



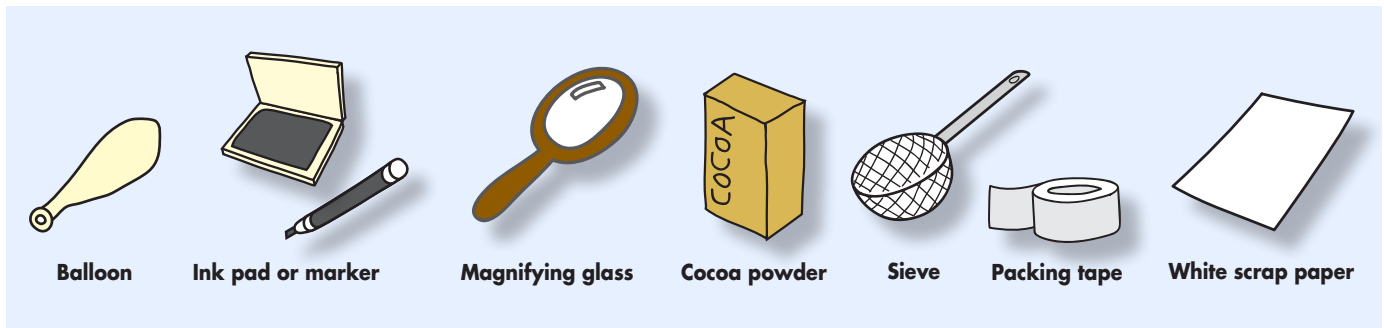
Learn the Secrets of Fingerprints

Check out the videos of this activity on the [Detective Science, Latest Updates page](#)

Find What You Need..

- A balloon
- Ink pad or marker – these need to contain *water soluble ink!*
- Magnifying glass
- Cocoa powder
- Sieve
- Packing tape
- White scrap paper

Allergy Alert:
If you're allergic to cocoa or chocolate, you can use baking powder instead – just make sure you use a dark colored balloon!



How can you match a fingerprint to a person?

You've heard that police use fingerprints to solve crimes. Here's why: fingerprints are one of the best and easiest ways to identify a person. Fingers have slightly raised lines that form patterns, and every finger has its own unique pattern. Natural oils from the skin are left behind when a person touches something, leaving a fingerprint pattern. *Forensic* (detective) scientists study fingerprint patterns to match them to a particular person.

Often, scientists have only part of a fingerprint to study. Look at the print shown on the left. That's a "latent" or unknown print that detectives found. If you were a forensic scientist working in a lab, you would use a latent print to try to find a match among thousands of "known" prints in the police's computer files. How do scientists – with the help of computers – search for matches? They look for basic types of patterns in the fingerprint lines. Three of the basic patterns are shown on page 2. They

are called, in order, *Plain Arch*, *Ulnar Loop*, and *Plain Whorl*.

In this activity, you'll find a new way to enlarge your prints, then you'll learn how to *lift* (gather) prints like a detective.



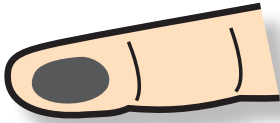
Fact:
Other ways of identifying people include scanning the patterns in their irises ("eyeballs") or analyzing their voices.

Activity Instructions

Part I: Ballooning Prints

Tip: Balloons are also a lot easier to inflate if you first cool them in the freezer.

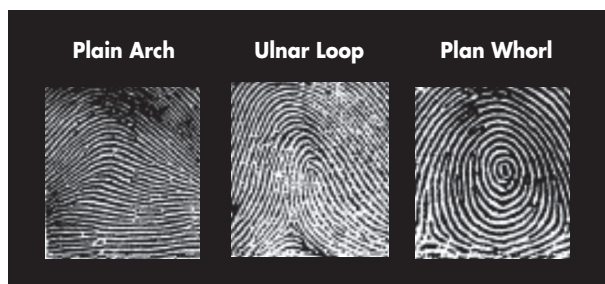
1. Choose a finger. Press your finger pad straight down onto an ink pad, or gently color it with a marker.



2. Press your inked finger straight down onto the balloon. Don't slide it around or the print will smear!
3. Wait a few minutes for the first print to dry. Then repeat steps 1 and 2 with a different finger and make another print on a clean part of the balloon. Try one more finger if there's room on the balloon.
4. Blow up the balloon slightly so the prints get larger. If they look blurry, let out some air until they are clearer.



5. Compare your prints to the patterns in the photo below. Do you have a loop, whirl, or arch at the center of your print? Are both prints the same?



Part II: Lifting (Gathering) Fingerprints

6. Now you're going to find some "hidden" prints. But first you have to make them. Press your finger pads onto a smooth, clean glass or plastic surface.

Tip: To leave clearer prints, first run your fingers over your forehead, scalp, or sides of your nose to collect more oil.

7. Slowly dust a *thin* layer of cocoa powder over the surface containing your prints. We found this easiest to do by spooning cocoa powder into a sieve, then dusting the plate. You could also use a paintbrush to brush it on.
8. Hold the plate over a sink or trash can. Tilt the plate and gently tap it to remove extra powder.
Tip: You can also blow gently on the plate until you see only a faint powder pattern where the prints were.
9. Carefully place a piece of packing tape straight down over the prints and press it down.
10. Lift the tape off and stick it to a piece of white paper. Check it out with a magnifying glass. Could you identify these prints as yours?

Conclusions

Could you see the patterns on your fingerprints? Are the prints on your different fingers all the same or different? How might a fingerprint expert choose from thousands of prints to find a match for a latent print? Watch the videos on KidScienceChallenge.com to see how a fingerprint expert works with a latent print in the lab.

Brain Squeezer:

If you had a machine that could scan fingerprints to identify people, what would you use it for?



Kids' Science Challenge
Science Projects
are presented by
the award-winning
radio series,
Pulse of the Planet



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