

WHICH TYPE OF SOIL WOULD YOU USE?

USING OUR MATH SKILLS TO FIGURE IT OUT



Overview & Purpose

Students will use their knowledge of soil to conduct an experiment which will require mathematical skills. They will subtract to figure out how much water (mL) will be retained from different types of soils. The soil has to hold just the right amount of water to successfully grow trees. This data will help the students

to discover which land in Spain would be best to plant olive trees, which is a successful commodity used to make olive oil.

Background Information

Andalusia, Spain is known for the production of olive trees, which produce olive oil. Olive oil has been an essential part of the Spanish diet for centuries. The ancient Phoenicians planted the first olive trees in Spain 3,000 years ago. It is important to know which soil can best be used to successfully grow these trees.

Education Standards

Math

1.3(F) generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20

2.4(D)* generate and solve problem situations for a given mathematical number sentence involving addition and subtraction of whole numbers within 1,000

Materials Needed

- Safety glasses or goggles
- Pebbles
- Sand
- Clay soil
- Loam mixture -sand, silt, clay, and humus
- 3- 1litter empty bottles
- Tape
- Razor knife (to be used only by the teacher)
- 3 large coffee filters
- Ruler with inches
- Timer
- Graduated cylinder (that holds 50mL for 2nd grade/20mL for 1st grade)

Vocabulary

Same as Lesson 2- Types of Soil Vocabulary

Student Objectives

1. Students will test 3 different samples to determine which soil hold the most water
2. Students will use their mathematical skills to subtract amounts of water
3. Students will decide which soil would be the best to hold the “right” amount of water for planting olive trees.
4. Identify where Andalucia is located on a map to determine where olive trees are most found in Spain.

Activity

Prior to the lesson, set up the lab samples using the Water Retention in Soil Lab Sheet.

This will be a teacher demonstration, however, encourage the students to participate as helpers, as they follow along using their lab sheets. Keep the silt and hummus to the side for the conclusion discussion.

1. Recall the information from Lesson 2. Ask students to share which soil had the largest particles and which had the smallest particles. Explain to students that they will be completing a lab to find out which soil retains the most water. Explain that in Spain, olive trees cannot receive too much water or too little. Their challenge today is to find out which soil is best for olive trees.
2. The teacher will follow the lab sheet directions and will pour 50mL (for 2nd grade) or 20mL (for 1st grade) in each sample. Students will record each amount that was drained and will subtract it from the beginning amount.
3. The teacher may have to assist students with their computations. Students may have to regroup to subtract. The teacher may provide graph paper or extra paper for computations.

4. After the amounts are solved. Encourage students to discuss their findings. In conclusion, the pebbles and sand will drain the most water and the clay will hold the most. Discuss that the clay will harden over time and will not provide air, whereas the sand and pebbles will let too much water out. Show the students the silt and humus and explain that having a mixture of soils to balance this out will be better for the olive trees. Mix sand, silt, clay and soil and show students that this is called loam. Tell students that loam is found in Andalusia, Spain. Show students the jpg of the maps. End with making the connection that this is why olive trees grow the best in this part of Spain.

