



ANALYZING SOIL COMPOSITION FOR PLANT HEALTH

Shake, Raffle & Roll

1. Explain to the class that soil is made of three different types of particles: sand, silt and clay. The perfect soil will contain an even mixture of all three. This is called a loam soil.

2. Give each student a small sample of sugar, representing sandy soil. This soil does not usually grow plants well, as it dries out quickly and does not let the roots get enough water. Have the students describe the texture. Next, allow students to feel a small sample of dry flour and rub it between their fingers. This is the powdery, silky texture of silt. Finally, add a small amount of water to the flour. This is the texture of clay. Clay particles clump together and compact when dry and drain poorly when wet. Have the students describe the texture.

3. Determine the type of soil in the garden by filling a large jar half-full with soil. Fill the remaining space with water. Have the students take turns vigorously shaking the jar until the larger clumps are broken apart. Let the jar sit for two minutes. Use a permanent marker to draw a line to mark each layer. Allow at least 24 hours for the soil to settle completely. The top layer will be clay, which includes the smallest, lightest particles. The middle layer will be silt, and the heaviest particles fall to the bottom, sand. Have the students identify the thickest layer to determine the soil type.

4. Have students measure and graph the separate layers in centimeters. Divide the class into groups to duplicate the activity with soil from different areas of the campus. Students can record, graph and compare their findings. Ask the students how this activity might influence where they plant a garden.



Materials:

- Flour
- Sugar
- Water
- Large glass jar with lid
- Soil
- Water
- Permanent marker
- Ruler

Vocabulary:

Clay: fine granular material composed of closely packed particles.

Loam: ideal garden soil that has a well-balanced mixture of sand, silt and clay.

Sand: coarse granular material composed of finely divided rock and mineral particles.

Silt: sedimentary material composed of fine mineral particles in size between sand and clay.

Objective:

Students will investigate soil texture and properties, determining the type of soil found in the garden.

California State Board of Education Content Standards

Grade 1: Science: 2b, 2c, 4b, 4c
Math: Measurement and geometry 1.1, 2.4;
Statistics, data analysis and probability 1.0

Grade 2: Science: 1a, 1b, 2c, 3c, 3e, 4b, 4c, 4e
Math: Measurement and geometry 1.1, 1.3;
Statistics, data analysis and probability 1.4

Grade 3: Science: 3d, 5a, 5c, 5e
Math: Measurement and geometry 1.1

This lesson can be easily adapted to meet the educational standards for a variety of grade levels.

This lesson has been adapted from Junior Master Gardener® Program curriculum by California Foundation for Agriculture in the Classroom. For additional educational resources, visit www.jmgkids.us.