Unit 4: Fingerprints

Unit Vocabulary

- Fingerprint: ________________________________________________________________
- Microns: _________________________________________________________________
- Dactyloscopy: ____________________________________________________________
- Anthropometry: __________________________________________________________
- Loop: ___________________________________________________________________
- Delta: __________________________________________________________________
- Core: ___________________________________________________________________
- Whorl: __________________________________________________________________
- Arch: ___________________________________________________________________
- Minutiae: _________________________________________________________________
- Plastic print: _____________________________________________________________
- Visible print: _____________________________________________________________
- Latent print: _____________________________________________________________
- Ninhydrin: ______________________________________________________________
Fingerprint Principles
- According to criminal investigators, fingerprints follow 3 fundamental principles:
  - A fingerprint is an ______________________characteristic; no two people have been found with the _______________ same fingerprint pattern.
  - A fingerprint ______________________ will remain ______________________ for the _______________ of an individual; however, the print itself may change due to permanent scars and skin diseases.
  - Fingerprints have general characteristic _______________ patterns that allow them to be systematically identified.

Fingerprint Classes
- There are 3 specific classes for all fingerprints based upon their visual pattern:
  - Each group is divided into smaller groups as seen in the lists below.
    - Plain arch
    - Tented arch
    - Radial loop
    - Ulnar loop
    - Plain whorl
    - Central pocket whorl
    - Double loop whorl
    - Accidental

Fingerprint Fun Fact
- _________ of people have loops, _________ have whorls, and _________ have arches
- ________________ is the study of fingerprint identification. Police investigators are experts in collecting ________________, otherwise known as fingerprints

Arches
- Arches are the ______________________ 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
  - Ridges enter on one side and exit on the other side
  - Similar to the plain arch, but has a spike in the center
Loops
- Loops must have one delta and one or more ridges that center and leave on the same side. These patterns are named for their portions related to the radius and ulna bones.
  - (Right thumb)
    - Loop opens toward right or the ulna bone
  - Radial Loops (Right thumb)
    - Loop opens forward toward the left or the radial bone

NOTE: On the left hand, a loop that opens to the left would be an ulnar loop, while one that opens to the right would be a 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.
  - 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 central core touches the line, it is a central pocket whorl.
  - Double loop whorls are made up of any two loops combined into one print
  - Accidental whorls contain two or more patterns (not including the plain arch), or does not clearly fall under any of the other categories
My Prints
Using the supplies given, create your own fingerprints. Be sure to specify whether your prints are from your left hand or your right hand.

<table>
<thead>
<tr>
<th>R/L Thumb</th>
<th>R/L Pointer</th>
<th>R/L Middle</th>
<th>R/L Ring</th>
<th>R/L Pinky</th>
</tr>
</thead>
</table>

Ridgeology – A Closer Look at Fingerprints

- Ridgeology: the study of the characteristics of friction ridge structures and their use for personal identification.
- A fingerprint is made of a series of patterns on the surface of the finger. The uniqueness of a fingerprint can be determined by the pattern of ridges and valleys as well as the minutiae points, which are points where the ridge structure changes.

Fingerprint Fun Fact
- The koala is one of the few mammals (other than primates) that have fingerprints. In fact, koala fingerprints are remarkably similar to human fingerprints; even with an electron microscope, it can be quite difficult to distinguish between the two.

Fingerprint Identification
- When ___________ on two different prints match, these are called points of ___________ or points of ___________. At this point, there is ______ international standard for the number of points of identification required for a match between two fingerprints. However, the United Kingdom requires a minimum ________ points while Australia requires ________.

Automated Fingerprint Identification System (AFIS)
- AFIS is a __________ system capable of reading, classifying, matching, and storing fingerprints for criminal justice agencies. __________ latent fingerprints are entered into the AFIS for a search for possible matches against the __________ maintained databases for fingerprint records to help establish the ____________ of unknown deceased persons or suspects in a criminal case.

Unit 4: Fingerprints - Notes
Ridge Characteristics

Use these characteristics as points of identification when comparing fingerprint samples. The more points you can find in common, the better the match!
Latent Prints

_________________________ are impressions left by ____________________________
on a surface, such as a tool handle, glass, door, etc.
Prints may be collected by revealing them with a dusting of ____________________________
and then lifted with a piece of ________________________________
Some investigators use ____________________________ powder and ____________________________
to help them find latent prints on ________________________________
___________________________ can also be used to reveal latent prints. This type of powder works better on shy surfaces or ______________
The ________________________________ fuming method (often called the ____________________________
method) is a procedure that is used to develop latent fingerprints on a variety of objects.
___________________________ is a chemical that bonds with the ____________________________
in fingerprints and will produce a blue or purple color. It is used to lift prints from surfaces such as ___

Fingerprint Fun Fact

Camel hair is the most common animal hair used to make fingerprint brushes. Now many brushed, are made out of fiberglass