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

**Soil location:** __________

<table>
<thead>
<tr>
<th>Layer</th>
<th>Thickness(mm)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer A: Sand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layer B: Silt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layer C: Clay</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
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</tbody>
</table>
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. 


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?