



Classroom Teacher Preparation

Earth Science 14: Soil Properties

Please use the following to prepare for the next SfS lesson.

Description:

This lesson introduces students to the characteristics and formation of soil. In order to answer the question of which soil is best for a tomato plant, students examine the color, texture, and field capacity (a measure of how much water soil can hold and make available to plants) of different soils.

Lesson Objectives – SWBAT (“Students Will Be Able To...”):

3rd-5th

- Describe soil color and texture and explain what these properties can tell us about soil
- Measure relative field capacity of a soil
- Interpret results from different tests to determine how suitable their soil is for plants

Disciplinary Core Idea (DCI)

ESS2 Earth’s Systems – ESS2.A Earth Materials and Systems

- (3rd-5th) Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, living organisms, and gravity break rock, soils, and sediments into smaller particles and move them around

Science & Engineering Practice (SEP)

Planning and Carrying Out Investigations

- (3rd-5th) Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution

Crosscutting Concept (CCC)

Structure and Function

- (3rd-5th) Different materials have different substructures, which can sometimes be observed

Preparation:

This is an introductory lesson to soil formation and soil properties. No special preparation is needed.

Room Set Up for Activities:

Students will work in up to 6 small groups (4-5 students each) and will need a table or group of desks pushed together for a workspace. Access to a sink will be needed for cleaning up and resetting materials between classes.

Safety:

There are no safety concerns with this lesson.



Related Modules:

This lesson may be taught as part of a sequence or group of related modules on **Earth Science**, particularly Geology. Other modules in this sequence include:

Earth Science 2: Introduction to Tectonics - This lesson is an introduction to basic plate tectonics. It includes a review of the earth's internal structure and the formation of continents, oceans, and mountain ranges as a result of plate movement

Earth Science 10: Fossils - This module briefly explores the various time periods known to humans and provides students the opportunity to excavate fossils from rock and reconstruct and analyze a fossilized skeleton for clues to the type of creature that existed during the late Jurassic period.

Earth Science 13: Soil Nutrient Cycles and Soil Chemistry – Students follow a multistep process to perform tests of the concentrations of the soil nutrients nitrogen, phosphorus, and potassium (NPK) and/or a test of soil pH.

For other module sequences and groups, look here: www.sciencefromscientists.org/sequences

Standards Covered:

Please click the following link to our website to review the standards covered by this lesson, listed by state: www.sciencefromscientists.org/standards/

Lessons are matched to both national NGSS and local state standards.

After Our Visit:

Our Classroom Post can be found on our website at sciencefromscientists.org/cohorts. Use the name of your school/cohort and password to log in.

To help Evaluate, check out our Open Response questions online at sciencefromscientists.org/open-response-questions. They are freely available for all of our lessons for current teachers. Use the password supplied by your instructor to log in.

For a Lesson Extension, we recommend students conduct an experiment in which they test and compare the ability of different soil samples to filter and purify liquids. Check it out [here](#)

Additional Resources:

- The Smithsonian Institution has a number of excellent resources on their website: <http://forces.si.edu/soils/index.html>
- The Soil Science Society of America has an extensive website, with activities aimed at children: <http://www.soils4kids.org/about>
- A soil science professor maintains an educational website for students in grades 4-8: <http://www.doctordirt.org/home>