

Super Sleuths General Overview

Goggles! Safety. It's important. Did I mention goggles? Wear goggles.

Time Management: The worst problem elementary competitors have. Divide and conquer where you can, combine when needed.

Tools: Well plates are great, but you have to wash the corners out. Spot plates are easier to clean but it is hard to see white powders in a white plate. Consider disposable Dixie cups or condiment cups if you have troubles (not paper!!). Toothpicks and popsicle sticks are great for scooping and mixing, Do not double dip. Cross contamination will give you false positives for your tests.

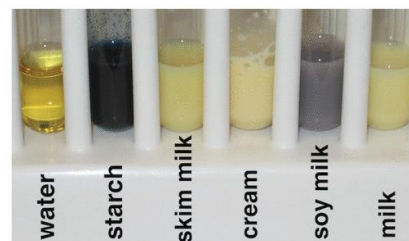
Testing Methods:

- Water Solubility- add about 10 mg of powder and 5 or 6 drops of water. If it dissolves, it's soluble. If not, then try with alcohol.
- Alcohol solubility – same process as with water.
- pH- use pH paper to determine if your powder (or soil) is an acid, base, or neutral. Test by dipping in powder/water solution from when you tested solubility. This does not work on insoluble powders.
- Iodine test- add a drop or two of iodine to the powder/water solution from when you tested solubility. Observe color change. Has to be Iodine potassium iodide solution, chemical stores sell it as 1% Iodine + 2% Potassium iodide in a solution. Buy at a health store or Amazon as Lugol's iodine solution (2% I + 4% KI, can cut by half with distilled water to get 1% + 2%)
- Vinegar test – vinegar is a mild solution of acetic acid, so it will react with bicarbonates (like baking soda- sodium bicarbonate) to form carbonic acid which decomposes into carbon dioxide "bubbles".

Powders: Use the powder analysis chart for identification. It's important to make your own using your own words. Start by filling in the known chart to see how things react, then make your own analysis chart. Why is this important?



Effervescence vs bubbles



Iodine test – color variations

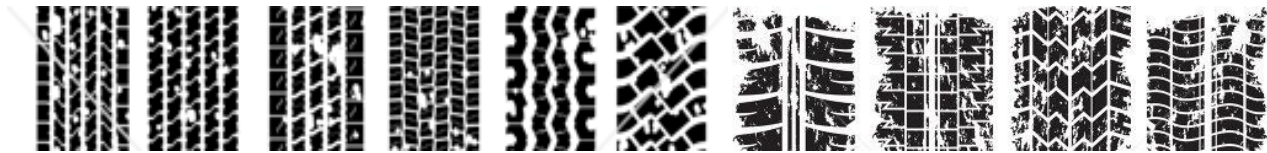
Soil: This is mostly matching from observable characteristics (color, odor, texture, composition), plus pH.



Shoeprints and Tire Tracks: This is strictly matching from observable characteristics. You may see a variety of things, know and be prepared to use the following terms to identify and differentiate between samples.

Fantastic website: <http://www.forensicsciencesimplified.org/fwtt/how.html>

TIRES: Tread, wear, irregularities, inflation level (over/under), positive/negative, impression, track/print, casting.



Positive	Negative (mirrored)
Actual tire	Tire track
Photo of tire	Photo of tire track
Casting of an impression	Actual impression in ground

SHOES: Tread, sole, heel/toe, length, width, wear, irregularities, positive/negative, impression, print, casting



Positive	Negative (mirrored)
Actual shoe	Shoeprint
A lifted shoeprint, on non-see through medium (adhesive paper)	A lifted shoeprint on see-through medium (clear tape)
Photo of shoe	Photo of shoeprint
Casting of an impression	Actual impression in ground

