Sedimentation for Soil Texture

OVERVIEW

Soil texture is an important aspect of soil and is important for plant growth. This activity will provide a more quantitative measure of soil texture. Using the soil characterization protocol will only give a basic description of the soil. To expand on soil, you can use this bottle method to determine how much sand, silt or clay is in the soil.

OBJECTIVES

At the conclusion of the lesson, students will be able to identify that clay, sand and silt are different components in soil.

LENGTH OF LESSON

This lesson will take one 40 minute class period. It can take a long time to let the sediment settle. This activity may need to be revisited later in the day or the following day.

GRADE LEVELS

This lesson is most appropriate for the middle school classroom and elementary.

STANDARDS COVERED

E.SE.06.13 Describe how soil is a mixture made up of weathered eroded rock and decomposed organic material.
E.SE06.14 Describe different soil samples based on particle size and texture.

MATERIALS

Soils from BEST Plots
8 oz. straight-sided bottle
Stop watches

BACKGROUND

See soil characterization for background

RESOURCES

http://gardenline.usask.ca/misc/soil.html (This is a simple explanation of the role of different soil texture types).
http://soils.usda.gov/education/ (The educational website developed by the Natural Resource Conservation Service)

EXTENSIONS & MODIFICATIONS

The “What’s the Skinny on Soil” activity is ideal to conduct with the Water MSP-water infiltrometer lab. Students can use the soil infiltrometers to learn how water moves through the soil in the plots.

ACTIVITIES OF THE SESSION

Procedure:

1. Sieve soil through a 2mm screen.

2. Select a straight-sided bottle and fill approximately 1/3 full of sieved soil

3. Add water until the bottle is 3/4 full. Cap the bottle, and shake bottle vigorously for **10 minutes** to mix everything thoroughly. Check to be sure **NO** soil is clinging to the bottom of the bottle.

4. 1-2 minutes after you stop shaking the bottle, set it on the desk and measure the height of sediments settled at the bottom (**A**). Wait **2 hours** and take a second measurement (B). Wait **2 or 3 or weeks** to take a third measurement (c).

   Record your group’s data in the chart on this worksheet, as well as the data from the other groups.

Data Sheet
Name: _____

Layer D: organic materials

Layer C: Clay

Layer B: Silt

Layer A: Sand

Write the thickness of each layer in the chart below. Don't forget the units!

Soil location: _____

	Thickness(mm)	**Percentage (%)**
Layer A: Sand		
Layer B: Silt		
Layer C: Clay		
Total		

Field and Lab Worksheet

1. Where is your soil field collection site? _____
2. What are some characteristics of your site? Observe surrounding land use, vegetation types, proximity to water, etc.

3. Describe your observations. What size particles settle first? What do you think make up the components of each layer?

4. What types of sediments float? Which ones settle to the bottom?

5. Record your group's data in the chart on the back of this worksheet, as well as the data from the other groups.
6.

7. What kind of soil does your plots contain? Is it mostly Sand? Clay? Silt?

8. Explain how sand, clay and silt hold water

Clay:_____
_____
Sand:_____
_____
Silt_____
_____

9. Based on these results, which site do you think will experience the highest plant productivity? Write your hypothesis and state how you arrived at it.

10. Which soil type had the highest plant productivity? Did this align with your expectations?