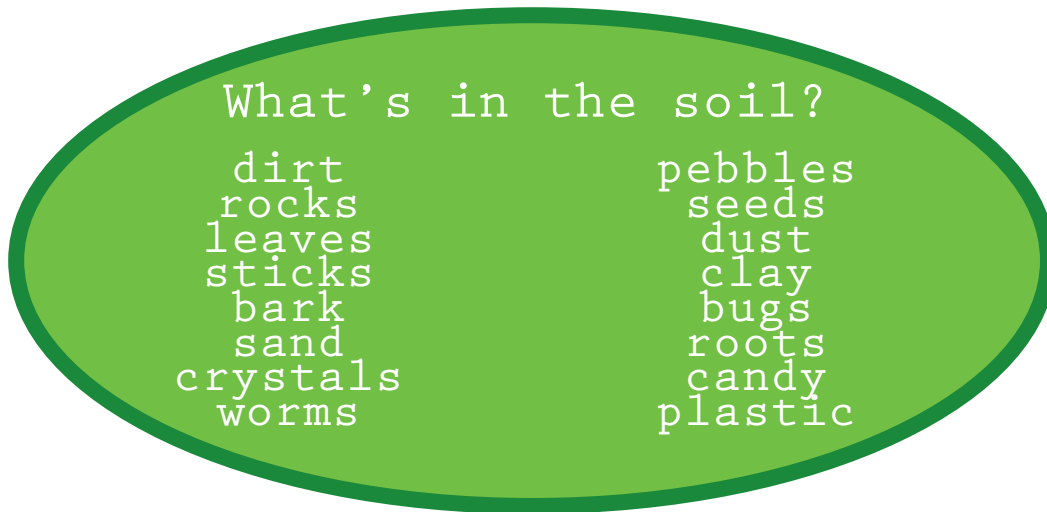


Soil Detectives

Objective:

Students examine a sample of soil and sort the various components to discover the variety of items that make up soil. Students will also classify ingredients into two major categories: plant and mineral.



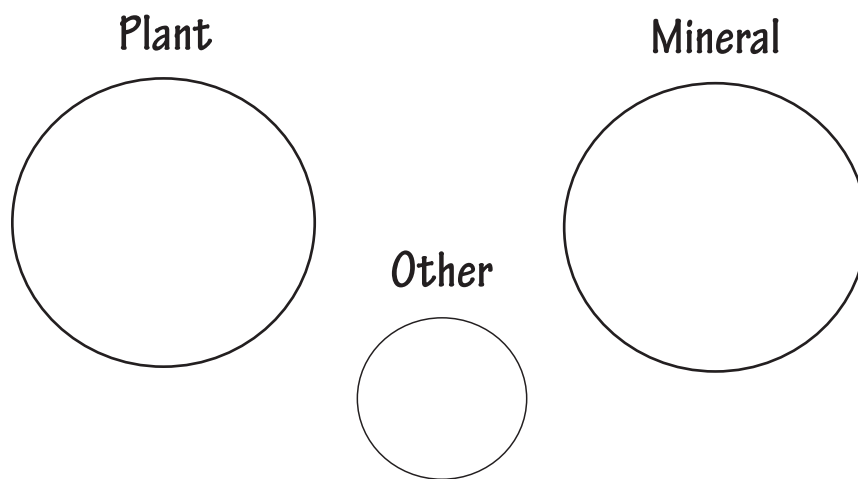
Materials needed:

Popsicle sticks	Poster board	12"x 18" paper	Plastic spoons
Magnifiers	Journal or notebook	Bug box	Pencils/crayons/markers
4 soil samples (about 3 cups each)		"Soil Observations" worksheet (page 3)	

Procedure:

1. Before class begins, collect soil samples from several areas that haven't been watered recently. Dry garden soil is easier to sort and contains fewer soil organisms.
2. Make a chart entitled "What's in Soil?" on the board. (See list above for some examples). On another board, make a line dividing the space in half vertically. Title the left side of the chart "Plant" and "Mineral" on the right side.
3. Ask the class why they think soil is important, i.e., plants grow in it, we walk on it, animals live in it, etc. Point out that soil is a mixture of many different things, some of which traveled many miles before ending up in the schoolyard.
4. Ask the students to predict items they might find in a spoonful of soil and list these on the board. This list will give everyone ideas about the things they might find in their own samples.
5. Explain that scientists and farmers talk about the soil because the quality of the soil's ingredients determines the quality of the plants that grow in it. Review the needs of plants with the students, emphasizing water and nutrients, both of which are held in the soil. An even mixture of plant and mineral debris is best.
6. Define the term "plant" as items that came from plants such as roots, leaves, sticks, seeds, and bark. "Minerals" constitute rocks, sand, pebbles, crystals and clay, all of which are important for plant growth.

7. Divide the students into pairs and explain that each group will study a small soil sample, sorting their items into the two major categories: plant and mineral. Each group will receive an 12" X18" paper and will draw two big circles (see example below). Label one "plant" and the other "mineral". Show the students that they will use their toothpicks to drag an item, such as a leaf over to the plant circle, or a pebble to the mineral circle. If there is an item doesn't fall into those categories (e.g., a dead animal, trash), tell the students to draw a third circle and label it "other".
8. Distribute the equipment and direct everyone to collect their soil samples and place a spoonful of soil between the two circles. Distribute one magnifier to each group. As you circulate among the class, ask students why they sorted particular items in the "plant" or "mineral" category.
9. If students find any critters, point out that most soil organisms are good and harmless. Encourage children to gently collect their critters in a "bug box" to share with the group, and to release in the garden at a later time.
10. Ask how their soil samples compare with the class's predictions. Did they find examples of each thing listed on the board? What new kinds of items did they find? Were there items that didn't fit in either the "plant" or "mineral" category (toys, trash)?



Analyzing the Data:

1. Ask a group to share the items they found and how they classified it: plant or mineral. Write it in the appropriate column. Now ask for a show of hands of those students who also found this material in their sample. Record this number next to the item.
2. Once the entire class has reported their results, discuss the following findings:
 - * What soil item was reported most often? What item was reported least often?
 - * Which category had the most items?
 - * What type of soil would be better for growing plants? Why?
3. Ask students to create a two-part name for their soil, using a plant and a mineral characteristic (leafy-sand or twiggy-clay).

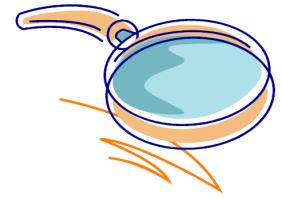
Extension Activity:

Compare soil samples from other areas around the school using the "Soil Observations" worksheet on page 3. Divide the students into groups and have them compare their observations. Engage the entire class in a discussion about why the soil samples were different and/or similar. To take the activity a step further, students could also compare the types of plants growing in each area and research what types of soils these plants prefer.


Name _____

Date _____

Soil Observations



Use the questions below to describe the soil.

<p>Is the soil moist or dry?</p>	<p>Feel the texture of the soil – does it feel like clay or sand?</p>
<p>What color is the soil?</p>	<p>Does the soil have rocks in it? If so, are they small, medium or large? Are there a few rocks or many?</p>
<p>Does the soil have bugs or other living things in it?</p> 	<p>Does the soil have leaves or other organic matter in it? How much?</p>