

Make & eat soil profile

Materials

- at least four different types of cold breakfast cereal, such as Kix, Rice Krispies, Cocoa Krispies and raisin bran
- large clear plastic cups
- milk
- spoons

Objectives

Explain soil profiles and layers and introduce the concept of percolation.

Suggested grade levels

K-4

Alaska Content Standards

Science A14; B1; D1.



This project presented by Alaska Agriculture in the Classroom through funding from the Alaska Division of Agriculture and the Alaska Farm Bureau. For information, visit www.agclassroom.org/ak



Note: Streamline introduction for younger students.

Introduction

What's a soil profile?

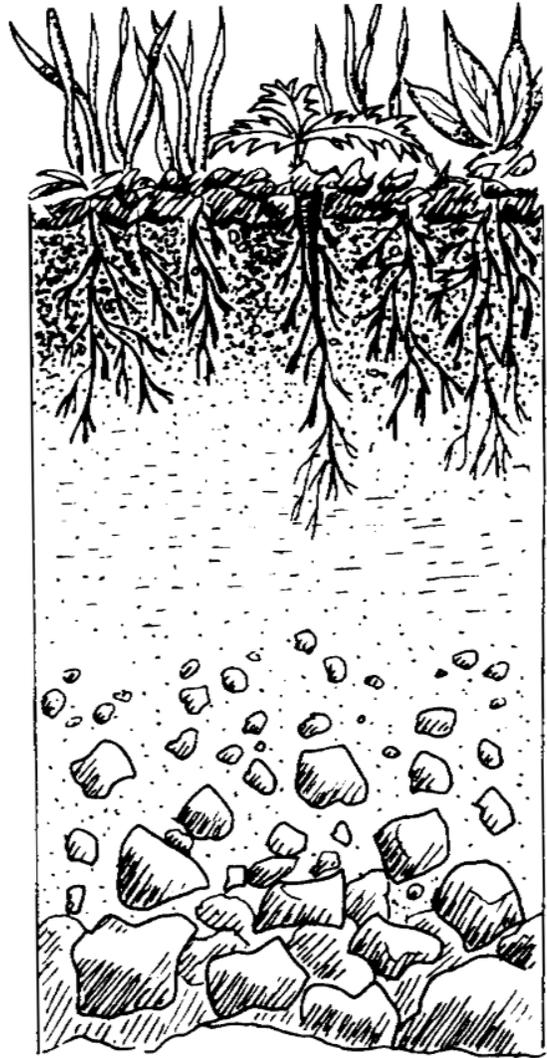
Just like people have profiles: a forehead on top, a nose in the middle and a chin at the bottom, so do soils. Scientists look at soil profiles by boring holes with a metal tube. Another way to look at a soil profile is to look in a freshly dug deep hole.

What you'll see is different layers of soil. The very top layer is the debris — dead leaves, bugs, bark, etc. — that lays on top of the form. It will form humus as it decays.

The first layer of the actual soil is the Topsoil or A layer. This is the fertile humus layer, and much of the soils nutrients are here. Plants roots go into this layer, and it is from this layer that they get their nutrition.

The second layer is the subsoil, or B layer. Trees put their roots into the subsoil. It gives them additional water and provides them with a good anchor. But there are not as many nutrients in this soil. It is generally lighter colored than the topsoil. You can generally see a definite color change between the topsoil and subsoil.

Under the subsoil is the parent material, or C layer. These are the rocks that wear away to form soil. This can take thousands of years. Aquifers, or streams of underground water, often run through the parent material.



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Terms to Define

topsoil
 subsoil
 parent material
 fertile
 humus
 nutrients/nutrition
 aquifer
 percolation
 boring
 filter



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Directions

Remember: Have students wash their hands; check for food allergies.

Let's make a profile. Today cereals will take the place of real soil in our profiles. Which cereal do you think should be which layer?

Large, light-colored cereals like Kix make good parent material; smaller light- or medium-colored cereals like Rice Krispies make good subsoil. Use a darker cereal like Cocoa Krispies for the top soil. Something with texture, like raisin bran, makes a good leaf litter layer.

Have students place the layers in their cups, reminding them they will need just a small amount (about 1/4 cup) of each soil layer, and just a sprinkling of the debris cereal.

We talked about how plants and trees get their water through the soil. But what happens when it rains? The water moves through the soil in what scientists call percolation. The water fills up the spaces between the soil particles. If the space is all filled, the ground is soggy or even flooded. When the ground is frozen, like it is in the spring time in Alaska, the water cannot go all the way to the aquifer in the C layer, so we have puddles of water standing on the ground. When the ground thaws, this water goes in the ground.

Percolation is not just important because it allows water to reach the roots of plants. It is also very important because the soil filters the water as it percolates through.

What will happen when you pour milk on your cereal profile?

The milk will flow through the layers and accumulate in the bottom. If the students put in too much milk, the whole profile will be soggy. Pour milk into the students cups and while they watch the percolation. Students may eat their profiles.

Related websites

<http://www.florence.ars.usda.gov/kidonly/hb.htm>
<http://www.nrcs.usda.gov/feature/education/squirm/skworm.html>
<http://soils.usda.gov/education/resources/main.htm>
<http://www.WTAMU.EDU/~crobinson/DrDirt.htm>
<http://school.discovery.com/schooladventures/soil/index.html>
<http://www.florence.ars.usda.gov/kidonly/hb.htm>

Related lesson

"It's all dirt, right?" for older students

Adapted from other materials, including those of Utah Ag in the Classroom.