

The Dirt on Soil

Objectives: Students will learn about the types and textures of soil within a soil profile.

Materials:

Soil profile pictures with description (mounted with Velcro)

Soil profile poster board

Soil Word Scramble Handout

Pencils

Various soil samples of sand, silt, and clay

10 to 15 minutes; Soil discussions

Ask students what they think soil is and how soil is important in our lives.

Explain that soil is not just dirt; it is what we grow our food in, where many different animals and microbes live, and is the basic building block of the earth.

Explain what a soil profile is (The horizontal layers [horizons] in the soil from the surface to the bedrock. Each layer has a unique history) and how each layer is unique and can tell us many important things about a certain area.

A horizon can tell us:

- The soil's parent material.
- The topography of the area.
- The organisms that are in the soil.
- The land use of the soil (agriculture, wetland, etc.)
- If organic matter is present.
- What land forming processes have acted upon the soil (erosion, compaction, deposition, etc.)

15 to 20 minutes; Make a Soil Profile Diagram

Students will place pictures of different soils found in a soil profile in their correct location on the soil profile diagram, using Velcro and poster board. Each picture should be labeled with a description of the soil type. Discuss each soil type.

10 to 15 minutes; Soil Word Scramble Handout (found below)

20 to 25 minutes; Texture by Touch

Each type of soil has a different texture. Soils, called “Loams,” can consist of a mixture of any two or all three of the textural classes. Sand has the largest particle size, silt has a slightly smaller particle size, and clay is the smallest particle size of soil there is.

Soil texture can be determined by feel. This is done by moistening the soil and rubbing between your fingers. Also, when wet, clay tends to stick together to form a ball whereas sand does not. Using known soil texture samples, ask students to feel each type of soil. Using unknown samples, students can then feel to determine the type of soil it is.



Ground level: Plants grow and animals live here. A thick cover of plants can keep the soil cool and keep it from drying out. Decomposers recycle dead plants and animals into humus.

Topsoil: Plants grow and animals live on top of the soil. This is sometimes called the organic layer. A thick cover of plants can keep the soil cool and keep it from drying out. Decomposers recycle dead plants and animals into humus.

Subsoil: This is a mix of mineral particles and some humus near the top. Subsoil is very low in organic matter compared to the topsoil. This is the layer where most of the soil's nutrients are found. Deep plant roots come here looking for water. Clays and minerals released up above often stick here as water drains down.

Weathered parent material: This horizon can be very deep. There's no organic matter here at all. We're out of reach of all living and dead organisms down here. It's all rock particles, full of minerals.

The entire soil profile used to look like this all the way to the surface. Physical weathering broke the parent material up into small pieces. Don't be fooled! This layer may contain rock particles that are different from the bedrock below. A river or a glacier might have brought it from somewhere else.

Bedrock: We finally found solid rock! The bedrock formed before the soil above it. It will wait here until erosion or an earthquake exposes it to the surface. Then some of it will be weathered to become the next batch of parent material. The soil-making process will start all over again.

SoiL WoRd ScRaMbLe!

1. POSTLIO _ _ _ _ _
2. UHSMU _ _ _ _ _
3. ORHNOZI _ _ _ _ _
4. BUOSLI _ _ _ _ _
5. CORBDKE _ _ _ _ _
6. NSAD _ _ _ _ _
7. NERMILA _ _ _ _ _
8. CYAL _ _ _ _ _
9. ISOL _ _ _ _ _
10. TLSI _ _ _ _ _
11. RSINEOO _ _ _ _ _
12. CPCMTIAONO _ _ _ _ _
13. POSDOEINTI _ _ _ _ _
14. LAMO _ _ _ _ _
15. XTEURTE _ _ _ _ _

Answers

1. TOPSOIL
2. HUMUS
3. HORIZON
4. SUBSOIL
5. BEDROCK
6. SAND
7. MINERAL
8. CLAY
9. SOIL
10. SILT
11. EROSION
12. COMPACTION
13. DEPOSITION
14. LOAM
15. TEXTURE