

Soil Profiling

Overview

Students will learn about learn about soil profiling and how to identify different layers of soil.

Background

- What is **soil**?
 - Soil is a natural body comprised of solids (minerals and organic matter), liquids, gases, occupies space, and is characterized by one or both of the following: horizons, or layers, that are distinguishable from the initial material as a result of additions, losses, transfers, and transformations of energy and matter or the ability to support rooted plants in a natural environment.
 - When people think of soil, most only think of the top layer, or topsoil. But the underlying soil and bedrock are just as important.
- What is a **soil profile**?
 - The soil profile is defined as a vertical section of the soil that is exposed by a soil pit or soil sample. A **soil pit** is a hole that is dug from the surface of the soil to the underlying bedrock.
- What is a **soil horizon**?
 - Looking at a soil profile, you may see layers of varying soil particles; each of those layers are called soil horizons.
- What are the names of the different soil horizons?
 - Most soils have three major horizons -- the surface horizon (A), subsoil (B), and the substratum (C). Some soils have an organic horizon (O) on the surface, but this horizon can also be buried. The master horizon, E, is used for subsurface horizons that have a significant loss of minerals (eluviation). Hard bedrock, which is not soil, uses the letter R.
- What makes soil horizons different from each other?
 - Soil horizons differ in properties such as color, texture, structure, and depth. Other ways that horizons differ is by chemical and mineral content, but these are not as easily seen and require further testing.

Directions

Have students look at the provided soil profiles and answer the questions on the following sheet

Soil Profiling Worksheet (Potential) Answers

1. **What differences do you see amongst the soil horizons?**

a. **Color**

-the deeper the soil horizon the lighter the color/the topsoil is darker than lower horizons

-some horizons have a red tint

b. **Particle size**

-the lower the soil horizon the larger the particles

- note the pore size (the space between particles) gets bigger the farther down you go

c. **Depth**

-lower horizons are deeper (bigger)

-O horizon is the shallowest (there is not as much there as other horizons)

2. **Why do you think those differences occur?**

-the more organic matter that is present the darker the soil is; thus the layers close to the surface where living things are the darker it is.

-The red color could be the presence of minerals

-bedrock is typically light in color

3. **What would happen if you stripped off horizons A & O?**

-removing those layers would expose soil that does not have an abundance of organic matter, thus it would be difficult for plants to grow in this type of soil.

4. **Why do you think understanding soil profiles is important to soil health?**

-looking at soil profiles can help us understand what type of soils are present at a given location and can help determine the productivity of the soil. For example, if you see a profile with a large O horizon you know that it will be fertile and that the opposite is true.

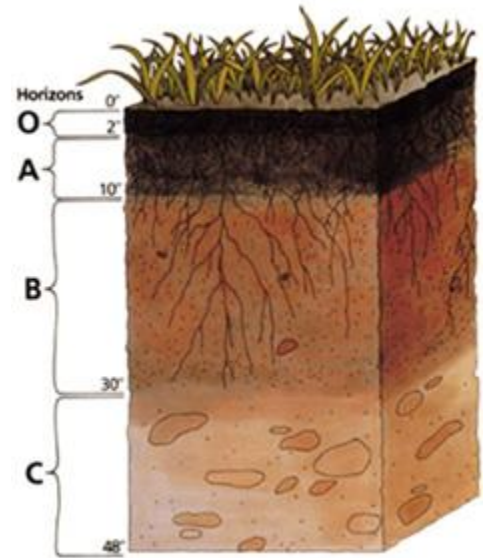
Soil Profiling Worksheet

1. What differences do you see amongst the soil horizons?

a. Color-

b. Particle size-

c. Depth-



2. Why do you think those differences occur?

3. What would happen if you stripped off horizons A & O?

4. Why do you think understanding soil profiles is important to soil health?