



Playing in the Dirt

This lesson introduces students to different types of soils and helps the student to characterize the soil in terms of texture. Students learn that different soils support different life.

HYPOTHESIS:

Several different types of soils exist. Different types of soils support different types of plant growth.

Primary Learning Outcome:

Students will learn to distinguish between differing soil types, observe the different plant species associated with each, and will be able to identify the components of a soil profile.

- *How does the soil type influence the kind of plants found there?*
- *What attributes would be ascribed to healthy, fertile soil?*
- *How does the organic matter under a log or other object differ from that just underneath the leaf litter?*

Assessed GPS:

SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

- a. Exhibit the above traits in their own scientific activities.
- b. Recognize that different explanations often can be given for the same evidence.
- c. Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.

SCSh3. Students will identify and investigate problems scientifically.

- a. Suggest reasonable hypotheses for identified problems.
- c. Collect, organize and record appropriate data.
- d. Graphically compare and analyze data points and/or summary statistics.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

- a. Develop and use systematic procedures for recording and organizing information.
- b. Use technology to produce tables and graphs.

SCSh6. Students will communicate scientific investigations and information clearly.

- a. Write clear, coherent laboratory reports related to scientific investigations.
- b. Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.
- c. Use data as evidence to support scientific arguments and claims in written or oral presentations.
- d. Participate in group discussions of scientific investigation and current scientific issues.

Total Duration:

- **1 hour lecture** (definitions of organic matter, O, A, B, C, and R horizons, discussion of soil profiles, discussion of different types of soils)
- **1 hour outdoor lab** (walking to and observing three or more different areas)
- **30 minutes** (group discussion)

Materials and Equipment:

- Rulers

Procedures:**Step One**

Observe and record data regarding soil types in three different outdoor areas.

Step Two

Once all areas have been visited, divide students into groups and assign each group an area to report. Each group then describes their observations to the rest of the class. Discussion should include differences in soil types as well as the nature of the plant life found there.

Assessment:

Students should take extensive field notes to be kept in a laboratory notebook. Students can be quizzed or tested over the vocabulary and background material.

Students can be quizzed or tested over the lecture and lab material. Extensive field notes should be taken and kept in a separate notebook, which can be graded. Students should also be tested on the lecture material.

Lesson Materials to be Attached:

- Laboratory handout/guide for notebook

Extension:

Students can bring soil into the classroom to be mixed with water and soap. Once the mixture settles, students can compute the percent of sand, silt, and clay in the sample. See “The Science Behind Our Food” lesson in a trunk, “The Dirt on Dirt.”

Soils Lab

Please leave each area as undisturbed as possible!

Name: _____

Location 1: _____

1. Please list three characteristics of the plant life abundant here.

2. Please describe three attributes of the leaf litter on the ground.

3. Measure to the nearest half-inch the depth of the organic layer by placing the ruler in the ground until it can no longer be inserted easily. PLEASE DO NOT BREAK THE RULER.

4. Carefully remove an area of the organic matter until the soil is visible.
 - a. Describe the color of the soil, with a minimum of 2 characteristics

 - b. Describe the texture of the soil (yes, you must touch the soil).

5. Find a limb or small log and roll it over WITHOUT disturbing the soil. List two differences in the organic matter as compared with question #2 above.

Soils Lab

Location 2: _____

1. Please list three characteristics of the plant life abundant here.

2. Please describe three attributes of the leaf litter on the ground.

3. Measure to the nearest half-inch the depth of the organic layer by placing the ruler in the ground until it can no longer be inserted easily. PLEASE DO NOT BREAK THE RULER.

4. Carefully remove an area of the organic matter until the soil is visible.
 - a. Describe the color of the soil, with a minimum of 2 characteristics

 - b. Describe the texture of the soil (yes, you must touch the soil).

5. Find a limb or small log and roll it over WITHOUT disturbing the soil. List two differences in the organic matter as compared with question #2 above.

Soils Lab

Location 3: _____

1. Please list three characteristics of the plant life abundant here.

2. Please describe three attributes of the leaf litter on the ground.

3. Measure to the nearest half-inch the depth of the organic layer by placing the ruler in the ground until it can no longer be inserted easily. **PLEASE DO NOT BREAK THE RULER.**

4. Carefully remove an area of the organic matter until the soil is visible.
 - a. Describe the color of the soil, with a minimum of 2 characteristics

 - b. Describe the texture of the soil (yes, you must touch the soil).

5. Find a limb or small log and roll it over **WITHOUT** disturbing the soil. List two differences in the organic matter as compared with question #2 above.