

Name _____

Period _____



Unit 3: Focus on Fingerprinting

Skills:

1. Fingerprint Background

2. Characteristics of Fingerprints!

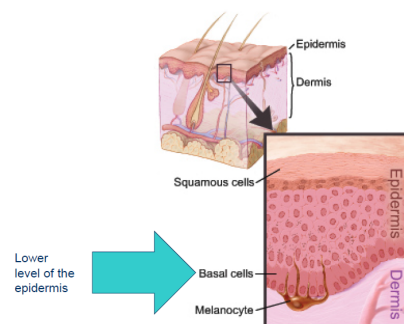
Skill 1: Fingerprint Background

WHAT ARE FINGERPRINTS?

- All fingers, toes, feet, and palms are covered in small ridges. These ridges are arranged in connected units called *dermal*, or _____, *ridges*.
- These ridges help us get or keep our _____ on objects.
- Natural _____ plus dirt on these surfaces leave behind an impression (a print) on those objects with which we come in contact.

LOCATION OF FINGERPRINTS

- An animal's external tissue (skin) consists of an inner dermis and an outer epidermis
- The creation of fingerprints occurs in a special layer (the _____ layer) in the epidermis where new skin cells are produced.



FORMATION OF FINGERPRINTS

Fingerprints begin forming approximately at the start of the _____ week of pregnancy.

- It is believed that no two mammals have the same fingerprints because everyone's _____ in-utero is different
- Because the basal layer grows faster than the others, it _____, forming intricate shapes.

There are 3 types of prints that investigators look for at crime scenes:

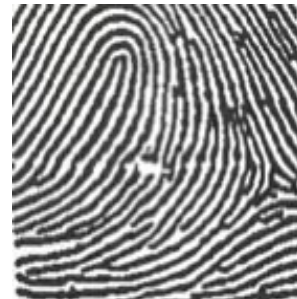
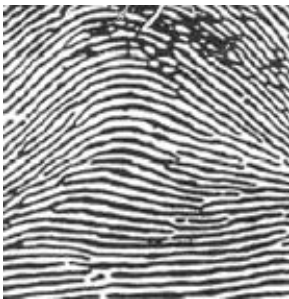
1. _____ fingerprints are visible prints transferred onto smooth surfaces by blood or other liquids.
2. _____ fingerprints are indentations left in soft materials such as clay or wax.
3. _____ fingerprints are not visible but made so by dusting with powders or the use of chemicals.

PRINCIPLES OF FINGERPRINTS

- First Principle: A fingerprint is an individual characteristic; no two fingers have yet been found to possess identical ridge characteristics
- Second Principle: A fingerprint will remain unchanged during an individual's lifetime
- Third Principle: Fingerprints have general ridge patterns that permit them to be systematically classified

Skill 2: CHARACTERISTICS OF FINGERPRINTS

There are 3 general fingerprint distinctions:



About 5% of the population

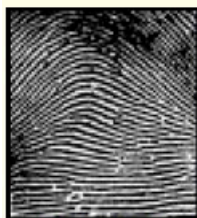
About 30% of the population

About 65% of the population

Basic patterns can be further divided:

- Arch patterns can be plain (4%) or tented (1%).
- Loop patterns can be radial or ulnar
- Whorl patterns can be central pocket (2%), double loop (4%), or accidental (0.01%).

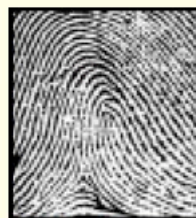
Even twins have unique fingerprints due to small differences (called _____) in the ridge patterns.



Plain Arch



Tented Arch



Ulnar Loop



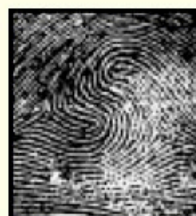
Radial Loop



Plain Whorl



**Central Pocket
Loop**



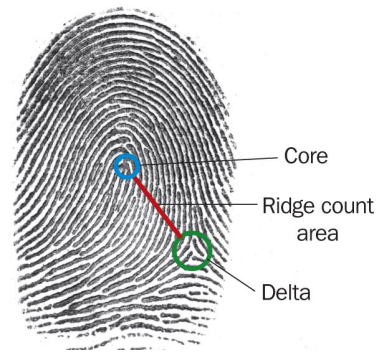
**Double Loop
Whorl**



**Accidental
Whorl**

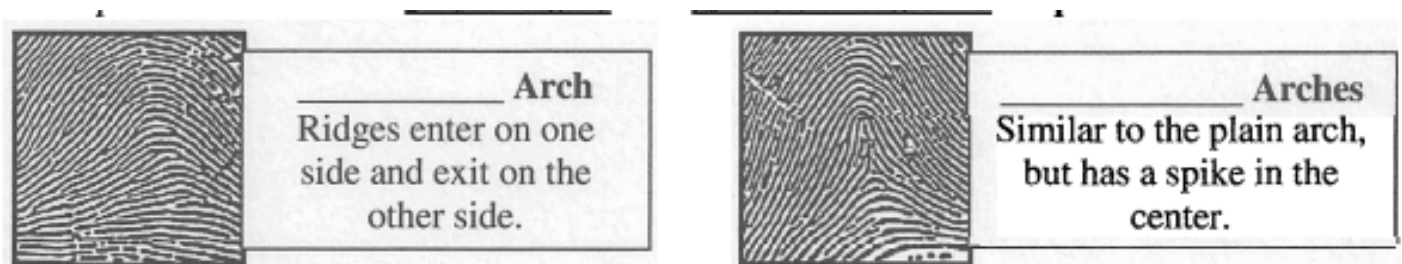
Forensic Examiners look for:

- Core (the center of a whorl or loop)
- Delta (triangular regions near a loop)
- Ridge Count
 - o Counting from the core to the edge of the delta
 - o Distinguishes one fingerprint from another



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.



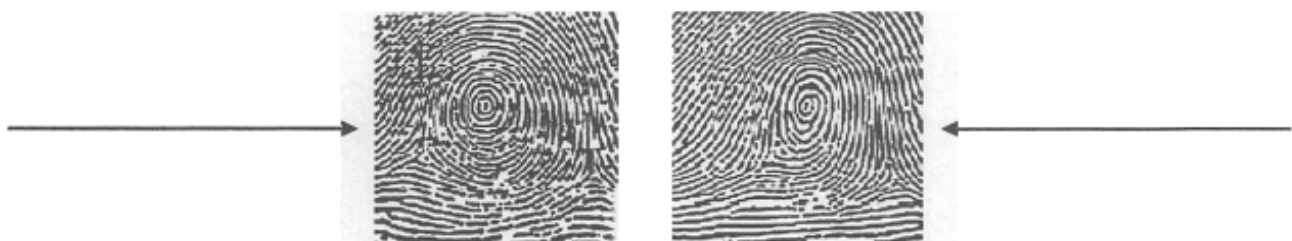
Loops:

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.



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.



There are at least 150 individual ridge characteristics on the average fingerprint. If between _____ to _____ specific points of reference for any two corresponding fingerprints identically compare, a match is assumed.