

Fingerprinting at Home

Crime scene investigators often look for latent fingerprints, prints that are not visible to the naked eye. In order to examine the prints they use specialized fingerprint powders such as silver nitrate. But other materials can be used at home to collect fingerprints using the same principles. Every contact leaves a trace. Powders adhere or react to the oils left behind to develop, or make visible, a fingerprint trace. Common household items can be substituted for fingerprint powders to experiment with collecting fingerprints at home.

Fingerprinting with Powders

Supplies:

- Fine powder (e.g., sifted cocoa powder, baby powder, talcum powder, or corn starch)
- Soft-bristled brush (e.g., make-up brush)
- Clear tape (e.g., Scotch tape)
- Index card or paper that contrasts with the powder (dark-colored for baby powder or light-colored for cocoa powder)
- Optional: Squeeze bulb air duster

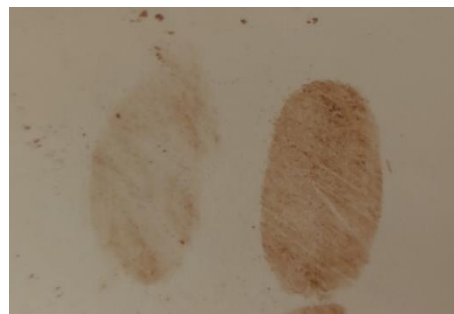


Make-up Brush and Cocoa Powder

1. Find a surface with fingerprints. A smooth, rigid surface like plastic or plexiglass will be the easiest place to collect prints.
2. Take a pinch of powder and sprinkle it on the area with the print. Be careful not to use too much powder, as you can overdevelop a print. This decreases the quality. You can also dab the brush in the powder and twist the brush back and forth to sprinkle the powder.
3. Use a soft-bristled brush to gently spread the powder. Use circular dabbing motions by slowly spinning the brush between your fingers. Be careful not to smudge or smear the print by brushing too hard or using a coarse brush.
4. Brush away the excess powder. You can also blow away the powder, however if the powder gets wet, the print will decrease in quality. A squeeze bulb air duster is ideal for blowing away powder. You should see that the powder has adhered to the now-visible print. If the print is not visible, repeat steps 2 and 3 again.
5. Once the print is visible, put a strip of clear tape on the print, ensuring that the tape is flat and completely covering the print. Hold on to a corner of the tape to make it easier to lift. Carefully remove the tape and place the tape on an index card or paper. The color of the card or paper should contrast with the color of the powder.



Squeeze bulb air duster



Cocoa powder sticks to the oils from the latent print.

Once you have practiced enough with your own prints, you can dust surfaces all around your house, such as doorknobs!

Cyanoacrylate Fuming

One of the most reliable ways for crime scene investigators to develop fingerprints is **cyanoacrylate (superglue) fuming**. This is a relatively simple method that you can do at home with household items—as long as you have a cyanoacrylate-based superglue.

Be Careful! This experiment requires adult supervision. Superglue-developed prints are difficult to remove, so make sure that the material you use is something you don't mind having a permanent fingerprint on. It's also very important that you do this outside or in a **well-ventilated area**.

Supplies:

- Cyanoacrylate-based superglue
- Airtight jar or container
- Aluminum foil
- Bowl of hot water
- Small smooth object or large flat smooth object

There are two methods of superglue fuming depending on the size and shape of the object you are using to develop fingerprints.

Small objects:

1. Firmly touch the object with your finger to leave behind a latent print.
2. Fold aluminum foil into a bowl shape and put 3-4 drops of superglue in the center of the foil.
3. Place foil in the bottom of an airtight jar or container.
4. Place small object in container as well ensuring that the print is exposed to air and not flat against the bottom or touching the walls of the container.
5. Place the **closed** container in a bowl of hot water. This will speed up the process of the superglue giving off fumes.
6. Let sit for at least 1 hour. Check to see if any fingerprints have developed. A cyanoacrylate-developed print will have an off-white appearance.
7. Once latent prints have developed, remove object from jar and analyze the latent print.



Airtight container, foil "bowl," and small object (poker chip)

Large flat object:

1. Firmly touch the object with your finger to leave behind a latent print.
2. Fold aluminum foil into a bowl shape and put 3-4 drops of superglue in the center of the foil.
3. Fill a bowl with hot water and place foil in bowl.
4. Use large flat object to cover the bowl. This creates an airtight environment for the fumes to develop the latent print. If there is space between the edges of the object and the bowl, the print will still develop but will take longer.
5. Let sit for 3-4 hours. This should be enough time for fingerprints to develop. Remove flat object, and you should see off-white prints. If not, repeat step 4 and let sit. Note that when you remove the object, any fumes in the airtight environment will escape, and it will take longer for prints to develop.



Foil "bowl," superglue, bowl of hot water, and large flat object (Blu-ray case)



Superglue fumes react with prints on Blu-ray case after 3-4 hours.

Analyzing Developed Fingerprints



LOOP



WHORL



ARCH

Once you've collected fingerprints, it is time to analyze them and try to link them to an individual. There are three types of fingerprint ridge patterns: loops, whorls, and arches. **Loops** start on one side and exit the same side. **Whorls** are a circular or spiraling patterns. **Arches** start on one side and exit the other.

Fingerprint examiners compare fingerprints collected from a crime scene to an **exemplar print**, which are fingerprints on record that have the full details of the print. Exemplar prints can be digitally scanned or collected using ink. You can create exemplar prints of your own by using ink or pencil lead. Use a sheet of paper and a pencil, pen, or marker to create your own "inkpad" as seen here.



If you have developed "unknown" fingerprints, try creating exemplar prints for each member of your household, and see if you can find a match! You should determine first the type of fingerprints for both the exemplars and developed prints. Each type has several subtypes, shown below. If you find a type match, try to determine the subtype.



PLAIN ARCH



TENTED ARCH



RADIAL LOOP



ULNAR LOOP



PLAIN WHORL



DOUBLE LOOP WHORL



CENTRAL POCKET WHORL



ACCIDENTAL WHORL