interest Approach

Pose the question: What would you expect to see if you dug a hole straight down in to the ground?
Expected responses: Vegetative cover like grass, debris such as leaves and twigs, topsoil that is dark and smooth texture (sand, silt, and clay), subsoil that is lighter in color and can be a rougher texture, and rocks.

4. Conduct Activity

Using breakfast cereal, a mock soil profile will be constructed showing different layers of soil. Soil in different places can be very different, but most soils can be divided into layers. Large, light colored cereal (like Kix) make good parent material; smaller light-colored cereal (like Rice Krispies) make good subsoil; smaller darker-colored cereal (like Cocoa Krispies) makes good topsoil; cereal with texture (like Raisin Bran) makes for a good leaf litter layer.

Distribute supplies and build a soil profile.

- a) First, place about 2-3 tablespoons of Kix cereal in the cup. These are like the rocks in the ground.
- b) Next, place about 1-2 tablespoons of Rice Krispies in the cup. This is the subsoil, which is not as dark and rich as the topsoil.
- c) The topsoil comes next. Use the Cocoa Krispies to represent the rich earth; add 1-2 tablespoons.
- d) Next, sprinkle some of the Raisin Bran on top to represent leaves and debris.
- e) Look at the soil profile! Look at each layer—rocks, subsoil, topsoil, leaves/debris.
- f) Pour about 1/3 cup of milk on the cereal. Watch the milk as it flows through the cracks to the bottom of the cup. That is called percolation. That’s when the water fills up the spaces between the soil particles. If the space is all filled up the ground is soggy or even flooded. When the ground is frozen, the water cannot go all the way to the aquifer (groundwater) beneath and within the parent material layer.
- g) Eat your soil profile!

5. Ask follow up questions and make the connection to agriculture
 - What are the different soil layers we made in our soil profiles?
Rocks, subsoil, topsoil, leaves/debris.

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- What are some factors that could make each horizon slightly or very different from the other above or below it?
Each horizon tells a story about the makeup, age, texture, and characteristic of that layer.
- Why is it important to preserve and take care of our soil? Why is soil quality important in agriculture?
Taking care of our soil is important because if we do not take care of it, there is nowhere to plant crops and trees. We need crops to feed animals and humans and trees to provide many of our basic needs. Farmers strive to be good stewards of the land to protect and use soil wisely to produce food, fiber, and fuel.

Soil also serves the very important function of filtering water as it percolates through the soil. Percolation also allows water to reach the roots of plants.