

Corn Science Investigation

Overview

Soil and forensic studies might have more in common than you think. Just as a detective would collect evidence to support what happened at a crime scene, agronomists, farmers, and many others collect evidence and soil samples to understand what might be taking place in a certain area. In this lab we will look at soil evidence in a particular area to create conclusions on what might have happened.

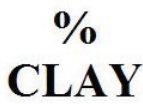
Here is the link to the Soil Jar Test video: <https://youtu.be/aKoAk2ar050>

Materials

- (3) different soil samples collected from different locations
- (1) soil sample from the crime scene
- (4) 400 mL beakers
- (1) 100 mL graduated cylinder
- (1) 20 mL graduated cylinder
- (1) digital scale
- (1) microscope or hand lens
- (1) glass stirring rod
- (1) small bottle of dish soap

Procedure

1. Receive four labeled soil samples. They should be labeled A, B, C and CS (crime scene).
2. Using a 20 mL graduated cylinder and digital scale, determine the density of each of the 4 samples and record your data for mass, volume, and density. Remember: $\text{mass/volume} = \text{density}$.
3. Place a small amount of soil under a microscope or hand lens. Take note of the soil's color and grain sizes. Record this data in the table below. Repeat the steps for the three additional soil samples.
4. Label 400 mL beakers with A, B, C and CS then add 300 mL of water to each beaker.
5. Place 100 mL of soil in each beaker, add two small drops of dish soap and use a stirring rod to mix for about 20-30 seconds. Do not mix aggressively or you may create soap bubbles in your sample.
6. Let soil settle for 15 minutes then estimate the % clay, % silt, % sand in each beaker based on the resulting layers. *Note the smaller particles in these containers will settle last.
7. Use the textural triangle to determine the soil name of each sample and record in table. If you have access to the internet, feel free to use the NRCS "Soil Texture Calculator" to help. <https://bit.ly/3jVTmur>
8. Using the data in the table, compare the three unknown soil samples (A, B, C) to the soil sample found at the crime scene (CS). Circle or highlight the evidence from your table that matches the crime scene sample.



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SILT**

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Conclusion Questions

1. What could cause the soil samples to have different densities?
2. What information does the shape of each soil grain provide?
3. Did you notice the color of the soil samples looking different under magnification? Why do you think that is?
4. List the layers in order as to which settled first in the beakers of water.
5. Which soil sample is most like the one collected from the crime scene?
6. Create a paragraph describing how the evidence you collected links one of the unknown soil samples to the crime scene.