



Fingerprints

8th Grade Forensic Science

Fingerprint Principles

According to criminal investigators, fingerprints follow 3 fundamental principles:

- A fingerprint is an **individual** characteristic; no two people have been found with the **exact** same fingerprint pattern.
- A fingerprint **pattern** will remain **unchanged** for the **life** of an individual; however, the print itself may change due to permanent scars and skin diseases.
- Fingerprints have general characteristic **ridge** patterns that allow them to be systematically identified.

Fingerprint Classes

There are 3 specific classes for all fingerprints based upon their visual pattern: arches, loops, and whorls.



Each group is divided into smaller groups as seen in the lists below.

Arch

Plain arch
Tented arch

Loop

Radial Loop
Ulnar loop

Whorl

Plain whorl
Central pocket whorl
Double loop whorl
Accidental

Interesting Info

Fingerprint Factoid:

**60% of people have loops, 35% have whorls,
and 5% have arches**

Did you know?

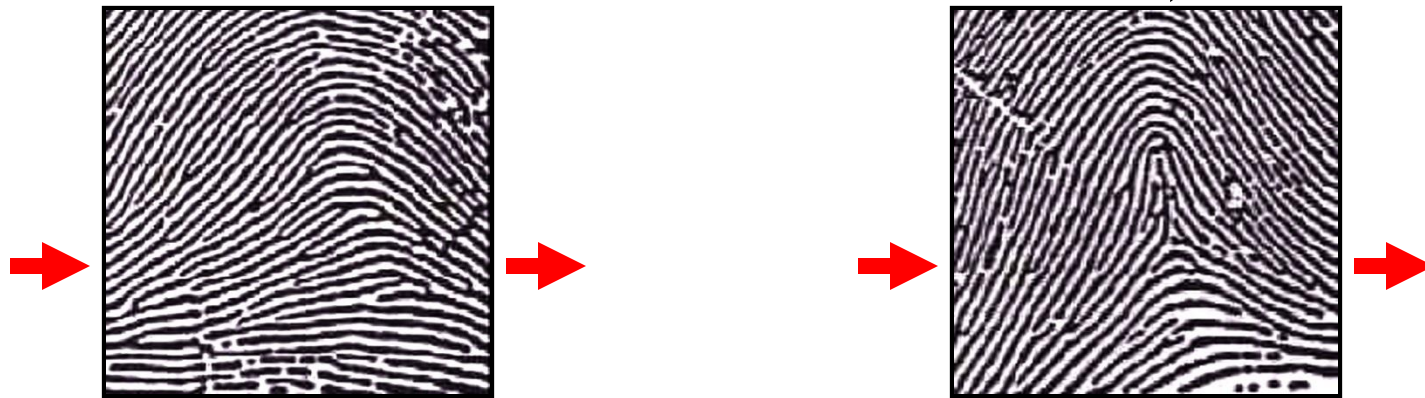
Dactyloscopy is the study of fingerprint identification.

Police investigators are experts in collecting
“dactylograms”, otherwise known as fingerprints.

ADD TO NOTES

Arches

Arches are the simplest type of fingerprints that are formed by ridges that enter on one side of the print and exit on the other. No deltas are present.



Plain Arch

Ridges enter on one side and exit on the other side.

Tented Arches

Similar to the plain arch, but has a spike in the center.

Loops

Loops must have one delta and one or more ridges that enter and leave on the same side. These patterns are named for their positions related to the radius and ulna bones, i.e. the bone the loop opening is facing towards.



L – Radial Loop
R - Ulnar Loop



Delta

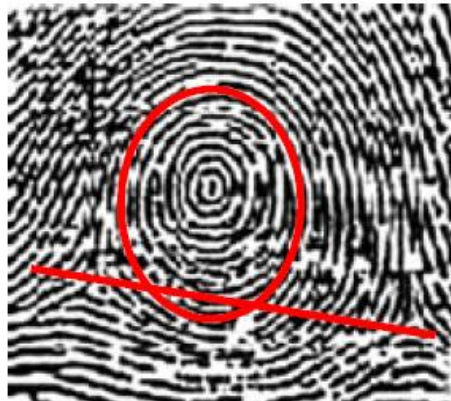


L – Ulnar Loop
R - Radial Loop

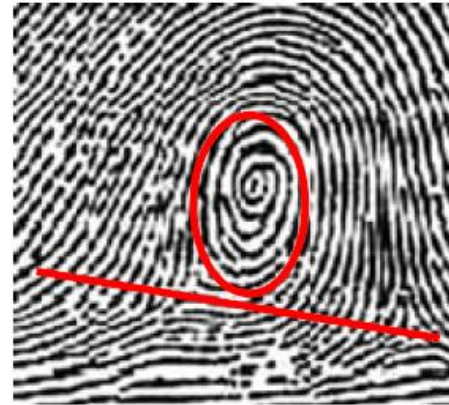
Whorls

Whorls have at least one ridge that makes (or tends to make) a complete circuit. They also have at least two deltas. If a print has more than two deltas, it is most likely an accidental.

Plain
Whorl



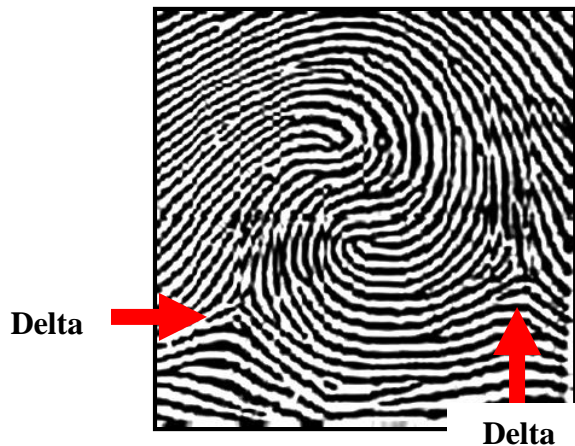
Central
Pocket
Whorl



Draw a line between the two deltas in the plain and central pocket whorls. If some of the curved ridges touch the line, it is a plain whorl. If none of the center core touches the line, it is a central pocket whorl.

Whorls – Part 2

Double Loop Whorl



Double loop whorls are made up of any two loops combined into one print.

Accidental Whorl



Accidental whorls contain two or more patterns (not including the plain arch), or does not clearly fall under any of the other categories.

Identify each fingerprint pattern.



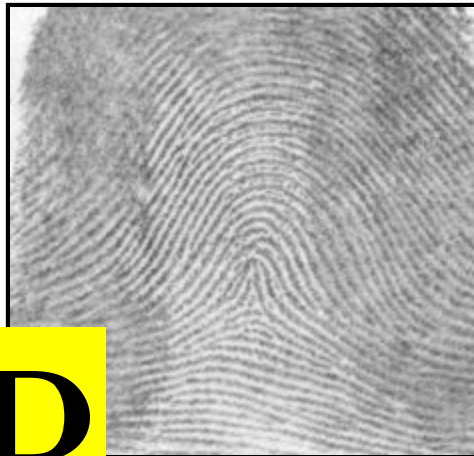
A

Left Hand



B

Right Hand



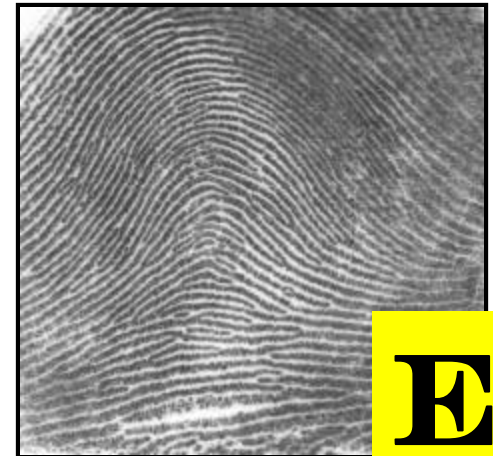
D

Right Hand



C

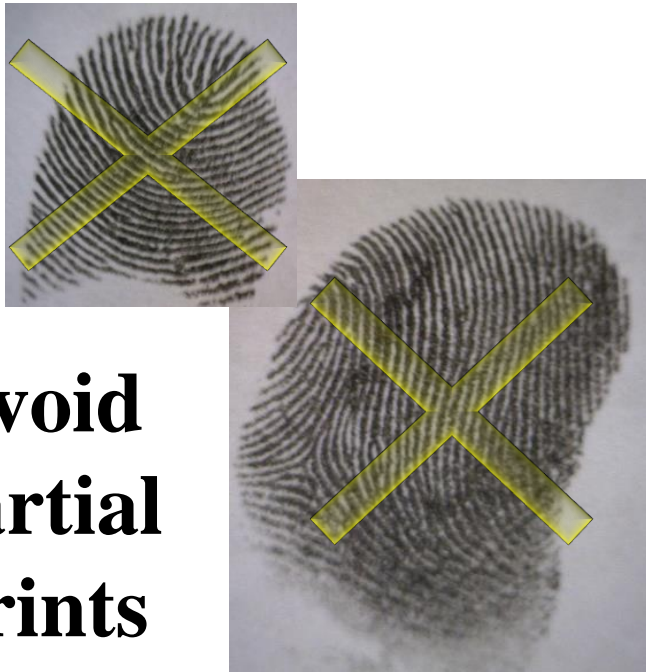
Right Hand



E

Left Hand

It's time to make some prints!



**Avoid
Partial
Prints**



GOOD PRINT
Get as much of the top part
of your finger as possible!

Directions

1st – Roll the “pad” portion of your thumb over the ink pad from the left side of your thumb to the right. You do not have to push down really hard!



2nd – Roll the “pad” portion of your thumb from the left side of your thumb to the right in the correct box on your paper to make a thumbprint.

3rd – Continue this process to make a fingerprint of all ten fingers on the “My Prints” worksheet.

4th – Use your notes and a magnifying lens to help you figure out what type of pattern is found in each of your fingerprints. Label each one with the pattern’s name.