

Activity name: Let's Talk Dirt!

This activity is meant to provide a real-world application of the ATEEC Recommended Core Curriculum's math, science, technical, communications, or critical thinking knowledge and skill concepts, which have been identified by the ATEEC Fellows as necessary preparation for environmental technology occupations.

Appropriate for which course(s)? Introduction to Environmental Technology, Sampling and Monitoring

Approximate time to complete activity: 1 hr.

Source of idea or activity (for published source, please include author, title, publisher, date): Sharon Flanagan

Materials/resources needed (equipment, print media, electronic media, videos, supplies, etc.): Trowels, shovels or augers

Ternary diagram of soil composition, from the USDA Soil Conservation Service Soil Classification System

Glass jars for sample and water, with lid

Metric rulers

"Welcome to the Wetlands" soil color chart (optional - need citation) or Geotechnical Gauge, available from W.F. McCollough, 3101 Elkridge Ct., Beltsville, MD 20705, at approximately \$15. The Geotechnical Gauge is a marvelous soil classification tool.

Crayons (optional; goes with the "Welcome to the Wetlands" chart)

Gloves, safety glasses

Math, Science, Technical Communication Knowledge/skill concepts addressed:

Math -

- percentages of soils in sample by volume
- percentages from soils identification chart
- measurement of volume of sample

Science -

- classify soil components
- identify soil horizons

Technical -

- sampling
- chain of command

Communication -

- observation and communication of type of soil

Cognitive Level: Application and Analysis Levels

Scans Skills addressed: Manages material and facility resources. Acquires and evaluates information. Interprets and communications information.

Learning Objectives: The student will take a sample of soil, determine the percentage of the different types of soil particles it contains and identify the soil, using the Ternary Chart and/or the Color identification chart.

Primary Instructional Method: Hands-on sampling.

Instructional Events:

1. Each student should bring a small zip-loc bag of soil from their backyard and a glass jar with a lid. Soil samples should be taken from approximately from 2, 4, 6, 8, or 12 inches under the surface, this measurement should be recorded.
2. In the classroom, use gloves and goggles when transferring soil, the student will place a measured amount of soil into the glass jar using a trowel and fill with at least double the amount of water. The volume of soil should be recorded.
3. After closing the lid the soil and water sample should be agitated vigorously for 30 to 60 seconds. The jar should be allowed to sit undisturbed for 20 minutes.
4. While waiting for the particles to settle, the leftover soil should be characterized by identifying the texture or moisture content and differences in color. Students in wetland areas should complete a Wetland Soil Classification found in the *The Wonders of Wetlands*. This is an optional activity.
5. Samples of soil from six to 12 inches under the surface should be compared with other from 2 to 4 inches under the surface.
6. Using the Ternary Chart for soil classification, the student should determine the percentage of the different soil particles which are found in their sample. Using a ruler, students can mark off the three distinct layers of soil particles. (Note some samples do not have all three types of soil particles. Soil particles are sands, the heaviest, silts and clay (the lightest).
7. Answer the following question: What percentage of the entire sample is made up of sand? of silt? of clay? When these are determined, use the Ternary Chart to name the type of soil the sample represents. Read the Chart by marking the percentage of the soil particle indicated on each side of the triangle, follow each percentage to a point of intersection on the chart which indicates the kind of soil.
8. Students should construct a chart of soils in the class samples, noting differences in moisture, particles, color and soil type.

9. Discuss the different kinds of soils which were found in the samples taken by the class. Locate on a map where these samples were taken. Predict what their water samples will look like after one day of settling, after one week, after one month of sampling.
10. Students should discuss the importance of soil, conservation of soil, handling of contaminated soil and the use of soil.
11. Alternative Activity: Combine all of the individual class soil samples into one bucket. Using this combined sample which has been mixed, take representative samples. Analyze these samples according to moisture, texture, color and percentage of particles as done previously. Chart this representative sample and compare to the individual samples.

(Note: missing image)

Activity submitted by: Sharon Flanagan

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