

LOOKING AT SOIL IN 4TH GRADE

GOAL: Students learn what soil is by examining soil and doing a small planting experiment with lettuce.

OBJECTIVES: This lesson is focused toward students in fourth grade or higher. They will go out into the garden to take a look at the organic and inorganic matter in the soil. They will then plant lettuce seeds in different soil mediums and see which ones germinate the best.

STANDARDS: Science Grade 4 Standard 3 Objective 3a and 3c

MATERIALS:

- Sand
- Compost
- Clear Plastic Cups
- Measuring Cup(s)
- Lettuce Seeds
- Worksheet/clipboard/pencil

PROCEDURE: Before heading out to the garden, talk with the students about the difference between living and non-living things that might be in the soil (organic matter vs inorganic matter). Once the students have a clear idea about the types of things they are looking for in the soil, grab a clipboard with the worksheet and head out to the garden.

Out in the garden, have the students spend about five minutes filling out the top section of the worksheet (looking closely at the soil).

After that, gather the class together in the center of the garden and talk about the air and water components in soil. Put one cup of garden soil into a clear plastic cup. Have one cup of water in a clear measuring cup. Pour the water into the cup slowly just until it barely starts to pool at the top of the soil. As a class, discuss the questions on the worksheet.

Fill three more cups with 1. Sand 2. Compost and 3. Sand and compost mixture. Sprinkle lettuce seeds on top and cover lightly with soil. Have the students make a hypothesis next to the "Week 1:" heading on the worksheet. Which cup will germinate the best? Take the cups back into the classroom and place them in a sunny spot to observe over the next few weeks.

Head back into the classroom to complete the math and graphing sections of the worksheet.

ASSESSMENT TOOLS:

- Worksheet
- Participation

SOURCES:

Lesson adapted from UEN Lesson *TRB 4:3 - Investigation 5 - What is in Soil?*

Name: _____

WHAT IS IN SOIL?

Take a look at the soil from the garden, and take a moment to write down what is in the soil. Look for: mineral matter (small pieces of rocks and minerals) and organic matter (leaves, sticks, worms, insects, etc.)

Make a list under each heading of what you found:

Living and Once Living Matter

Non Living Matter

SOIL PIE

Watch what happens when we add some water to the soil.

Did you notice air bubbles rising from the soil? Explain why that would happen:

How much water is left in the measuring cup?

How much water did we added to the soil?

Where did the air go when we added the water?

We often see lots of worms on the top of the soil after a big rainstorm.

Explain why:

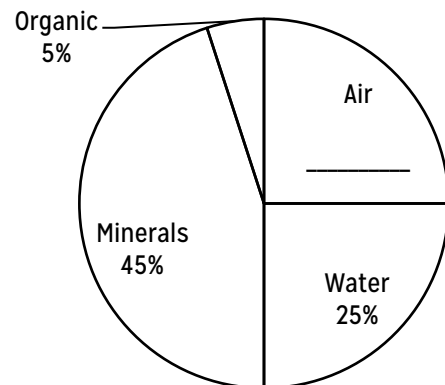
SOIL PIE

The pie graph shows everything that is in the average soil.

The number should equal 100%.

What percentage of the soil is air? _____

SOIL PIE



SOIL PIE

What percentage of the soil is air and water?

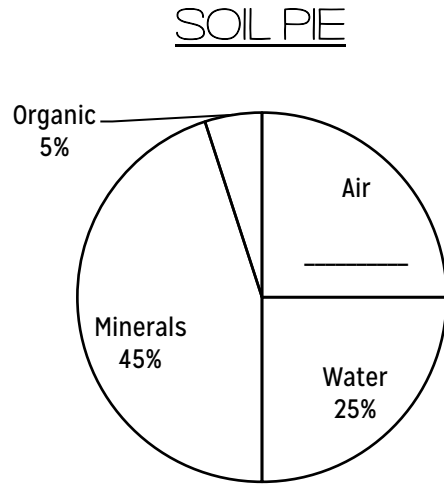
Which component of soil is the smallest percentage?

Which component of soil is the largest percentage?

Where does mineral matter in the soil come from?

Where does organic matter in the soil come from?

Convert the information from the pie graph into a bar graph below:



Minerals					
Water					
Air					
Organic Matter					
	0%	25%	50%	75%	100%

AIR, WATER, NUTRIENTS AND PLANT GROWTH

Plants need water and nutrients from the soil to survive. Plants take in water and mineral nutrients from their roots through their stems. It is similar to drinking liquid from a straw. When plants take in water from the ground, they are also getting some of the nutrients they need from the soil. Only a small part of the plants' nutrients come from the soil, a plant gets most of the nutrients it needs from the air. Using the space below, observe what happens in the coming weeks to the three different cups of soil and seeds.

Week 1 Hypothesis:

Soil

Soil and Compost

Compost

Week 2 Hypothesis:

Soil

Soil and Compost

Compost