



High Touch High Tech[®]

Science Experiences That Come To You

Fingerprinting

Ingredients & Supplies:

- Pencil
- Roll of Scotch tape
- Fingerprint activity template
- Fingerprint patterns worksheet
- Bottle of hand lotion
- Cocoa powder, baby powder or powdered paint
- Paper plate
- 9 oz plastic cup
- Paintbrush

Instructions:

Everyone has his or her own unique fingerprints. Dermatoglyphics is the scientific study of fingerprints. Identical twins have the same genetic makeup, but each has different fingerprints! Identical twins form when a single fertilized egg separates. But, as the individuals develop various environmental factors during pregnancy affect fingerprints. The mother's nutrition and blood pressure, along with the embryo's growth rate will change the fingerprints.

Try this activity to discover what type of fingerprints you have! You need one pencil and one roll of scotch tape. You also need the Fingerprint activity template and the Fingerprint patterns worksheet.

Using the pencil, scribble a small section on the Fingerprint Worksheet. Next, rub your right thumb over the pencil scribble mark. You want the tip of your thumb to be covered with pencil graphite. Finally, take a piece of Scotch tape and stick it onto your finger. The tape should cover the graphite. Now, you will "lift" the print. Carefully pull the tape off your thumb, and stick the tape to the appropriate box to leave your print.

Now look at the Fingerprint patterns worksheet. What type of print do you have? Does the fingerprint have *arches*, *loops*, or *whorls*? Try your other fingers. Do the prints look different or similar? Ask a parent or sibling to try this activity. What do you notice? How are your fingerprints similar or different?

Now that you have identified what type of print you have, you can do another cool experiment! If you dust an area with a contrasting colored powder, you can lift fingerprints! This is called "dusting for prints."



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For this experiment, you need one 9 oz. plastic cup, one paintbrush, the roll of Scotch tape, and a small bottle of lotion. You also need a small plate of powdered paint or cocoa powder.

Your fingers naturally have oil on them. But, to get a great fingerprint, you need a little extra oil on your finger. Put a small drop of lotion on your fingertips. Rub them together. Next, press one finger on the side of the 9 oz. plastic cup. Sprinkle your powder on the side of the cup. This powder will coat the fingerprint. Gently brush the powdered area with your paintbrush. When you have brushed off the loose powder, you should see your fingerprint!

The Science Behind It:

Forensic Fingerprints - A “forensic scientist” helps solve crimes. The scientist uses different experiments and analyzes evidence to find clues at a crime scene. When a forensic scientist finds fingerprints, he or she can identify the perpetrator! Forensic scientists use expert computer systems to look at the details of the print. The scientific study of fingerprints is called *dactyloscopy*.

It wasn't until the late 1800's that fingerprints were used as evidence to link a perpetrator to a crime. Forensic scientists have always used the simple method of dusting with powder. More complex systems use chemicals in a laboratory. There are hundreds of different ways to identify fingerprints. As more technology arises, the techniques of *dactyloscopy* become more advanced and accurate.

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Fingerprint Activity Template

R Thumb

A large, empty rectangular box with a black border, intended for a right thumb fingerprint.

R Index

A large, empty rectangular box with a black border, intended for a right index fingerprint.

R Middle

A large, empty rectangular box with a black border, intended for a right middle fingerprint.

R Ring

A large, empty rectangular box with a black border, intended for a right ring fingerprint.

R Little

A large, empty rectangular box with a black border, intended for a right little fingerprint.

L Thumb

A large, empty rectangular box with a black border, intended for a left thumb fingerprint.

L Index

A large, empty rectangular box with a black border, intended for a left index fingerprint.

L Middle

A large, empty rectangular box with a black border, intended for a left middle fingerprint.

L Ring

A large, empty rectangular box with a black border, intended for a left ring fingerprint.

L Little

A large, empty rectangular box with a black border, intended for a left little fingerprint.

Lead Rubbing Box

A large, empty rectangular box with a black border, intended for a lead rubbing activity.



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Fingerprint Patterns



Double Loop



Arch



Central Pocket Loop



Loop



Accidental



Tented Arch



Whorl



Loop