



Soil: The Wealth Beneath Your Feet

SUBJECT AREA: Science – Earth Science, Environmental Science

GRADE LEVEL: Ninth through twelfth.

DURATION: 30 to 90 minutes, depending on student needs; staff will require 30 minutes to set up demonstration.

AUDIENCE SIZE: 30 students at one time; larger groups can rotate through stations if participating in shorter program.

OVERVIEW: In this lesson, students step into the shoes of environmental scientists! They will have the opportunity to get their hands dirty studying the characteristics of the different soil types. The purpose of this investigation is to provide a firsthand look at how soil scientists utilize field methods and lab analysis techniques to identify soil types. Students will compare various scientific methods to draw conclusions regarding soils samples. They will also study the characteristics of major soil types and test the properties of soil field samples.



OBJECTIVES:

The student will:

- Utilize a soil texture triangle to identify different soil types.
- Utilize field verification techniques to identify different soil types.
- Compare and contrast field verification and lab analysis techniques to identify different soil types.
- Take part in the scientific method to draw conclusions regarding soil samples.
- Relate the geosphere (soil characteristics) to the biosphere (plants and ecosystems as a whole).

DIFFERENTIATION:

This program is differentiated into various levels/activities. Below is a description of each section. Department staff can mix and match this program to cater to the needs of students.

PART A: Use field verification methods and lab analysis to determine textures of various soil samples. Compare and contrast scientific methodology when drawing conclusions.

PART B: Relate soil characteristics to the soil texture determined in Part A.

PART C: Conduct additional field methodologies to determine organic content of soil. Relate organic content percentage to plants and ecosystems categorization.



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SUNSHINE STATE STANDARDS:

SS.912.G.5.1 - Analyze case studies of how the Earth's physical system affect humans.

SS.912.G.5.2 - Analyze case studies of how changes in the physical environment of a place can increase or diminish its capacity to support human activity.

SC.912.L.17.7 - Characterize the biotic and abiotic components that define freshwater systems, marine systems and terrestrial systems.

SC.912.N.1.3 - Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.

SC.912.N.1.1 - Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science.

ADVANCED PLACEMENT COURSE CURRICULUM:

Topic 1.2 - Terrestrial Biomes - Describe the global distribution and principal environmental aspects of terrestrial biomes.

Topic 4.2 - Soil Formation and Erosion - Describe the characteristics and formation of soil.

Science Practice 4 - Analyze research studies that test environmental principles.

Science Practice 5 - Analyze and interpret quantitative data represented in charts, tables, and graphs.