



Lip-prints

Teacher Instructions

Goals:

Introduce students to the forensic techniques of print comparison and paper chromatography.

Provide the opportunity for students to practice critical thinking skills and inquiry.

Materials:

Lipstick (3 different brands, all the same color) You may wish to buy one set of tubes per group of students or ask them to share a set of common tubes.

Label tubes A, B, and C.

Filter paper (Whatman #1 works well) in large enough pieces to cut 8" by 1/2" strips. You will need 4 strips per student group.

Small glass beakers (25 or 50 ml)

Glass graduated cylinders (50 or 100ml)

acetone (available at most hardware stores)

rubbing alcohol (70% isopropanol)

metric rulers

pencils

dissecting microscopes or hand lenses

envelopes

Instructions:

This activity consists of two parts. The first part is simply a set of written questions to lead students through the thought process of how a forensic scientist might analyze a lip print. You may wish to do this part of the activity as a discussion rather than a written assignment. You may also skip this activity and proceed to Part Two.

Part Two is a hands-on analysis of lip prints and lipstick chemical composition. It is made to go along with the crime scene scenarios developed by the Hughes Initiative.

1.) Prepare the following for each student group.

an envelope containing a sample of the lipstick found at the scene of the crime, prepared for chemical analysis (marked "lipstick : evidence"). This envelope should contain one 8" by 1/2" strip of filter paper with a line of lipstick drawn 2 cm from one end. The lipstick used to make this mark should be labeled "C".

an envelope containing a partial lip print on a paper surface (marked "lip print: evidence") To make this lip print, you or another person should apply lipstick to your lips and press your lips to a small square of white paper. Cut-out a small piece of the lip print and place it in the envelope. Discard the remaining part of the print.

three tubes of lipstick -- one tube of the brand and color of lipstick used by each of the three suspects (marked "A", "B", and "C")

three envelopes containing lip prints of each of the suspects on paper (marked "A", "B", and "C"). Follow instructions above for making lip prints, except do not cut the prints. Leave them intact. The lip print that goes in envelope C should be from the same person as the evidence print. The other two prints should be from different people. Try to get people with very different lip shapes.

Use the following key to check how each lipstick or envelope should be labeled.

envelopes containing lip prints:

evidence = *same as suspect C*

Suspect A = non-matching suspect

Suspect B = non-matching suspect

Suspect C = matching suspect

lipsticks:

A) non-matching suspect

B) non-matching suspect

C) *matching suspect*

2.) Prepare a solution of 50% acetone and 50% rubbing alcohol. Store in sealed, labeled, glass containers. **NOTE: Acetone produces unpleasant, noxious fumes. Use in a well-ventilated area or under a hood. Both acetone and rubbing alcohol are flammable.**

3.) Have students follow procedure described in student handout for Lipstick: Part Two. The chromatography analysis requires the strips to run first overnight and a second time for 45 minutes.