

# 4

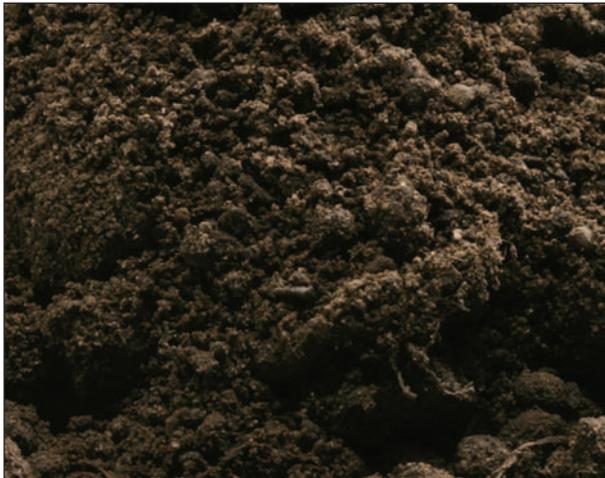
## Soil Columns



**S**oil found in one place can be very different from soil found somewhere else. This can be true even if the two places are quite close to each other, because the soils may have different ingredients. The specific ingredients in a soil are referred to as its **composition** (com-po-ZI-shun). One way to learn more about a soil's composition is to mix it with water in order to separate the materials in the soil.

### CHALLENGE

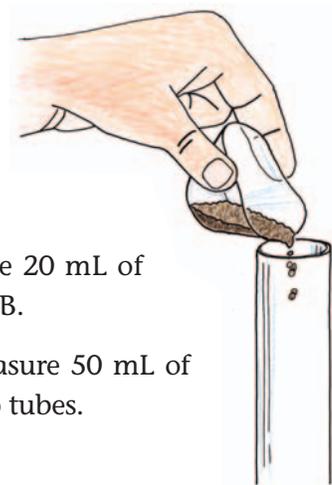
How does the composition of soils vary?



MATERIALS	
	<p><i>For each group of four students</i></p> <ul style="list-style-type: none"><li>1 sample of Soil A</li><li>1 sample of Soil B</li><li>1 cup of water</li><li>1 SEPUP tray</li><li>2 large clear plastic tubes with caps</li><li>1 magnifying lens</li><li>1 30-mL graduated cup</li><li>1 50-mL graduated cylinder</li><li>1 plastic spoon</li><li>1 ruler</li></ul>
	<p><i>For each student</i></p> <ul style="list-style-type: none"><li>1 Student Sheet 4.1, "Soil Column Observations"</li></ul>

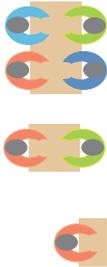
## PROCEDURE

1. Place one tube in Cup A of the SEPUP tray. Place another tube in Cup B.
2. Use the 30-mL graduated cup to measure 20 mL of Soil A. Pour this soil into the tube in Cup A.  
**Hint:** Squeeze the cup slightly, as shown at right, to make pouring the soil into the cylinder a little easier.
3. Use the 30-mL graduated cup to measure 20 mL of Soil B. Pour this soil into the tube in Cup B.
4. Use the 50-mL graduated cylinder to measure 50 mL of water. Add 50 mL water to each of the two tubes.
5. Cap each tube.



6. Place your thumb over the cap and gently shake each tube 10 times.
7. Stand the tubes back in the correct cups of the SEPUP tray and observe the changes that take place inside each tube.
8. On Student Sheet 4.1, “Soil Column Observations,” record your observations for 5 minutes or until you observe no more changes taking place inside the tubes.  
**Hint:** Be sure to lift each soil tube from the SEPUP tray to see the entire tube while making your observations.
9. Use your ruler to measure the height of each soil section. Record your height measurements on Student Sheet 4.1.
10. Sketch and describe the appearance of the contents of each tube on Student Sheet 4.1.

## ANALYSIS



1. How were the sections in Tube A similar to or different from the sections in Tube B? Support your answer with your observations.
2. Were the particles at the bottom of Tube A larger, smaller, or the same size as the particles at the top?
3. Is the composition of Soil A the same as that of Soil B? Support your answer with evidence from this activity.

## EXTENSION

Use Student Sheet 4.1, “Soil Column Observations,” to estimate the percentage of each layer of material in the overall soil composition. Explain why this calculation is only an estimate.