



PLAY-DOH CORE SAMPLING

Grade Level

4-6

Length of Lesson

1 class period

Objective

By the end of this lesson, students will have a better understanding of the different layers of the soil and the impact that human activity can have on these layers.

Materials Needed

- Small disposable aluminum loaf pans
- Four colors of Play-Doh
- Large plastic straws
- Colored pencils (same colors as Play-Doh)
- Student handouts
- *Optional:* AITC Soil Ag Mag

Standards

NGSS

4-ESS1-1, 4-ESS2-1, 4-ESS2-2, 5-LS2-1, 5-ESS3-1, MS-LS2-4, MS-ESS3-3

Lesson Summary

This lesson is a fun, interactive way to teach students about the different layers of the soil profile and introduce important concepts related to soil conservation, particularly erosion.

Suggested Sequence of Events:

1. Set Up: Fill the disposable loaf pans with four layers of play doh. Try to create varying depths of the layers throughout the pans so that each layer is not the same size throughout. Students should be able to see that the layers of the soil are different depths at different locations.
2. Complete the activity following the procedures:
 - Have students read the [AITC Soil Ag Mag](#) to increase background knowledge and interest in soils.
 - Divide students into groups of three to four students.
 - Give each group a pan of Play-Doh “soil,” a straw, colored pencils, and the student handouts.
 - Explain to students that they will be taking core samples of their “soil” to determine the soil horizon/soil profile.
 - Students will push the straws into the play doh and remove a sample. They will then document these samples on their worksheet to get a better idea of the soil profile on their “property.”
 - After completing their samples, students will attempt to draw the soil profile based on the data they compiled from their soil samples.
 - Finally, students will use their research to answer some questions related to the soil on their property.
4. Whole class discussion and reflection of activity.



Science

PLAY-DOH CORE SAMPLING

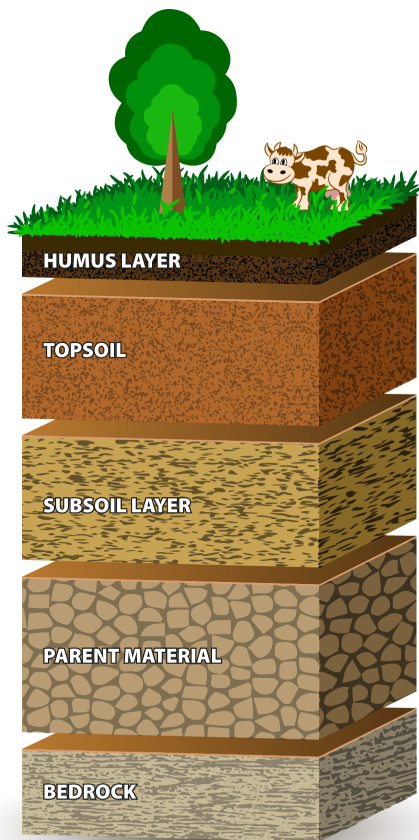
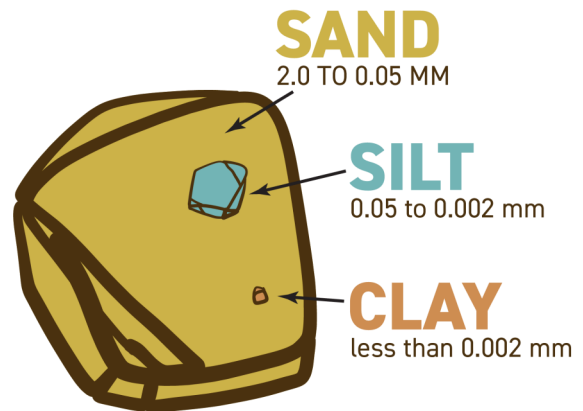
INTRODUCTION TO SOILS

You might think that all soil is the same, but that is just not true! Soil is a complex and amazing substance that we depend on for our very existence. Let's learn a little bit about the soil under our feet.

Soil Particles

Soil is made up of organic matter (once living plant and animal matter, mineral particles (sand, silt, and clay), and pore spaces (open areas potentially filled with air, water, and living organisms).

The percentage of the sand, silt, and clay particles in a soil determines the soil's texture. To the human eye, these particles all seem small, but they are actually very different in size. If you imagine that a sand particle is the size of a basketball, then a silt particle would be the size of a golf ball, and a clay particle would be the size of a dot made by a piece of chalk!



Soil Layers

Soil is also divided into layers. The depth of each of these layers is important when considering what different areas of land can be used for. Most agriculture production takes place on the top 12 inches or so of soil. Farmers and ranchers must work hard to maintain the health of the topsoil so their lands will continue to produce food for the world to eat! Let's learn more about the soil layers.

Humus layer: Top layer of decomposing matter, such as leaves. This layer can be thick in some soils, thin in others, or even not present at all.

Topsoil: This layer is made up of mineral particles (sand, silt, and clay) along with organic matter. This layer is extremely important for agriculture.

Subsoil: This layer is rich in minerals that have moved down from the layers above it, but it is much more compact than the topsoil.

Parent Material: This layer is made up of deposits at the surface of the Earth which the layers above it have been made from over time.

Bedrock: This is a layer of rock, such as granite, basalt, quartzite, limestone or sandstone



Science

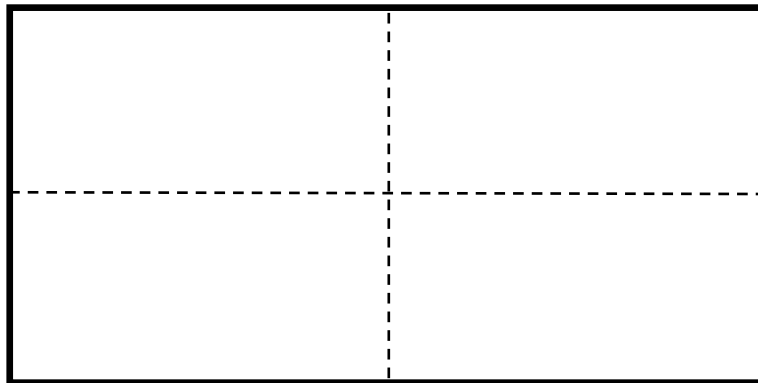
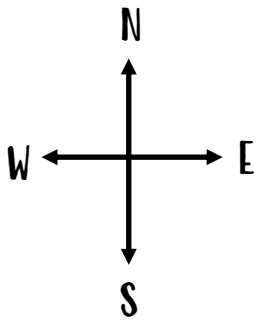
PLAY-DOH CORE SAMPLING

STUDENT WORKSHEET

Directions

1. Using your colored pencils, fill out the legend to show which colors represent the various soil layers.
2. Pick a location on your 'land' and push one straw straight down into the Play-Doh. Carefully pull the straw out.
3. On the map below, mark the location you collected your sample from.
4. Each time you collect a sample, color in the layers in the data boxes. Make sure to record the directional location for each sample by using the compass by the map.

MAP OF LAND



LEGEND	
<input type="checkbox"/>	Humus/Topsoil
<input type="checkbox"/>	Subsoil
<input type="checkbox"/>	Parent Material
<input type="checkbox"/>	Bedrock

SAMPLE 1	
<input type="checkbox"/>	Location:
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

SAMPLE 2	
<input type="checkbox"/>	Location:
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

SAMPLE 3	
<input type="checkbox"/>	Location:
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

SAMPLE 4	
<input type="checkbox"/>	Location:
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

SAMPLE 5	
<input type="checkbox"/>	Location:
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

SAMPLE 6	
<input type="checkbox"/>	Location:
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

SAMPLE 7	
<input type="checkbox"/>	Location:
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

SAMPLE 8	
<input type="checkbox"/>	Location:
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	



Science

PLAY-DOH CORE SAMPLING

STUDENT WORKSHEET

Now that you have collected all of your data, it's time to analyze your samples and create your soil profile! Use your data to draw/color the soil on your property in the diagram below as best you can.



Use your data and soil profile to answer the following questions:

1. If you were to add a vegetable garden on your land/property, what location would be the best place for it and why?
2. What could be the cause for your land to have hills?
3. What could be the cause for your land to have different types of soil and depths of soil layers in different areas?
4. Why do you think it's important for farmers to know their soil? In what ways can farmers help care for the soil on their land?

TEACHER RESOURCES

Background Information:

For the purposes of this lesson, we only have four layers of Play-Doh soil. We recommend having students assume that the humus and topsoil layer are one color together, and then the three remaining colors are the remaining soil layers. This simplifies the lesson, and also reduces the number of colors of Play-Doh required for each student group.

Though not necessary, it may be helpful for students to understand the meanings of these key terms:

- Bedrock
- Clay
- Compost
- Leaching
- Organic matter
- Parent material
- Sand
- Silt
- Soil horizon
- Subsoil
- Topsoil

Extension Ideas:

- The NRCS publication “Lines on the Land” is an excellent resource to introduce students to many of the conservation practices that farmers employ on their fields to protect their soil. The resource can be accessed here: https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_006156.pdf
- Soils4Teachers is a great source for everything soil-related: <https://www.soils4teachers.org/>
- Learn more about Illinois State Soil, Drummer Soil with this student-friendly handout: <https://www.soils4teachers.org/files/s4t/k12outreach/il-state-soil-booklet.pdf>
- Go to agintheclassroom.org to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!