

Mississippi Soils

Summary

Students will learn about the basic properties of soil, including the three major components of soil types. Students will also learn about the types of soil in the state of Mississippi and the role soil plays in the development of the region. Students will participate in a hands-on experiment to observe the soil properties and will report their findings on a worksheet.

Learning Objectives

Students will:

Understand the basic properties of soil

Learn the state soil of Mississippi and other types of soil found in the state

Participate in a hands-on experiment and record their findings

Teaching Approach

Hands on Experiment

Teaching Methods

Discovery Learning

Cooperative Learning

Hands-On Learning

Visual Instruction

Direct Instruction

Assessment Type

Worksheet Assessment

Lesson Plan

What is soil?

Whats the difference between soil and dirt? Dirt is what you find under your fingernails. Soil is what you find under your feet. Think of soil as a thin living skin that covers the land. It goes down into the ground just a short way. Even the most fertile topsoil is only a foot or so deep. Soil is more than rock particles. It includes all the living things and the materials they make or change.

If we break a soil down into its components we will find different sized mineral particles, organic matter (things that once were alive), some things that are currently alive, and some air and water.

The different size mineral particles will break out into three distinct classes: The biggest ones are called sand. You can pick most sand particles out with the naked eye. Sand is made out of small rock fragments and does not hold water very well. Medium sized particles are called silt. Silt is made from microsand particles and is silky or smooth to the touch. Silt holds more water than sand does. The smallest particles are called clay. Note that clay particles have diameters ranging from 25 times less than the smallest sand or largest silt to 1000 times less than the largest sand particles. Clay has a large surface - a spoonful of clay could have the surface area of a football field.

Where have we seen these types of particles before? The sand in soil is the same type of sand that we see on the beach or on playgrounds. Clay is a material that we can make pottery out of and is the base of plates, bowls and cups that we drink out of. When we see sand and clay in nature they are in a pure form and are not mixed with any other soil components.

Why is soil important?

There are many functions of soil. Some are obvious to gardeners, others are not. Soil provides a physical matrix, chemical environment, and biological setting for water, nutrient, air, and heat exchange for organisms living totally within the soil, as well as the roots and tubers of plants.

Another function soil performs is the regulation of biological activity and molecular shifts between solid, liquid, and gaseous phases. This affects the cycling of nutrients in the soil and plant growth. Physical functions of soil include serving as a filter to protect environmental quality, and as support for buildings.

What kinds of soil are in Mississippi?

Mississippi has a wide variety of soils reflecting the diversity of parent materials, climate, biological factors, and topography in the state. Three general land resource regions are identified: 1) river flood plain (the Delta); 2) a loess region (a band of soils formed in windblown material that adjoins the Delta; and 3) Coastal Plain (the rest of the state).

As human land management transitioned pre-Columbian to the modern, including forest clearing and more recently forest replanting, the soils within a region led to the current predominant surface activities. For example, most Mississippi row crop production (cotton, corn, and soybeans) occurs in the relatively flat, deep alluvial soils of the Delta that are conducive to mechanized farming. Conversely, animal production and forestry are predominant in the shallower soils of the hills in east and south Mississippi.

The types of soil in Mississippi are diverse, comprising seven of the known 12 soil orders in the United States. That is because of the climate differences that occur from the cooler north to the warmer south. Mississippi also has a range of materials and topography that helps create the variety of soil types. The age of the soil types range in the young Holocene of the Delta region to the very old Cretaceous-period soils farther north.

For more information and additional lessons:

Soil Education | National Resources Conservation Service <http://soils.usda.gov/education/>

Introduction to Soils | Mississippi State Extension Services <http://msucares.com/crops/soils/master.html>
USDA

Types of Soil in Mississippi | Garden Guides <http://www.gardenguides.com/99162-types-soil-mississippi.html#ixzz1Ecs4PiOW>

Frameworks and Competencies Covered in this Lesson

Science

1. Explain and use skills necessary to conduct scientific inquiry.
- e. Interpret and describe patterns of data using drawings, diagrams, charts, tables, graphs, and maps. (DOK 2)
- f. Explain why scientists and engineers often work in teams with different individuals doing different things that contribute to the results. (DOK 2)

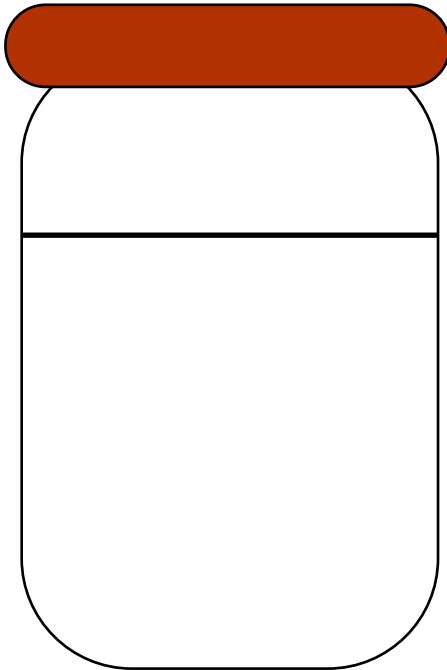
Social Science

5. Integrate, connect, and apply social studies into other subject areas and everyday life. (G, H, C)
- d. Identify regional soil types in Mississippi and investigate their effects on local agriculture.

Soil Composition Experiment

Name: _____ Date: _____

Part One Directions: Shake the jar of soil and water until it is well mixed. Let the soil settle for 40-60 seconds. After it has settled, work with a partner to estimate the amounts of sand, silt and clay in the soil jar. Fill in the percentages on the lines.



What Percent of the soil is:

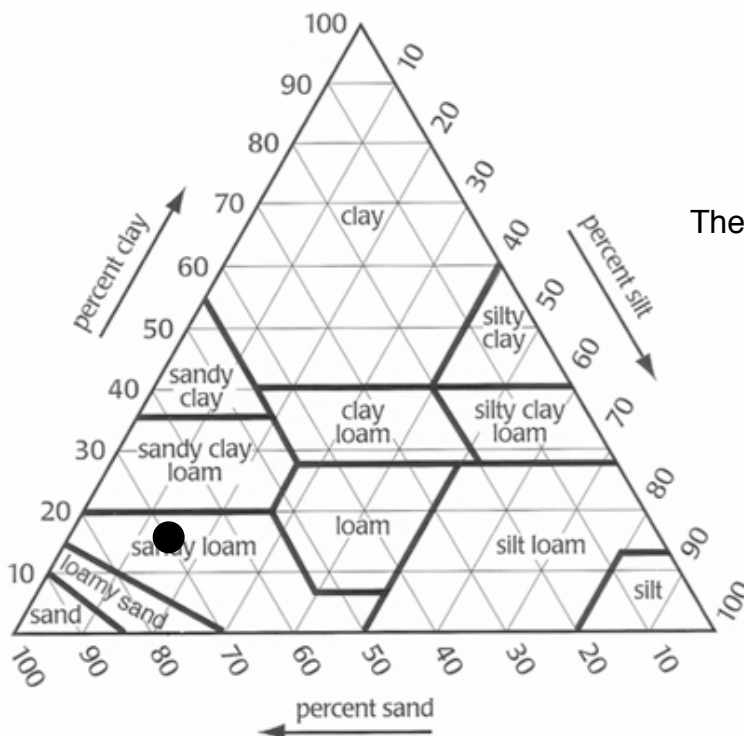
Sand _____ 15 _____

Silt _____ 67 _____

Clay _____ 18 _____

Part Two Directions: Using the percentages of silt, sand and clay from Part One, indicate on the Textural Triangle where the soil would be. Based on the the chart, determine what kind of soil is being used in our experiment.

Textural Triangle



The soil is _____ sandy loam _____.

Soil Facts and Definitions Worksheet

Name: _____ Date: _____

Directions: Fill in the blanks to complete the facts and definitions about soil using the word bank provided below. Each word will only be used once.

smallest	largest	particles	rocks	Natchez
football field	sand	silt	clay	silky
smooth	easily	gritty	water	dirt

1. Soil is not dirt.
2. Mississippi's state soil is Natchez.
3. Soil is made up of three different types of mineral particles called sand, silt, and clay.
4. Sand is the largest type of mineral, made from fragments of rocks.
5. Sand usually a gritty texture and can be easily seen.
6. Silt is a medium sized soil element, made from microsand particles.
7. Silt is silky or smooth to the touch and holds more water than sand does.
8. Clay is made of the smallest type of mineral particles.
9. A spoonful of clay could have the surface area of an entire football field.