

NHMU: How Are Soils Classified?

Summary

Students will learn to list the three texture groups in which soils are classified. They will also learn to classify a soil sample as sandy, silty, or clay soil.

Group Size

Pairs

Materials

Sandy soil

Silty soil

Clay soil

(These soil samples can be prepared using base soils obtained from a local greenhouse or garden shop)

Water

Magnifying glass

Background for Teachers

Soils are composed of mixtures of mineral and organic materials, but are classified according to the size of their mineral particles. The three main texture groups are sandy, silty, and clay.

Sandy soil contains particles that can be seen with the naked eye and feels gritty when rubbed between the thumb and forefinger. Sandy soils will generally not stick together when wet.

Silty soil contains particles, which are smaller than sand particles but larger than clay particles. Silt feels powdery when rubbed between the thumb and forefinger. Silty soil sticks together when wet, but will not hold its shape after it is dry.

Clay soil contains the smallest particle size. Clay particles form a sticky soil when wet and will generally hold a shape after drying. Soils are rarely composed of just sand, silt, or clay. They are usually a mixture of the three with a larger percentage of one size of particles.

Instructional Procedures

Have the students work in pairs.

Obtain a sample of sandy soil, silty soil, and clay soil.

Break and rub each soil sample between your thumb and forefinger. Describe how each soil feels. How does each sample feel different?

Look at each soil sample under a magnifying glass. Which soil sample has the largest particles?

Add water to each soil sample until it sticks together and you can make a ball. Then try to roll each sample into a cigar shape. Can this test be used to classify sandy, silty, and clay soils? How?

If the sample will roll into a cigar shape, let the "cigar" dry overnight. After the sample dries, does it still hold its shape?

Extensions

Obtain soil samples from various locations around the schoolyard and have the students classify them as sandy, silty, or clay soils.

Have the students plant beans in each of the different soil types and compare the growth rates of the plants.

Bibliography

Sund, R. Tillery, Trowbridge, B.; *Elementary Science Discovery Lessons: The Earth Sciences*; 1973
This lesson plan was provided by the [Utah Museum of Natural History](#).

Authors

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