Introduction to Soil

Exploration of Agriscience – 02.07 Describe the major components of soil.

**Background**

Soil is a vital substance to life on earth. It is more than just “dirt”; soil is the complex mixture of minerals, water, air, organic matter, and countless organisms that are the decaying remains of once-living things.

**Directions**

Watch the short clip on soil texture at the following link then answer the questions below.

Soil Texture – Environmental Science <https://www.youtube.com/watch?v=knrmCbctGEA&safety_mode=true&persist_safety_mode=1>

Soil Questions

1. What are the 3 components that makes up soil?
2. What is porosity?
3. What is permeability?
4. Does water flow through clay or sand soil more easily? Explain why.
5. What is the soil that is best for growing most crops called?
6. What is the proportion of clay, silt, and sand, respectively, in loam soil?

Soil Lab

I challenge you to find at least 2 different soils at your home. Some places to look – the natural soil in your yard, bags of soil in a shed or garage, home gardens, plant pots, sand boxes, etc. Complete the steps below and take pictures of your lab.

1. First, read through the entire lab sheet.
2. Collect the following supplies:
* 2 small containers
* 2 sheets of white paper (write soil A and soil B on the sheets)
* A small cup of water
* A notebook and pencil
1. Without disturbing any plants, take small samples of 2 **different** soils and put them in separate containers, determine one as soil A and one as soil B.
2. On a flat table, or a sidewalk or driveway, carefully pour each dry soil sample onto it’s own sheet of paper.
3. Observe each sample. Feel it in your fingers, move it around the paper. Observe the contents, particle sizes, color, texture, etc.
4. Take note of your observations in your notebook.
5. Now, pour the soil samples back into their own containers.
6. One soil sample at a time, complete the tests below. Take notes on your observations/findings.
7. Use the grid on the last page and see if you can figure out what kind of soils you collected!
8. Report your observations, pictures, and conclusions in any way you choose (word doc, PowerPoint, video, Prezi, pamphlet, etc.)

Stage One - The Ball Test

Take a handful of soil and wet it little by little until it is kind of like moist putty. Adjust this by adding either dry soil or water. Form the soil into a ball.



Some soil will not form into a ball. You can adjust the moisture back and forth forever and it still is not a ball. This means you have **Sandy soil**.

For those that did get a ball, move on to Stage two.

Stage Two - The Ribbon Test

For this test take the ball of soil and gently push it into a ribbon between your thumb and forefinger. Here is a picture of me doing that.



If, as you try to form a ribbon, the soil just kind of crumbles you have **Loamy Sand**.

If the soil does form a ribbon you just keep pushing the soil out until the ribbon breaks from its own weight.
    •    Weak Ribbon - an inch or less before breaking
    •    Medium Ribbon - between 1 and 2 inches long before breaking
    •    Strong Ribbon - longer than 2 inches

The ribbon makers move on to Stage three.

Stage Three - Gritty, Smooth or Sticky

In this stage you take a small amount of the soil from your sample and put it in the palm of your hand.  Add quite a bit of water and then using your finger rub the soil against your palm.



What you are looking for is whether the soil feels
    •    Mostly Gritty - like there are bits of sand
    •    Very Smooth - like you are touching flour
    •    Neither gritty nor smooth predominates - might feel sticky



Resources

<https://www.youtube.com/watch?v=knrmCbctGEA&safety_mode=true&persist_safety_mode=1>

<https://www.the-compost-gardener.com/soil-texture-testing.html>