
Name That Soil



Purpose: This lesson serves as an introduction to soil properties and composition.

Objectives:

Students will:

- Identify the two main components of soil (inorganic and organic material) by making observations about each soil sample.
- Explain ways in which soil differs from one place to another and why these differences are important by participating in a large group discussion.
- Explain how certain factors (climate, living things, time, or geologic factors) affect the soil where the samples came from by participating in a large group discussion.

Time Required: 90 minutes

Appropriate grades: 4th-6th

NGSS and Common Core Standards:

5-ESS2-1: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

CCSS.ELA-LITERACY.SL.4-6.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade appropriate topics and texts, building on others' ideas and expressing their own clearly.

Materials:

- 6 different soil samples in Ziploc bags
- 6 hand lenses
- 6 sheets of plain white paper (not provided)
- 6 pencils (not provided)
- Butcher paper or whiteboard for compiling data (not provided)
- Paper plates or containers to spread soil samples in for viewing (not provided)

Activity:

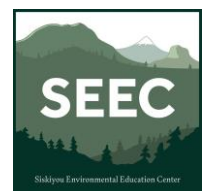
Introduction	1. Ask students what they think soil is made of. Have them think about this, share their ideas with a neighbor, and then share ideas with the whole class. Record their answers on the board for everyone to see.
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<p>Body</p>	<p>Part 1: 45 minutes</p> <ol style="list-style-type: none"> 2. Set out 6 stations consisting of one soil sample bag, one hand lens, and one sheet of paper on different tables or work stations. Divide the class into 6 groups. Each group needs a piece of paper and writing implement. Have students set up their data sheet by dividing the paper into six sections and numbering one through six. 3. Explain the activity before students move to their station. The group will have four or five minutes to work with their soil sample. (Do not tell them at this time that each sample is different.) The objective for this part of the activity is for all of the group members to interact with the soil, the materials, and each other for the entire 4-5 minutes. They should record as much as possible on their paper that their group observed, discussed, or wondered about their soil. 4. At the end of three or four minutes, have each group share with the class the things they recorded. These things will include some combination of: observations about the texture, smell, or appearance of the soil; guesses of where it came from or what is in it; questions about the soil or the activity itself, etc. Write the contributions of all groups on the board. Have the class help to group similar thoughts/questions/observations together. By this time, the students should have figured out that each soil sample is different and resulted in some different and some similar observations and questions. 5. Explain that, in a moment, each group will have the opportunity to spend a couple of minutes investigating each of the other soil samples. Decide as a group on four or five different questions/observations that each group should focus on as they investigate each sample. At each sample, they should record the sample number and their responses to the questions. They will have 2 minutes per sample, and will not revisit the one they already worked with. In addition, they may record anything else that particularly interested them or seemed important about any of the samples. <p>Part 2: Analysis and discussion (30 minutes)</p> <ol style="list-style-type: none"> 6. Students should bring their last soil sample with them and sit with their group in a central area near the board. Write the numbers 1-6 across the whiteboard, creating vertical columns in which to record data. Have a student from each group come up and record the group's observations for each sample. Tell them to write their observations even if another student has already written the same thing. 7. When all groups have added their data to the board, have the class
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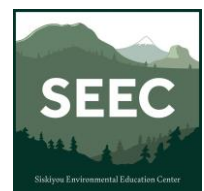
	<p>identify observations that are the same or similar within each sample. Erase duplicates and add a star next to one of the observations for each similar observation made by another group.</p> <p>8. What things do all of these soils have in common?</p> <p>9. Discuss how each soil has some inorganic material (rocks particles) and some organic material (things that are or once were alive: leaves, organisms, twigs, etc.). Organic and inorganic materials make up most of the soil and provide nutrients for plants, allow soil to hold water and air, and provide a habitat for soil-dwelling animals. The type and amount of inorganic and organic materials can differ greatly between soils from different areas. This is one reason that soils in different areas may support different plants and animals. What are the major differences in the soil samples we looked at?</p> <p>10. Where do you think each of these soil samples came from? If this wasn't one of the original questions, have students take a minute to individually write down a guess of where they think each sample came from. Then give them a few minutes to discuss their guesses in their small groups, and then share their thoughts with the whole class. Reveal to them the actual sources of the samples once they have guessed and discussed. (#1-Compost pile, #2-Beach, Oregon Coast, #3-Garden bed, #4-Forest Floor, Oregon Coast, #5-On a steep slope in Lithia Park, #6-On a trail in Lithia Park)</p>
<p>Closure</p>	<p>11. Review the main ideas of the lesson in a large group discussion: (10 minutes)</p> <ul style="list-style-type: none"> • What is soil made of? <ul style="list-style-type: none"> ○ Why are these materials important in soil? • What are some differences that might be found between soils? <ul style="list-style-type: none"> ○ How might these differences be important? • What specific factors affect the soil in the particular locations where our soil samples came from? (Climate, living things, time, or geologic factors.) <ul style="list-style-type: none"> ○ How do you think those factors make a difference?

Modifications:

- **Lower Elementary:**
 - Design pre-made data sheets and/or have students draw each soil sample instead of writing observations.



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- **Upper Middle School:**
 - Have students collect their own soil samples and compare them with the samples in the kit.
- **High School:**
 - Take students out on a field trip (or out to the schoolyard) and conduct soil testing and collect samples from the field to analyze.

