

Soil Testing Lab

BACKGROUND

After water, soil is the most important resource on the earth. Every living organism relies either directly or indirectly on soil. However, less than 12% of the earth's surface is suitable for farming and soil takes hundreds of years to form. Therefore, it is necessary for us to conserve the earth's soils.

One way that soil is conserved is through testing. Geologists test soils from around the globe to identify any chemicals in the soil that may cause an unsuitable farming environment and to detect environmental sources that are polluting soil.

In this lab activity, you will become a geologist and test the soil for three different chemicals.

MATERIALS

Trowel	Small container for soil
Wax paper	Large test tube
3 small test tubes	chemical tablets
Distilled water	graduated cylinder
Pipette	

PROCEDURES

Part One – Obtaining the Soil.

1. Obtain a trowel and small container for soil.
2. Go to the appointed area on campus to dig up soil.
3. Fill your container with soil, but don't compact it.
4. Return to the lab.
5. Get a piece of wax paper that is about 12in long.
6. Spread your soil on the wax paper to dry. Pick out any leaves, stones or other debris.
Crush any lumps of soil.

Part Two – Preparing the Soil.

1. Read all instructions and put on safety goggles.
2. Fill a large test tube with 30mL of Water.
3. Add two Floc-Ex tablets to the large test tube. Cover and mix to dissolve
 - a. Be sure to use the proper tablets. There are different kinds of tablets.
4. Add one heaping teaspoon of your dried soil sample.
5. Cover and shake the tube to combine the soil and water.
6. Let the test tube rest until the soil settles to the bottom. The clear solution on the top will be used for the chemical testing.

Part Three – Chemical Testing

Nitrogen

1. Use pipette to transfer the 10mL of the clear soil solution into a test tube.
2. Add one Nitrate tablet to the test tube.

3. Cover and mix until tablet is dissolved.
4. Wait 5 min for the color to develop.
5. Compare the color of the solution the chart for Nitrogen. Record your observations. Note if there is a low (L), medium (M), or high (H) level of nitrogen.

Phosphorus

6. Use the pipette to transfer 25 drops of the clear soil solution to a test tube.
7. Fill the rest of the test tube (about 9 mL) with distilled water.
8. Add one Phosphorus tablet.
9. Cover and mix until the tablet is dissolved.
10. Wait 5 min for the color to develop.
11. Compare the color of the prepared solution to the chart for Phosphorus and record your observations. Note if there is a low (L), medium (M), or high (H) level of Phosphorus.

Potassium

12. Use the pipette to transfer 10 mL of the soil solution.
13. Add one Potassium tablet to the test tube.
14. Compare the cloudiness in the test tube to the chart for Potassium and record your observations. Note if there is a low (L), medium (M), or high (H) level of Phosphorus.
15. Clean up your station. Put all soil solutions into the designate buckets. Wash out the test tubes, but do not put any soil down the drains. Put all waste water in the buckets.
16. Be sure the counters are all clean. Wash your hands.

RESEARCH

Research the benefits of Nitrogen, Phosphorus and Potassium in soil. Include a few sentences about each in your lab report. <http://www.agr.state.nc.us/cyber/kidswrld/plant/nutrient.htm>

Name: _____

Lab Skills
Soil Testing Lab Questions

1. According to your observations, which nutrients was your soil sample lacking?
2. According to your research, why is it not surprising to see that some nutrients were missing from the soil?
3. If you were purchasing fertilizer for your soil sample, which nutrients would you be looking for in the fertilizer? Explain.
4. In the space below identify the benefits of each nutrient that you found from your research.