



Mystery at the Museum

What is Forensic Science?

Forensic science is the application of science and technology to solve crimes. Forensic science is often sensationalized in TV shows – it's certainly not as easy or as quick as they make it seem!

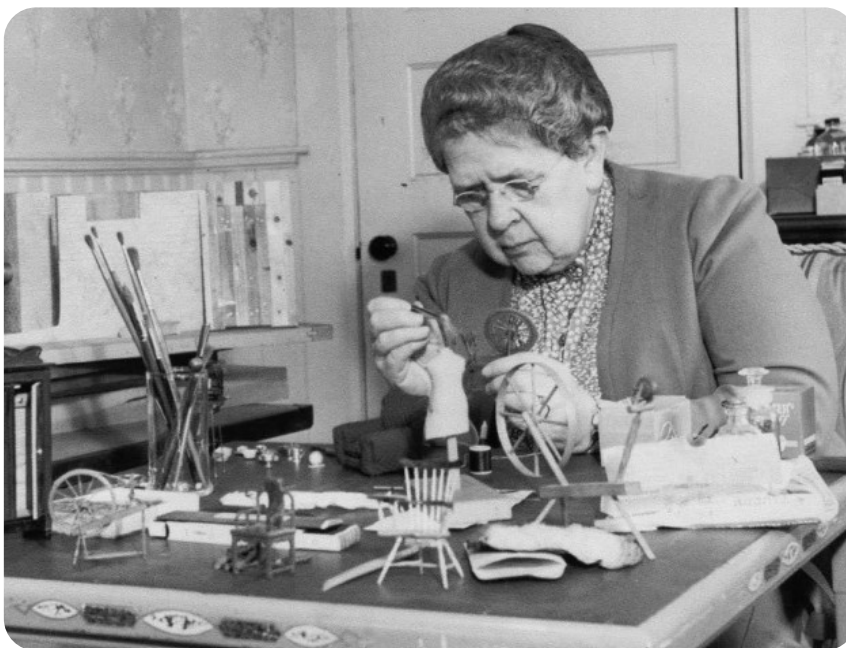
Forensic science draws upon a variety of scientific disciplines, including biology, physics and chemistry. A forensic scientist collects and analyzes scientific evidence (clues) during an investigation. There are many types of forensic science and people may specialize in a certain area. Some are experts at studying DNA, some study human anatomy (how the body works), others may study entomology (insects) and there are even forensic archaeologists who study mysteries of the past.

Fingerprinting

Fingerprinting is probably one of the most well-known of the forensic techniques. It is based on the idea that one can match the unique patterns of whorls on a finger to prints left at a crime scene. You will often see proclaimed that “no two people have identical prints,” but scientifically this has never been proven or carefully researched. There are also no uniform/national standards on what to measure to determine if two fingerprints match. Using different systems can result in different results.

As with any scientific investigation, scientists need lots of evidence before they can make a claim that something is true. Fingerprints are only part of the wider body of evidence needed to solve a mystery or a crime.

Now that we've learned about fingerprints, it's time for you to do some of your own investigations.



Scientist Spotlight

Frances Glessner Lee (1878-1962) was an early pioneer in forensic crime solving. She created miniature crime scenes that she referred to as Nutshell Stories to help solve crimes. These amazing dioramas are still used today for teaching purposes in Maryland. She was appointed as captain in the New Hampshire State Police in 1943 and was the first woman to fill that role in the United States.

COURTESY OF THE GLESSNER HOUSE MUSEUM, CHICAGO



Activity 1: Understanding Fingerprints

What do your fingerprints look like? A great way to easily see your fingerprints is to use a balloon to magnify it. Fingerprints can be categorized into three basic types: arch, loop or whorl. They can also be a mixture of all three of these patterns.



ARCH



LOOP



WHORL

What You'll Need

- Light colored balloons
- Ink pad
- Paper
- Scotch tape
- Your fingers

What You'll Do

- Dip your finger in the ink pad.
- Gently press your finger onto a deflated balloon.
- Carefully lift your finger directly up from the balloon without smudging.
- Wipe the ink off your fingers.
- Allow the ink to dry.
- Once the ink is dry, blow up the balloon and tie the end.
- The fingerprints should now be large and easy to see.
- Do this for more than one finger.
- Study the fingerprints and look for the three basic patterns. Which ones do you have? Is it different for different fingers? What about each hand? Do this for family members, too. Are there any that are similar? Are any identical?





Activity 2: Build Your Own Fingerprinting Kit!

Latent prints are the impressions of the fingers that have been transferred to another surface.

Moisture and grease from your fingers result in latent fingerprints on a hard surface.

These are different than a print made by an impression (for example, pressing your finger into clay).

This kit will help you find and collect latent prints.

What You'll Need

- Scotch tape
- Small sandwich zip-top bags or small, tightly lidded containers.
- 1 large gallon zip-top bag
- Cocoa powder
- Flour
- Soft, wide makeup brush
- Sheets of light colored and dark colored paper (index cards work, too)
- Drinking glass (ceramic will work, too, just not plastic)
- Pen or pencil for labeling

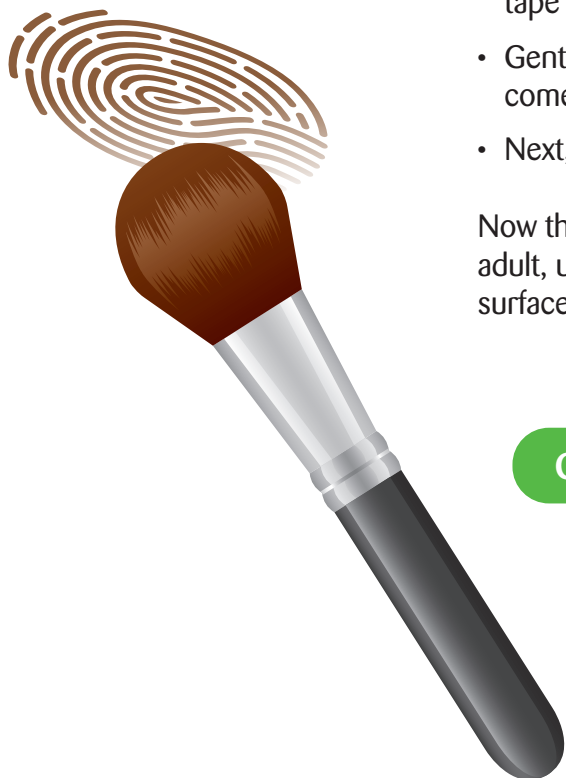
What You'll Do

- Put some of the cocoa in a zip-top bag (or small container) and seal it. Do the same with your flour. This is your fingerprinting powder.
- In the large bag, put your brush, sealed powders, tape, pencil and paper inside.
- This is your fingerprinting kit that you can now take with you on your investigations!

Test Your Kit:

- Press your fingers around the drinking glass. (Oily fingers leave better prints.)
- If the surface is light colored, gently coat the fingerprints with a dusting of cocoa powder using the soft brush. If you have a darker surface, use the brush to gently coat the fingerprints with a dusting of flour.
- Observe what happens.
- Place the sticky side of the tape on the dusted fingerprint. Make sure to hold the two ends of the tape off the surface – don't completely lay the tape on the glass.
- Gently lift the tape off the glass. What happens? The print should have come away with the tape.
- Next, tape the print to the paper and label it.

Now that you have the technique down, and with permission from an adult, use your kit to find and collect other fingerprints left on hard surfaces all over your house!



Good luck during your investigations!

