

Lab 8: Fingerprinting

Introduction:

The fingerprint is still one of the most important and useful pieces of forensic evidence. No two persons' fingerprints are alike, not even identical twins. This uniqueness allows fingerprints to continue to be strong evidence for identification of individuals at crime scenes. It is often used in conjunction with other evidence, such as DNA fingerprinting which is more sophisticated and accurate than traditional fingerprinting.

Report:

You are hired as an independent investigator to match a fingerprint that was lifted from a crime scene to a list of known suspects. In your report, make sure that you:

1. Clearly state which suspect fingerprint matches the crime scene fingerprint.
2. Defend your choice, using information you learned from Part One.
3. Explain how the crime scene fingerprint could have been obtained based on what you learned in Part Four.

Procedure:

Part One: Fingerprinting Background

1. Read and study the *Fingerprint Background Information*.
2. Discuss any questions you may have with your classmates.
3. Obtain a *Suspect Fingerprint Card Set* and *Primary Classification Worksheet*.
4. Use the *Primary Classification Worksheet* to record your classification of each fingerprint from A through R. Classify each print as loop, whorl, or arch. Refer to your *Fingerprint Background Information* for help.
5. Compare your classifications with others and discuss any discrepancies.

Part Two: Matching Fingerprints

1. Obtain a *Crime Scene Fingerprint* from the instructor.
2. Use your knowledge of fingerprint patterns and determine if there is a match with any of the known suspects from your card set. Find at least one individual ridge characteristic that clearly matches the suspect to the *Crime Scene Fingerprint*.
3. Record your findings on the *Primary Classification Worksheet*. Which fingerprint from samples A through R matches the *Crime Scene Fingerprint*? Defend your choice.
Important: Be sure to record your *Crime Scene Fingerprint* number.

Part Three: Inked Fingerprints

1. Making good, clear inked fingerprints requires practice and deliberate work. Pressing too hard or using too much ink may smear the fingerprint. Practice on scratch paper before making your actual print record.
2. Obtain an ink pad, a *Fingerprint Record Sheet*, and some scratch paper.
3. Starting on the left side of your right index finger, gently and uniformly roll your finger to the right side of the ink pad.
4. On scratch paper, place the left side of your inked finger down.
5. Grasp this finger with your left thumb and forefinger and gently roll to the right side while maintaining uniform pressure to the finger to avoid smearing.

6. Repeat this procedure for your right hand fingers until your print is of acceptable quality for fingerprinting on the *Fingerprint Record Sheet*.
7. Fingerprint the fingers on your right hand on the *Fingerprint Record Sheet*. You have two copies on one sheet in case you want to redo any of the fingerprints on your right hand.
8. Repeat the same procedure for the fingers on your left hand with a rolling motion from left to right. Use your right thumb and forefinger to guide each finger during the process. Remember to maintain uniform pressure to the fingers to avoid smearing. You have two copies on one sheet in case you want to redo any of the fingerprints on your left hand.
9. Set the *Fingerprint Record Sheet* aside to let the ink dry completely.
10. Wash your hands thoroughly with soap and water.
11. Refer to the *Fingerprint Background Information* and do a preliminary FBI number classification for your personal fingerprints. Record your results on the *Primary Classification Worksheet*.
12. Make sure you answer questions 1 and 2 under Activity 3 of the *Primary Classification Worksheet*.

Part Four: Latent Fingerprints

(*Hint: In this part, if there is any difficulty in getting enough oil on your finger for a latent print, run your fingers through your hair or on your scalp several times.*)

A. Non-porous Surfaces

1. Obtain some black powder (charcoal) and a “feather” pen.
2. Obtain a clean glass slide and gently press your thumb down on the middle of the slide to leave your thumbprint.
3. Use the “feather” pen to gently “float” some powder onto the latent print area. Be sure to add the powder *very* slowly until you can see the print clearly. You only need a little bit of powder! Do not add so much powder that you fill in the space between the ridges.
4. Gently dust the print until it becomes visible. Once the print is visible, gently brush in the direction of the friction ridges to avoid smearing. Record your observations (taking a picture might be helpful).
5. Obtain about 3 inches of lifting tape (Scotch tape). Adhere the tape to the base of the print (edge of slide). Holding the tape taut and beginning at the base of the print, gently begin pressing down the tape as it moves upwards and beyond the print. Try to avoid air bubbles and smearing.
6. Gently pull back the tape, lift the print, and place the print on a piece of contrasting white paper for your records.
7. Repeat the above lifting procedure to lift a latent print from a smooth, metal object (the paper towel holder works great). Use the same finger that you used in #2. Tape the lifted printed to a piece of white paper for your records.
8. After lifting all prints, **wash** the areas used, as well as your hands, with soap and water.
9. Were there differences between the prints you lifted from the glass and metal? Why or why not?

B. Porous Surfaces

Softer, more porous surfaces are more difficult from which to lift a “good” fingerprint. There are numerous chemical tests for the substances left behind in a fingerprint and forensics experts are continually trying to develop new techniques for “lifting” fingerprints chemically.

The dusting process used in Part A cannot be used to develop a print on paper, because the water from the perspiration spreads out and the print appears smeared. Exposing the print to iodine crystals will develop the print. The oily material on the print absorbs the iodine vapor and produces a violet to purple brown fingerprint.

1. Obtain a white piece of paper and gently press your thumb or finger down on the edge of the paper (the oilier your finger is the better). Make a note on the paper where you put your fingerprint.
2. Wear plastic gloves to carry out steps 3-9.
3. Obtain an iodine chamber (glass jar with iodine crystals in it). Keep the lid on the chamber until you are ready to use it.
4. Cut your white paper containing your fingerprint into a rectangle so that it will fit into your iodine chamber.
5. Under the hood, place the paper into the chamber and make sure the lid is on the jar.
6. The iodine crystals will sublime into a gas.
7. Once your fingerprint is visible (about 3 minutes or less), carefully take your paper out of the chamber (again under hood). Replace the lid immediately.
8. Observe your fingerprint under the magnifying glass. Record all observations (taking a picture might be helpful).
9. The developed print may disappear since the iodine will continue to sublime off of your print. To “save” the print, completely immerse the paper into a calcium chloride/potassium bromide solution using the tweezers. This will “fix” the print for a few weeks. Allow the paper to dry and then place in a Ziploc bag.