

# Finding Fingerprints!

## Background:

Have you ever looked at your own fingertips? Or compared them to another person's? Well if you have, then you probably have noticed that each person has a slightly different pattern. Forensic scientists are often able to find fingerprints at crime scenes in order to connect a person, whether the suspect or victim, to a location, item (or collection of items), or another person. This practice is called forensic biology. This activity will teach you how to lift fingerprints from objects just like a real forensic biologist by using common household items. Fingerprints can be left in a variety of ways. You have probably noticed that when your hands are very dirty or oily you leave very visible handprints on anything you touch.



Fingerprints that are visible with the naked eye are called patent fingerprints. What you probably have not noticed is that any time that you touch anything you leave behind an invisible fingerprint. These invisible prints are called latent fingerprints, and hopefully by the end of this exercise you should be able to lift them from a surface!

Latent fingerprints are made of the natural water and oils that your skin produces. This oil sits in between the lines at the tips of your fingers, so that when you touch something the oil transfers to that surface. Take a second to think about how you would make something made of oil visible. Do you think we could use a dye? How would we be able to make the dye stick to the oil? The easiest method is to use a powder that is a very different color than whatever surface you are using. The very fine powder sticks to the lines of oil, making them visible against the surface. If you were trying to lift a fingerprint off a dark surface, a white powder would create the best contrast. If you were trying to lift a fingerprint off a light surface, a darker powder would work better. Once the fingerprint becomes visible, you can gently lift it off the surface using a clear piece of tape!



Now it is your time to try to lift fingerprints! You can start by using your own fingerprints and seeing if you can clearly see the patterns in your fingerprint. This may take a few tries to get a clear print. Next, you could try to compare your fingerprints to those of your family. If you get very good at lifting fingerprints, you could even ask your family to stage a "crime"\* and use your detective skills to see if you can figure out who did it!

\*Crime scene examples: Who stole the cookie? Who left the lights on last in the room? Who drank my water?

Materials: \*Make sure to get your parent's permission before dusting any surface!\*

1. Glass or smooth metal surface
2. Dusting powder
  - For a light surface try:
    - i. Raw cacao powder
    - ii. Cocoa powder
    - iii. Hot chocolate mix
    - iv. Spirulina powder
  - For a dark surface try:
    - i. Baby powder
    - ii. Baking powder
    - iii. Powdered sugar
    - iv. Makeup setting powder
3. Paper
  - If dusting using a dark powder like cacao or spirulina, use white paper
  - If dusting using a white or light powder like baby powder, use dark paper
4. Small bowl
5. Clear tape
6. A fine brush with soft bristles, such as a makeup brush
7. Dust cloth
8. Water
9. Soap
10. Hand lotion

Instructions:

1. Choose a smooth surface (such as glass or metal) and wipe it with a dust cloth. Press your finger of choice onto the smooth surface you chose.
2. Look at the surface and see if you can spot where you left your fingerprint. Can you see it?
3. Figure out which color powder is best to use on the surface your fingerprint is on. If the surface is dark, use a lighter colored powder. If the surface is light, use a darker colored powder. This makes it easier to spot the fingerprint you left.
4. Dip your brush into the powder and tap off the excess powder. Gently brush it onto the surface with your fingerprint, making sure not to press too hard. You don't want to wipe the fingerprint away!
5. Blow the extra powder off the surface and examine your dusted fingerprint. Is it easier to see the fingerprint now?

6. Carefully press a clear piece of tape onto your fingerprint. Then peel the tape off to transfer the fingerprint to a piece of paper. If you used dark powder to dust your fingerprint, transfer it to light paper. If you used light powder to dust your fingerprint, transfer it to dark paper.
7. Now that your fingerprint has been transferred to paper, look at its structure. Does it look the same on paper as the smooth surface?
8. Wash your hands with soap and warm water. Do steps 1-7 again using the same finger as you did last time, and compare the two fingerprints. Is it easier or harder to see the new fingerprint?
9. Apply lotion to your hands and repeat steps 1-7, using the same finger as the last two times. Looking at all three fingerprints, which is the easiest to see? Which is more detailed? Which is less detailed?
10. Now that you're a fingerprint collecting pro, try it out on different surfaces! If you want an extra challenge, try to find some fingerprints on surfaces in your house. Think of objects that your family touches often, like countertops, door knobs, and handles.
11. If you want to see how your fingerprint is different from other people in your household, ask them if you can collect their fingerprints too! See if you can spot the things that make your fingerprint unique.

**Having trouble seeing your fingerprints? Try making this DIY magnifying glass!**

Materials:

1. A clear plastic bottle
2. A sharpie or pen
3. Scissors
4. Water

Instructions:

1. Draw a circle at the neck of the bottle (right below the opening you drink out of). You have to draw the circle here so that the circle will be slightly rounded.
2. Cut out the circle.
3. Put a couple drops of water in the circle.
4. Hold it over your fingerprints to magnify them!

### **Why are some fingerprints more visible than others?**

If you completed the experiment, you might've found it very hard to collect a fingerprint after you washed your hands. This is because the sweat and oil was washed off your hands. The more oil and sweat present, the more pronounced the fingerprint will become. The fingerprint you collected after putting lotion on your hands should be the easiest one to see and have the most detail.

Sources:

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