Forensic Science Activity

Forensic Science is the use of science and technology to study and collect evidence that can be used in a court of law to help solve crimes. This activity explores some methods that may be used by a forensic scientist: chromatography, handwriting analysis, and DNA fingerprinting. The scenario for all these activities is that someone has stolen cookies out of a cookie jar.

Chromatography

↪ Goal: Teach kids how you can separate black marker pigments using paper chromatography (another example of a capillary force)

Materials -

- chromatography paper/coffee filter
- clear plastic cups
- clothes pins
- pencil
- water soluble black markers
- scissors
- thin wood rod/pencil

Procedure -

1. Acquire the materials (chromatography paper/coffee filters, clear plastic cups, clothes pins, pencils, water soluble black markers)
2. Take a clear plastic cup and set on firm surface
3. Cut the chromatography strip out of the coffee filter
4. Size the strip to fit the height of your plastic cup (make sure it does not hit the bottom)
5. Draw a straight line using a pencil to indicate your starting line about one inch from the bottom of your strip
6. Using the black soluble marker, place a medium sized line across the start line
7. Pour the solvent into the plastic cup (ie water or a combination of glass cleaner and white vinegar) - make sure your start line stays above your solvent!!
8. Using the clothes pin, clip the strip of chromatography paper together
9. Situate the pencil/thin wood rod in the clip so that the paper will stay inside the plastic cup without falling

10. Observe what occurs and write down your findings, get ready to share with the group

☆ Explanation: Each band created on your filter should represent how many compounds are in your substance. The color and distance each substance traveled can help you identify each compound. The more soluble a molecule is, the higher it will migrate up the paper.

Handwriting Analysis

↪ Goal: Using different handwriting samples, examine their similarities, differences, and abnormalities to help solve the crime.

Materials-

- Index cards or slips of paper for each writing sample
- A pen or marker to write with

Procedure-

1. Take an index card and write out the message in the handwriting of the person who committed the crime.
2. Use the other index cards and the same marker/pen to write the same exact message, but with different handwriting styles and sizes.[1]

☆ Explanation: Forensic scientists use handwriting analysis in tandem with other techniques to weed out suspects in hopes of catching the perpetrator.

[1] Whoever is trying to solve the crime using handwriting analysis won't know what the original was.

DNA Fingerprinting

↪ Goal: Using suspect profiles, examine the different types of fingerprints in order to catch the thief.

Materials-

- Use https://generated.photos/faces, another website, or actual pictures
- Paper
- Fingerprint images for each suspect

Procedure-

1. Identify what your partial fingerprint will look like.
2. Create your suspect profiles (name, age, description, alibi, notes, fingerprint image)
3. Identify your main suspect's fingerprint and compare it to the partial fingerprint found at the scene to solve the crime[2]

☆ Explanation: Everyone has a fingerprint that is unique to you, which makes fingerprints one of the best ways to identify a suspect. There many different types of fingerprints, here are some summarized: https://www.touchngoid.com/8-common-fingerprint-patterns/

[2] Look for an example profile on our website.