

SOIL INVESTIGATION LAB GUIDE

Sediment Test

This test will show the amount of each component in the soil.

1. Gather materials:
 - a. Sample of each soil
 - b. Ruler
 - c. Vials x3
 - d. Marker
 - e. Water
2. Fill the vial $\frac{1}{2}$ of the way full with dry soil.
3. Fill the remainder of the vial with water.
4. Place the cap on the vial. Ensure it is tightened securely.
5. Shake the vial vigorously to mix the soil and the water well.
6. Set the vial down on a flat surface.
7. Mark lines on the vial with the marker at the times below:
 - a. Mark after waiting 2 minutes. This is your **sand** layer.
 - b. Mark after waiting 1 hour. This is your **silt** layer.
 - c. Mark after 24 hours or once the water is clear. This is your **clay** layer.
 - i. You may also have some floating **organic material**.
8. In the table below, draw the vials for each test labeling the section of soil and approximate sizes. Record the layer sizes in centimeters.
9. Keep each sedimentation test for the chemical tests below.

Sediment Test			
Suspect 1	Suspect 2	Suspect 3	Crime Scene

Sediment Test			

Physical Test

- Gather materials:
 - Sample of each soil
 - Forceps
 - Petri dishes x3
 - Magnifying glass
- Remove the sample from the evidence bag and place in a petri dish.
- Use forceps and a magnifying glass to observe closely.
- Record what you observe in the table below.

Physical Test				
Sample	Suspect 1	Suspect 2	Suspect 3	Crime Scene
Color				
Odor				
Texture				
Presence of Plant Material				

Chemical Test: *pH, Nitrate, and Phosphate*

1. Add 3g of soil into a test tube with 2.5 mL of distilled water.
2. Place a stopper on the test tube and shake for 30 seconds.
3. Following the instructions on the package, add the pH tester strip.
4. Set the tester strip aside next to the pH comparison chart.
5. Add the nitrate tester strip to the liquid.
6. Set the tester strip aside next to the nitrate comparison chart.
7. Add the phosphate tester strip to the liquid.
8. Set the tester strip aside next to the phosphate comparison chart.
9. Let the strips rest for 5 minutes.
10. Use the comparison charts to determine the chemical composition of the soil.
11. Record your findings in the table below.

Chemical Test				
Sample	Suspect 1	Suspect 2	Suspect 3	Crime Scene
pH				
Nitrate				
Phosphate				

Reflection Questions:

1. Which test provided the most useful information for distinguishing between the soil samples? Explain.
2. What sources of error could affect the results of this investigation?
3. Why is it important to use multiple tests when comparing soil samples?
4. Did all tests point to the same suspect?
5. Is there enough evidence to make a confident match? Why or why not?
6. What are the strengths and weaknesses of soil evidence/trace evidence?