

BEFORE 2: What IS Soil?

Background for teachers: <https://web.extension.illinois.edu/soil/concepts/concepts.pdf> provides a good overview of soil concepts.

Standards addressed: Science (2018) 3.1, 3.6, 3.8

Instructional Strategy:

1. Ask students to bring in soil samples from their houses. (You can also collect soil from a couple different locations and bring them to class if students are unable to bring soil in. Can reuse milk or yogurt containers to bring soil to school.)
2. Cover tables with paper or plastic tablecloths.
3. Instruct students to pour out their soil and carefully and closely examine the soil using hand lenses, table magnifiers, and /or microscopes.
4. Students record their soil observations by writing, drawing, and/or labeling.
5. **First**, have students investigate soil visually. Invite students to look at the soil and find the following things:
 - a. The largest piece of soil they can see
 - b. The smallest piece of soil they can see
 - c. Any materials they recognize
 - d. Different colors they see
6. **Second**, have students investigate soil by smell. Students will often have the assumption that soil smells “bad”. In reality, soil should smell rich. Give students a second chance to smell the soil to react to their senses rather than their expectations. Invite students to scoop up a handful of soil with both hands and ask them how the soil smells:
 - a. Does the soil smell sour? Rich? Good? Alive?Encourage students to use adjectives and descriptive language to explain why they describe the soil as smelling in a specific way.
7. **Third**, have students investigate soil by feel. Have students take a pinch of soil and rub it between their fingers.
 - a. Is the soil smooth? Rough? Gritty? All of the above?
8. **Finally**, have students investigate soil structure. Invite students to grab a handful of soil and pack it into a ball in their hands. Hold the ball in an open palm and see if it stays together.
 - a. Does it break when you tap on the top of the ball of soil?
 - b. Is the soil blocky? Is it loose? Does it stay fluffy or does it compact easily?

NOTE: The soil must be slightly moist for this investigation to work. If the soil is too dry, the soil particles will simply fall through students’ hands.

9. As a class, share observations. As students share, introduce vocabulary such as those defined below. These terms will be used at Blandy when discussing soils and soil layers.



- **Organic matter:** anything that came from a recently living organism (dead leaves, insect wings, etc.) (Another definition is materials of biological origin that are capable of being decayed.)
- **Inorganic matter:** minerals (non-living) substance such as sand or rocks.
- **Topsoil, subsoil, and bedrock:** the three basic layers of soil
- **Humus:** dark organic matter that forms as soil microorganisms decompose the plant and animal matter.
- **Erosion:** movement, from one place to another, of pieces of rock or portions of the soil by wind, water, or ice.
- **Soil conservation and renewal:** naturally occurring and human efforts to preserve soil resources
- **Review** with students that soil is composed of air, water, minerals, and organic matter and that soil structure depends on the percentage of each of these components.

