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Soil in a Jar

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Topic
Soil

Key Question
How do soil layers compare?

Learning Goals
Students will:
1. observe and compare layers of soil, and
2. draw the layers of soil after the jar has been shaken.

Guiding Documents
Project 2061 Benchmark
- *Chunks of rock come in many sizes and shapes from boulders to grains of sand and even smaller.*

NRC Standards
- *Earth materials are solid rocks and soils, water, and the gases of the atmosphere. The varied materials have different physical and chemical properties. which make them useful in various ways, for example, as building materials, as sources of fuel, or for growing plants we use as food. Earth materials provide many of the resources that humans use.*
- *Soils have properties of color and texture, capacity to retain water, and ability to support the growth of many kinds of plants, including those in our food supply.*

Science
Earth science
geology
soils

Integrated Processes
Observing
Predicting
Recording
Comparing and contrasting
Communicating
Classifying

Materials
For each group:
small clear plastic jar with lid
hand lens

For the class:
water
varied soil samples
reclosable plastic bags
crayons or colored pencils
student sheets

Background Information
Soil is the very thin layer of material that covers most of the dry land of the world. It is one of our most valuable resources. There is a technical difference between soil and dirt. Soil contains organic matter; dirt is material from rocks. Plants root in the soil and get their nutrients from the minerals there. Animals get their nutrients from the plants or animals that eat the plants.

This activity allows students to observe the particles in a small amount of soil from the schoolyard. They will mix soil and water in a bottle and then observe the layering of the soil as it settles. They will be able to see which particles settle first and their different shapes and sizes.

Management
1. Before beginning this activity, gather soil samples from several areas around the schoolground or get samples from a park. Put each soil sample in a reclosable plastic bag. If your schoolground has a poor mixture of soil types, you may have to supplement the soil samples with sand or humus.
2. Provide enough small clear plastic jars with lids so each group can have at least one. The lids must screw on tightly.

Procedure
1. Ask the students what they know about soil. Question them about the differences between soil and dirt. Record their responses on the board.
2. Give each group of students a small bag of soil. Tell them to observe the soil carefully. Ask them if they think all of the soil is the same.
3. Provide each group with a small clear plastic jar that has a lid that can be tightly screwed on.
4. Instruct the students to take some soil from the plastic bags and fill their jars about one–third full. Hand out the student sheets and instruct students to observe, draw, and describe the soil in the jar.

5. Have them predict what they think will happen when they add water and shake the jar. Instruct them to draw and describe their predictions in the appropriate spaces on the second student page.
6. Guide students to add water to their jars until they are almost full.
7. Instruct the students to tightly screw the caps on the jars. Walk around to each group and verify that the jars are well sealed. Have students shake their jars 20 times.
8. Suggest that students place their jars on a table and not move them for about five minutes.
9. Ask them if all the material in the soil settled.
10. Direct them to draw and describe their soil samples after the soil settles.
11. Discuss with the students what has happened to the soil. Ask them to describe the different layers.
12. Invite them to use hand lenses to take a closer look at the layers of soil.
13. Question the students about what would happen if the jars were shaken again—would the layers be the same?
14. Have the students compare their jars with others in the class. Do they have the same layers of soil?

Discussion

1. How did your soil look before you added water?
2. What predictions did you make about how your soil would look after you added water?
3. Were your predictions correct? Why or why not?
4. Describe the layers of soil you saw in the jar after you added water, shook it, and let it settle.
5. What layer contains the larger pieces of gravel? Can you explain why?
6. What kind of things were in the soil?
7. Do you think that all the jars in the classroom had the same layers of soil? Why or why not?

Evidence of Learning

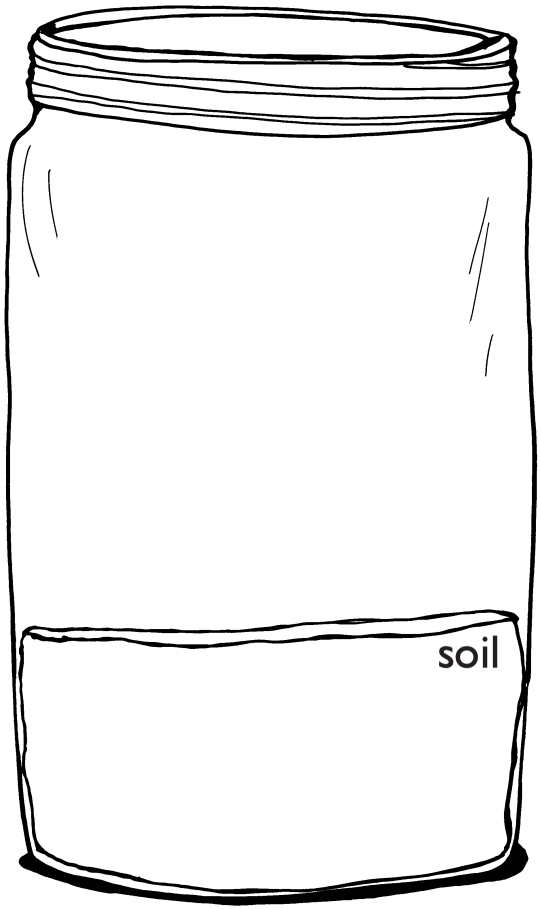
1. Students explain what happened to the soil in the jar.
2. Students explain why there were several layers in the soil they observed.

Soil in a Jar

1. Look at the soil. Draw and describe what you see.
2. On page two, draw and describe what you think will happen when you add water and shake the jar.
3. Add water until the jar is almost full.
4. Put on the lid. Shake the jar 20 times and put it down. Let it sit for a while.
5. Look at the soil in the jar again. Draw and describe what you see on page two.

Draw

Describe

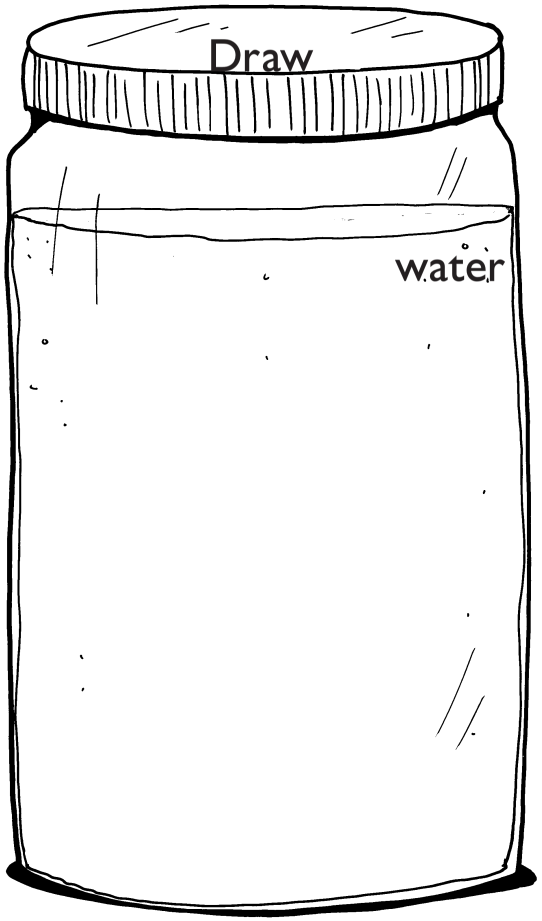


Before Shaking

Soil in a Jar

What I think will happen:

Draw

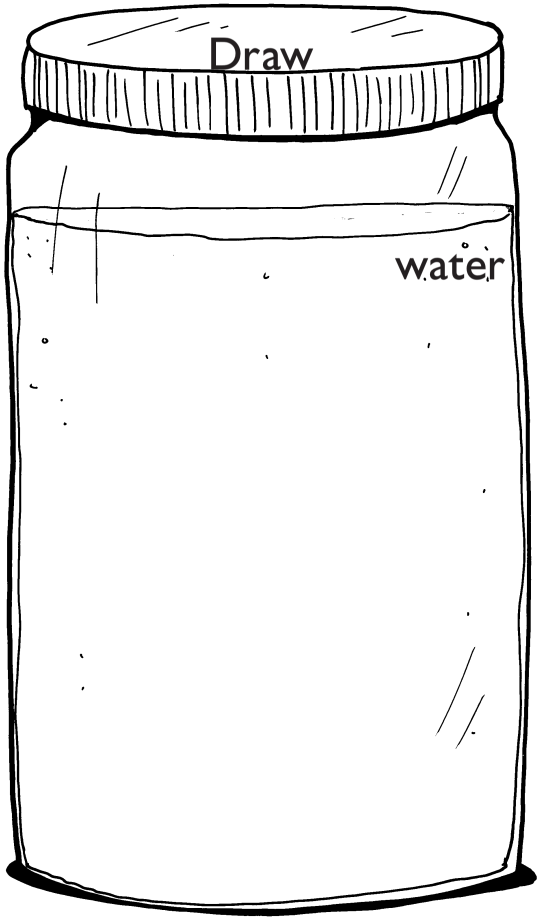


Describe

After Shaking

What did happen:

Draw



Describe

After Shaking