

Crime Scene Science: Fingerprinting

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Science can do many things - help us understand the world we live in, develop new technology, and even solve crimes! The science used to help solve crimes is called **forensic science**. Almost every scientific field could be involved in forensics in some way: chemists, psychologists, pathologists (diseases), botanists (plants), odontologists (teeth), entomologists (insects), and anthropologists (humans). So if you study forensics, you might use physics for comparing densities and investigating bullet impact; chemistry for identifying unknown substances, such as white powder that could be a drug; biology for identifying blood and DNA; and earth science for soil evidence.

Even with all the new technology we have to analyze a crime scene, one of the most important pieces of evidence is still a person's fingerprints! We leave behind fingerprints almost every time we touch something, and since every person has a unique set of prints, they are a great tool for identification. Look at your fingertips with a magnifying glass: The patterns you see are caused by ridges in the dermis, the bottom layer of your skin. These patterns are fully developed in human beings just seven months after conception, while still in the womb. The three typical patterns are **loops** (found in 65% of the population), **whorls** (found in 35% of the population), and **arches** (found in 5% of the population). While your fingerprints are different from anyone else's, fingerprint patterns tend to run in families. If your fingerprints are a whorled pattern, there's a good chance one of your parents has a whorled pattern too.

>> **Download our [Fingerprint Analysis Sheet](#)** to learn about the different types and features of fingerprints and to practice fingerprint identification!

Some fingerprints are visible - you can see marks left on a surface by dirty or oily fingers. Dusting is usually used for this type. Other prints are latent - you can't see them, but there are marks left by sweat, amino acids, and other organic residue from fingers. Fuming is often used for these. Do the following projects to learn both methods!



Dusting for Fingerprints

Hard surfaces often show fingerprints when dusted with a very fine powder.



What You Need:

- **Microscope slide** (or other smooth, flat object)
- **Fingerprint powder** or any fine powder (such as talcum powder, cornstarch, or cocoa powder)
- **Fingerprint brush** (or any small brush with very soft bristles)
- Clear tape

Note: Fingerprint powder is very messy, so practice with it in a controlled area. Start out dusting a microscope slide to get the technique down and then you can move on to dusting other surfaces in your house.

What You Do:

1. Touch a microscope slide with your finger a few times to leave prints. (If you want, use lotion on your hands for more obvious prints.) Set the slide on a piece of paper before dusting, for easier cleanup.
2. Sprinkle a little bit of powder on the microscope slide, then gently swipe off the excess powder with the soft brush, being careful to leave the fingerprint intact. This may take some practice to get right.
3. Stick a piece of clear tape over the fingerprint firmly, and then lift it up; the print should adhere to the tape. You can then stick it to contrasting paper to maintain a record of the print.
4. After you become proficient with dusting a slide, try to test other surfaces like doorknobs or faucets.
5. See if you can identify any of the prints you develop. To do this, take the prints of your family members and compare the known prints with the "mystery" prints. Color a couple square inches on a piece of paper with a pencil, have a family member rub their finger on the square to pick up graphite, then have them press their finger down on the sticky side of a piece of tape. Stick the tape to a white sheet of paper and label whose print it is. Compare the known prints to a print you lifted around the house using the procedure on the **Fingerprint Analysis Sheet**.

What Happened:

Oils from your finger left an impression of your prints on the slide. When you brushed the powder off the smooth slide, some of it stuck to the oils, allowing you to see the patterns.

Experiment with...**Crime Scene Science Kit**

Solve the 'Mystery of the Disappearing Diamonds' with this crime scene lab kit! With it kids will perform seven fun & detailed experiments to determine which of four suspects is responsible for stealing the precious stones. Projects include dusting and fuming for



fingerprints, fingerprint analysis, chromatography & ink analysis, blood type analysis (using simulated blood samples), and fiber analysis using a flame test.

Fuming for Fingerprints

Another method for finding fingerprints is called "fuming." This works for many surfaces where fingerprint powder doesn't work so well, and also for prints on portable objects. With this technique, chemical fumes react with the organic substances in fingerprints (amino acids, etc.) to cause invisible prints to appear.



What You Need:

- **Microscope slide** (or other small, smooth object)
- **Small airtight jar** or container
- Piece of aluminum foil
- Superglue
- Cup or bowl of hot water

Note: Be careful with the superglue - get an adult's permission.

What You Do:

1. Touch the microscope slide with your finger to leave latent prints on it.
2. Place the piece of aluminum foil in the bottom of the airtight container. Put 3 drops of superglue on the center of the foil.
3. Place the microscope slide in the container (don't let it touch the glue; you may need to prop it up diagonally). Put the lid on tightly.
4. Place the container in a cup or bowl of hot water. The heat will cause the superglue to give off fumes more quickly.
5. After 15-20 minutes check the microscope slide to see if any prints have developed on it. They will appear an off-white color and can be seen well if you hold the slide up to the light or over a piece of black paper.

What Happened:

Certain chemical fumes react with the sweat and other organic residue left in latent fingerprints. The strong chemical fumes from the cyanoacrylate in the glue will react with the residue from your fingers. The chemical reaction causes the residue to turn white so you can see it. Professionals also use ninhydrin (which reacts with amino acids in latent prints) and silver nitrate powder developed under a UV light.

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By: rhythm sanghi
Date: Jun 16, 2015
it is a fantastic article

By: Stephen
Date: Mar 01, 2015
i got my own lab you can use kitchen or a spare room i in uk and took over most off the house my mum and dad get fed up tho i also into medical sciences