Figuring Out Fingerprints (Superglue Fuming)

Sections

Joey Scouts
Cub Scouts
Scouts
Venturer Scouts
Rover Scouts

Scouts VICTORIA

Last updated: May 13, 2023, 10:03 p.m.

Challenge Areas

COMMUNITY
CREATIVE
OUTDOOR
PERSONAL GROWTH

Scout Method Elements

COMMUNITY INVOLVEMENT
LEARNING BY DOING
NATURE AND THE OUTDOORS
PROMISE AND LAW
PERSONAL PROGRESSION
PATROL SYSTEM
SYMBOLIC FRAMEWORK
YOUTH LEADING, ADULTS SUPPORTING

SPICES Growth Areas

CHARACTER
EMOTIONAL
INTELLECTUAL
PHYSICAL
SOCIAL
SPIRITUAL

The Adventure

Take a dive into the world of forensic science and learn about fingerprint analysis.

Plan

1. Investigate fingerprint analysis, what it is and what are some of the underlying principles. Why can they be used to assist investigation of crimes? There is lots of information available on fingerprinting but this is a good starting point.
2. Investigate types of fingerprints by looking at the features of a fingerprint supplementary and how they can be collected.
3. Investigate methods of collecting reference (known) fingerprints and fingerprint rolling.
4. Investigate why latent fingerprints (fingerprints which are invisible to the naked eye) are left on surfaces and if/how the surface affects the fingerprint.
5. Investigate the components of superglue and how it can be used for fingerprinting.
6. Read the safety information and discuss with your leaders or another appropriate adult what safety equipment, precautions, and supervision may be required. Ensure that you have these safety measures in place before starting the 'Do' section.
7. Gather all the equipment that you need to make your fingerprint analysis experience. You will need the following equipment: superglue that contains cyanoacrylate, ink, paper with names of individuals providing reference prints, a non-porous and non-white surface - laminated black paper works well - for collecting the suspect print, a heat-proof 250+ mL container, boiling water, aluminium foil, gloves (ideally nitrile), tweezers, blue tack, and a small bowl. You may also want to have a magnifying glass to help you inspect the prints closer.

Do

1. Clean the surface you will be depositing your fingerprint on with a cloth to remove excess fingerprints. This will help you develop a clean fingerprint for analysis. A glasses cleaning cloth work or alcohol wipe well.
2. Deposit a print onto the surface. The print will develop best if it is fresh and oily but when laying the print you should only lightly touch the surface so that the prints are not obscured. You may wish to run your hands through your hair, rub your finger on your forehead, or rub some moisturiser into them prior to depositing the print onto the non-porous surface. Once you have laid your print, you will want to minimise how much you touch the surface and how many excess prints are laid. As such, it is advisable to wear nitrile gloves, only handle the surface by the edges, and/or use tweezers to handle the surface.
3. Make sure that the ingredients of your superglue include cyanoacrylate, and ensure that you are using a previously unopened tube. If the tube has been opened, it should be less than a month since this was done.
   3 . Half fill the 250+ mL container with boiling water and cover with a sheet of aluminium foil. Make sure that foil is tight across the top of the bowl.
4. Using blue tack, attach the fingerprinted surface to the inside of the bottom of the small container with the fingerprint facing up
5. Add a few (approximately 2-3) drops of superglue to the foil next to the surface with the suspect fingerprint.
6. Create a miniature fuming cupboard by placing a small bowl upside down over the superglue and the surface with the suspect fingerprint. Once the superglue has been added, you should work quickly to minimise the loss of superglue fumes.
7. Allow the print to sit in the fuming cupboard for about 15 minutes, checking the progress of the print's development every 5 or so minutes by carefully lifting the bowl. Continue covering the print until it has developed.
8. Compare the suspect print to the reference sample and determine the individual that the suspect print came from. Try to identify the type of pattern and at least 5 points of minutiae.

Review

1. Did the print develop as you expected it to?
2. What could you do that you think would improve the visualisation of the fingerprint? Do you think fuming the print for more or less time would help?
3. What did you enjoy most about fuming a fingerprint? What did you learn?
4. Do you think the surface that the fingerprint is deposited onto will affect the result? Why or why not?

Safety

- Superglue and this technique use cyanoacrylate, which is toxic. Make sure to use it in well-ventilated areas and avoid accidental inhalation. Be careful when lifting the fuming cupboard as there will be concentrated superglue fumes. This is especially important if more than a few drops of superglue is used on the foil
- Superglue bonds and there is the risk that you could stick your fingers together. If you get superglue on your fingers, make sure to keep your fingers apart to avoid them sticking together. Superglue can be softened with a solvent such as acetone, which can be found in many nail polish removers.
- Superglue reacts strongly with some materials such as cotton and wool. It can also burn skin. Handle with care.

- This method uses boiling water. Take care when pouring to avoid burns and splashing. You may need an adult or older youth member to assist you with this.
- The bowl that forms the fuming cupboard will end up coated in a thin layer of superglue. As such, ensure that this bowl is no longer used for food.
- Fingerprints are unique and can be used to identify individuals. As such, privacy aspects should be considered such as using pseudonyms on the Fingerprint card, ensuring youth members take their own fingerprints with them or the fingerprints are destroyed after use.
- Whilst this activity can be performed by younger sections, higher levels of supervision and assistance should be provided especially when handling superglue and boiling water.

Variations

- This challenge card can pair well with other forensic science-based challenge cards such as other challenge cards in the 'Figuring Out Fingerprints' series, Who Wrote It? Paper Chromatography, and Soil pH Testing, to create a forensics program or a 'Whodunit' night. If you are running this activity as a 'Whodunit' night, it would be good to create some reference fingerprints and profiles as per Figuring Out Fingerprints (Rolling Fingerprints) using the Fingerprint Card Supplementary and the Reference Profiles Supplementary . You may also want to add a step to cut out the suspected area of the print so that it can fit in the fuming hood.
- The internet provides a range of different examples of homemade fuming cupboards. You may wish to look at these different methods to see which is most effective.
- Depending on the section, you can increase the difficulty of this activity by changing the number of reference fingerprints or changing the requirement of a successful match – i.e. if the youth need to just identify the individual or which finger it came from.
- Depending on the section and challenge area used, this challenge card can also be paired with a police station visit or some other law enforcement related community involvement.
- For a shorter activity or for younger sections, you can run this activity as an activity where youth members develop their own prints and identify the class of print (loop, arch, or whorl as per the Features of a Fingerprint supplementary rather than matching prints to suspect prints.