Upper Grades:

- Have students research different topics on soil and give an oral report with a visual demonstration of some form. Display board, diorama or tools used by a soil scientist.
- Presentation topic ideas; soil erosion, non-point source sediment pollution, or have them come up with their own topic:
- Searching for Soil on the web:

  www.dnr.state.oh.us/soilandwater

  www.osu.edu/

  www.oh.nrcs.usda.gov/

Pre/Post visit activities are adapted from the National Association for Interpretation Interpretive Booklets and may need to be adjusted depending on the grade level.

## Ohio Academic Content Standards reinforced or introduced by this program:

Third Grade
- Earth and Space Science: 3, 4, 5, 6
- Life Sciences: 6
- Scientific Inquiry: 2, 4, 10

Fourth Grade
- Earth and Space Sciences: 8, 9, 10
- Life Sciences: 5
- Physical Science: 3

Fifth Grade
- Earth and Space Science: 5, 6
- Life Sciences: 1, 2, 3,4

Sixth Grade
- Earth and Space Science: 1
- Science and Technology: 2

## Evaluation Form

Please fill out the evaluation form and return it to Geauga SWCD. We appreciate your comments and suggestions. If you enjoyed the program and would like to see future programs offered please write a letter to the Geauga County Commissioners and thank them for funding the Geauga SWCD. Thank you for inviting us to your classroom and we look forward to coming back!

**This brochure was created by the Staff of the Geauga Soil and Water Conservation District under the authority of the Board of Supervisors and assistance from the USDA-Natural Resources Conservation Service.**

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***Geauga SWCD Mission:***
***"To conserve, protect, and enhance the resources of Geauga County by providing leadership, education, and assistance to all."***

**Geauga Soil and Water Conservation District**
14269 Claridon-Troy Rd.
PO Box 410
Burton, Ohio 44021
440-834-1122
Fax: 440-834-0316
gswcd@geaugaswcd.com
website: http://



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**Geauga Soil and Water Conservation District**

# Soil Sleuths Teacher Guide Kindergarten-6th Grade

Students will discover the properties of soils through demonstrations, experiments, and activities. This program offers a hands-on learning experience for all!

**Become a Soil Scientist!**

# The Dirt on Soil

***What is Soil?***

Soil is a living resource that supports plant life. It is made up of different size mineral particles (sand, silt, and clay), organic matter, and pore spaces, which are potential living spaces filled with air, water, or living organisms. Soil has biological, chemical, and physical properties that are always changing.

***Sand, Silt, and Clay***

The three mineral components of soil are sand, silt, and clay. These minerals help determine the soils structure, behavior, texture, and even its name. Sand is the largest particle and it has more pore space between its particles than silt or clay. Silt particles are smaller than sand, but larger than clay particles. Likewise, there is less pore space between silt particles than between sand particles, but more than between clay particles. Clay, the smallest particle, has the least amount of pore space.

***So what do they do?***

All clusters of soil particles have the ability to attract and hold water. Water moves quickly through a sandy soil because of the large pores, or empty spaces between the particles. A clay-type soil, however, will actually attract water and absorb it like a sponge. Clay particles, as a clump, swell as they get wet and shrink as they dry. These particles have the ability to pull and hold onto water with 2,500 pounds of force!

The porosity of the soil– the available pore space of a soil type– determines how quickly water will move through the soil. Some of the water is held by the soil particles. Gravity pulls the rest of the water, called free water, downward. The water held by soil particles helps plants grow.

# Pre-Visit Activities- Portable Soil Profile!

Instructions:

- Place one layer of rocks on the bottom of a beaker or clear plastic container.
- Add a layer of light colored subsoil over the rocks and fill the beaker about 2/3 full.
- Place a 1 inch layer of light colored topsoil over the sub soil.
- Spread organic matter over the topsoil.
- Label the layers using a marker on the beaker.
- Extension: add worms to some of the beakers watch as they mix up the soil, discuss the benefits of worms in the world of soil.
- Lower grade adaptation: Use different colors of Play Doh in clear plastic cups to identify the different layers. After completion cut a straw in half and insert into the container to show the different layers.

**MY SOIL SAMPLE:**

- Have students bring in a soil sample from their yards in clear plastic bags for further discussion at time of visit.

# Post Visit Activities- Habitat Profile and Report

Lower Grades:

- Use three different grades of sandpaper to represent the three components of soil. Course (sand), medium (silt) and fine (clay).
- Have students create a habitat profile. Using the different sandpaper pieces have them design the type of soil found in their habitat. Have them explain why?