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# Quick & Easy Habitat Education Activities Soil Assessment I- Composition

Adapted from numerous sources by Heidi Bohan/ Starflower Foundation

**Fifth Grade**  
**45-60 Minutes**  
Indoor/Outdoors

5-7

<p><b>Description:</b> Students conduct tests to assess soil composition from their study plots and from different plant community types in the habitat area. They compare data and draw conclusions about their results. To reinforce the learning experience and to share equipment and data, consider working with other classes who are studying the ‘Soils’ science kit.</p>	<p><b>Vocabulary</b>  <b>Soil composition:</b> <i>the general makeup of a soil, including different size inorganic materials (e.g., sand, silt, clay) and humus (decomposed organic matter) in varying proportions</i>  <b>Soil texture:</b> <i>the visual and tactile characteristics of soil</i></p>
<p><b>Objectives:</b></p> <ul style="list-style-type: none"> <li>• Students understand that simple observational tests can help determine soil types.</li> <li>• Students understand that soil composition may vary within a habitat area.</li> </ul>	<p><b>Washington State EALRs</b>  <b>Science 1.1</b> Identify, describe, and sort materials using physical properties such as hardness, shape, state of matter, smell, temperature, texture, weight, and magnetic properties. <b>2.1.3</b> Understand how to construct a reasonable explanation using evidence. Generate a scientific explanation or conclusion including data from an investigation and an explanation of how the data supports the explanation or conclusion. <b>3.2.3</b> Understand how knowledge and skills of science, mathematics, and technology are used in common occupations.</p> <p style="text-align: center;"><b>Science Kit: Land &amp; Water</b></p>
<p><b>Print Materials:</b></p> <ul style="list-style-type: none"> <li>• ‘How-to-do Activity: Soil Composition Tests’</li> <li>• Master: ‘Soil Assessment’ form, ‘Soil Composition Test Instructions’</li> </ul> <p><b>Kit Materials:</b></p> <ul style="list-style-type: none"> <li>• Tools and equipment for assessments: 1 set per plot team (see ‘How-to-do Activity’)</li> </ul> <p><b>Teacher Supplied:</b></p> <ul style="list-style-type: none"> <li>• Copies: ‘Soil Test Instructions’; ‘Soil Assessment’ form: 1 per plot team</li> <li>• Water bottle (quart), trowel or other small digging tool: 1 per plot team</li> <li>• Clipboards: 1 per plot team</li> <li>• Labels/masking tape/ indelible markers to label containers</li> </ul> <p>Note: Retain the completed ‘Soil Test Assessment’ form from this activity for use in ‘Soils Assessment II – Hydrology’.</p>	

<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Bring students to habitat area. Review results from <i>Plant Assessments</i> activity. Ask, “What determines which plants will grow in a certain area?” Point out different plant communities in your habitat area. Solicit ideas about what might account for the differences, for example, “Why does an upland forest grow there, shrub-scrub there, and an emergent wetland there?” (Differences in aspect, water, <b>soil</b>). Once soil is mentioned, say, “Yes. Soil plays an important role.”</li> <li>• Review what students know about soil. Students should know the following, from studies in earlier grades: <ul style="list-style-type: none"> <li>○ Soil is composed of sand, clay, silt, and humus; soil comes from rock breaking down, and plant and animal waste; water passes through soil in varying degrees; soil provides support, nutrients, and water for plants; microbes such as invertebrates and fungi live in soil and break down matter into humus.</li> </ul> </li> <li>• “How is this information important in the formation of plant communities?” (Different soil type and composition is preferred by different plants for moisture, nutrients and support.)</li> <li>• “Today we are going to conduct some tests that will help us to assess the soil composition in our plots, and in different areas in our habitat area. These are similar to tests you may have conducted during the <i>Soils Science Kit</i>.” Discuss what students may remember. Pass out ‘Soil Composition Test Instructions’ and ‘Soil Assessment Form’ to plot teams.</li> <li>• Use demonstration plot, and refer to ‘Soil Composition Test Instructions’, to demonstrate how to collect samples and test for: <ul style="list-style-type: none"> <li>○ Soil texture: Soil texture reveals the composition of the soil (percent of clay, sand, silt, humus): Collect 2 teaspoons of soil from 6” below surface; make a ball; make a ribbon. Analyze the soil type and enter information in the ‘Soil Assessment’ form.</li> <li>○ Parts of the soil: Collect enough soil to fill collecting container half full (at least one cup), add water to cover and shake. Label container with the plot number or name.</li> </ul> </li> <li>• Have students go to their plots and conduct soil tests. Remind them to record information on their soil assessment form.</li> <li>• Gather students together. Ask each student team to select an area with a plant community that is different from their plot (monitor choices to reflect as much variety as possible). Repeat tests at these sites and label containers with the site name.</li> <li>• Return to the classroom. Tell students that tiny particles (clay) will remain near the top of water while larger ones (sand) will settle towards the bottom. Silt settles in between. Humus often remains on top or attaches to particles.</li> <li>• Let soil layers settle in jars until water is clear (overnight or longer). Measure and evaluate percentage of sand, silt, and clay (see ‘Soil Composition Test Instructions’). Enter information in the ‘Soil Assessment’ form. Compare results with ‘soil texture test’ assessments. Are they the same? If not, how would you explain that?</li> <li>• Compare soil samples from plots to the soil from another site. If they are different, ask students to predict which one will hold more water.</li> </ul>
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