

Overview and Purpose

The purpose of this activity is for students to identify soil properties and to use these properties to assess soil for its ability to support plant life.

Educational Standards Addressed:

Kentucky Core Content SC-EP-2.3.1

- *Students will describe earth materials (solid rocks, soils, water and gases of the atmosphere) using their properties.*
- *Earth materials include solid rocks and soils, water and the gases of the atmosphere. Minerals that make up rocks have properties of color, luster, and hardness. Soils have properties of color, texture, and capacity to retain water and the ability to support plant growth. Water on Earth and in the atmosphere can be a solid, liquid, or gas.*

Kentucky Core Content SC-04-2.3.1

- *Students will:*
 - *Classify earth materials by the ways they are used;*
 - *Explain how their properties make them useful for different purposes.*
 - *Earth materials provide many of the resources humans use. The varied materials have different properties that can be used to describe, separate, sort and classify them. Inferences about the unique properties of the earth materials yield ideas about their usefulness. For example, some are useful as building materials (e.g., stone, clay, marble), some as sources of fuel (e.g., petroleum, natural gas), or some for growing plants we use as food.*

Objectives:

Students will:

- Identify properties of soil in different samples
- Explain how soil properties make the soil useful and/or not useful for plant life
- Predict which soil samples will best support life
- Chart plant growth for a specific period of time

Materials:

- | | | |
|--------------------------------------|-----------------------|----------------|
| • Various soil samples | • Graduated cylinders | • Pencil |
| • Clear plastic containers with lids | • Timer | • Ruler |
| • Water | • Small plants | • Paper towels |
| • Planter cups with saucers | • Chart paper | |

2007

Winning Lesson Plan
from Corbin, Kentucky

It's Just Dirt, Isn't it?

by Andrea Broyles
South Elementary

Subject: Earth Science -
Properties of Soil

Grade Level: 3–4

Duration: Three One-Hour
Class Periods

Procedures

Prior to performing this activity, I have my students bring in a couple of cups of soil from various places. If they are going on a vacation, I ask them to bring in dirt from each state that they pass through making sure they label each sample as to its location. I do not explain why I want the dirt, only that we will be using it for an upcoming science unit. Make sure students have a specific date to bring in the soil samples. This step allows students to take ownership in their experiment. It also promotes parental involvement. However, soil samples can be purchased through various science catalogs.

Day 1:

After I have obtained samples of soil from several states, I place each sample in a clear plastic container with a lid. I then label each container with the state that the sample came from.

As students bring samples of soil to class, discussion automatically begins about the property of color. Most children this age assume that dirt is dirt, meaning that it is all the same. At an instant, students will be able to see several different colors of soil. On chart paper, list each state represented with soil samples. Have students describe the color of each sample. Record their responses. At this time I tell students that one property of soil is color.

Day 2:

Students are given a labeled plastic container of soil. They are to record on chart paper the state they have. Then, students are to open the container, pour a small amount onto a work area (I use small plastic trays), and “play” (experiment) with their soil. They will undoubtedly touch it. Have the students record their observations on the chart paper. To save on time and mess, have the students trade seats (work stations), leaving the soil samples and chart paper behind. When students arrive at a new seat, they are to once again “play” in the dirt. Then, they are to add to the list of observations about that particular sample. Continue rotating students through the various samples until all students have had an opportunity to experiment with all samples. Discuss together as a group the students’ findings. At this time I tell the students that they have just discovered the property of texture.

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Procedures (Cont'd)

Day 3:

Place students in small groups. Give each group a soil sample, planter cup (cup with drainage holes), and a graduated cylinder of water. Instruct students to pour the soil into the planter cup. (Be careful – Florida’s soil is very sandy and will pour out of the holes instantly. Make sure there is a saucer under the planter cup before the soil is poured in.) Have students notice the measurements on the graduated cylinder. Discuss the importance of accurate measurement. Instruct the students to pour 5ml of water into the planter cup. Wait 2 minutes. On chart paper, record observations. Pour in an additional 5 ml of water. Wait 2 minutes. On chart paper, record observations. Continue with this cycle until samples either have water draining or water standing on the surface. Discuss the students’ observations. Introduce the word “permeability”. Explain that the capacity to retain water is a property of soil. Have students infer which soils would best support life based on their findings.

Extensions:

Plant a small plant in each of the soil samples. Make sure the same type and size of plant is used for all samples. Have students predict which soil samples will most likely support the plant’s growth and which ones will not based on the soil’s properties. Record. Carefully measure the amount of water given to each plant daily. With a ruler, measure the growth of the plant. Record. Also, record any additional observations. Continue this activity for several weeks or throughout the year. After there is a noticeable difference in the plants, go back and refer to the students’ predictions. Discuss the results.

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