

# Finger Print Lab

## Preparation of the "Evidence"

**NOTE:** Since it is important that only *one* fingerprint be placed on the material to be analyzed, students should use gloves to transfer the evidence from one place to another.

### Exhibit A

1. Wash a beaker or glass and rinse it with distilled water. Wipe it dry, making sure no finger prints appear on the glass surface.
2. Hold the glass or beaker in a paper towel or cloth and place three distinct RIGHT thumb prints on the surface of the glass. If the print is smudged, is not clear, or is barely visible, wipe off the glass and try again. This time, rub your thumb over the oily portion of your face, blot the thumb, and then place a good print on the glass.
3. Label glass with "Exhibit A" and your student I.D. number.

### Exhibit B & C

1. Using a pencil, label a piece of filter paper with "Exhibit B" (or "Exhibit C") and your student I.D. number at the top of the paper.

Ex:

Exhibit B	12754

2. Place a good, RIGHT thumb print in the middle of the paper.

### Exhibit D

1. Using a pencil, label a piece of bond paper with "Exhibit D" and your student I.D. number at the top of the paper.
2. Place a good, RIGHT thumb print in the middle of the paper.

### Exhibit E

1. Using a pencil, label a piece of bond paper with "Exhibit E" and your student I.D. number at the top of the paper.

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2. Ink your finger and place a good, RIGHT thumb print in the middle of the paper.

## Procedure A. Dusting For and Lifting Prints from a Smooth, Non-Porous Surface

Dust adheres to the sweat and oil on the print.

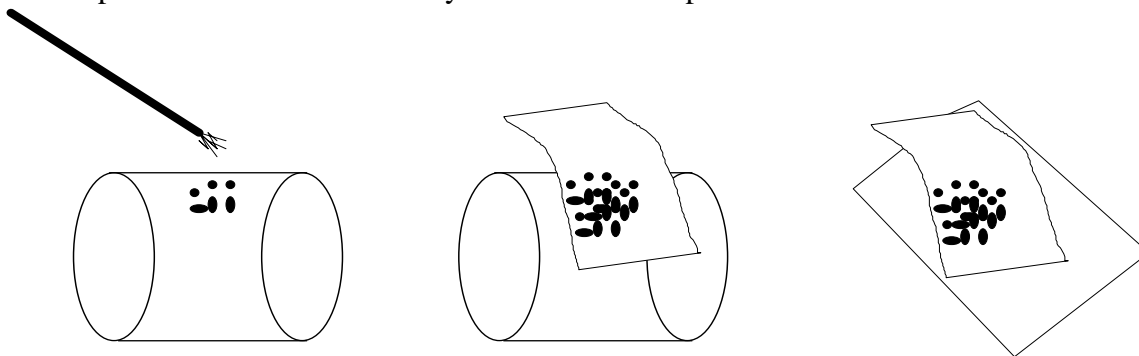
### Materials needed

Exhibit A	Dusting Brush	Newspaper
Dusting Powders (aluminum and carbon black)		Cellophane Tape
Index Card	Magnifying Glass	MO Sheets

### Procedure

**CAUTION: Metallic dust can be harmful to the lungs if inhaled!**

1. Dip the brushes in the powder and lightly dust the area of Exhibit A containing the print.
2. Distribute the powder evenly over the surface that contains the print. If possible pick up the object that carries the print and tap the edge of the object to uniformly distribute the dusting powder.
3. After all of the print is developed, remove the excess powder by blowing the dust from the surface or by gently brushing it away. Blowing the dust off the surface usually works better than using the brushes supplied in this kit. When blowing dust off, be careful not to inhale any of the dust between attempts. During the use of a brush to remove excess powder, be careful not to destroy the print with too hard a brush stroke.
4. To lift the print from the beaker to the index card, use about 5" to 6" of tape and place the end to the right of the thumb print on the beaker and allow the tape to cover the whole print. Slide a thumb over the tape and smooth it down over the print to force out all air bubbles.
5. The print can be removed by pulling up on the roll end of the tape and then placing it on the fingerprint card in the same manner as the tape was placed over the latent print. Make sure the tape is secure.
6. Observe the print under the magnifying glass and compare it to the right thumb prints on the MO's. Identify the owner of the print and record.



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## Procedure B. Using Ninhydrin to Develop a Print on Paper

Ninhydrin reacts with the amino acids in the perspiration on the print to form a pink or purple compound.

### Materials needed

Exhibit B  
Plastic Gloves

Magnifying Glass  
Brush or Cotton Swabs

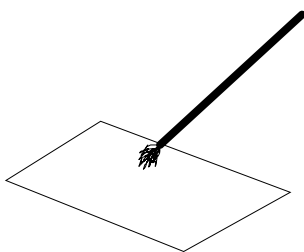
Ninhydrin Soln

### Procedure

**CAUTION: Ninhydrin soln is volatile and flammable. Keep this solution away from open flames.**

*NOTE:* Wear plastic gloves when working with the ninhydrin soln as it will react with the amino acids on your hands and turn them blue!

1. Tape the top of Exhibit B to a paper towel.
2. Dip the tip of the brush into the ninhydrin solution and carefully dab this liquid over the fingerprint area. Do not use too much pressure since that will destroy the print.
3. Allow the paper to dry. It may take 24 hours to develop. Observe the print under the magnifying glass and determine the identify of the person who left the print. Record the data.



*NOTE:* If the print does not develop, expose the paper to the fumes from ammonia, i.e. by opening a bottle of concentrated ammonia in the fume hood and holding the paper with the print over the opening of the bottle.

## C. Using Silver Nitrate Soln to Develop a Print on Paper

Silver Nitrate reacts with the salt in the perspiration on the print to form silver chloride.

### Materials needed

Exhibit C  
Plastic Gloves

Magnifying Glass

Silver Nitrate Soln

### Procedure

**CAUTION: Exposure to silver nitrate soln will turn skin black.**

*NOTE:* Wear plastic gloves when working with the ninhydrin soln as it will react with the amino acids on your hands and turn them blue!

1. Hold the undeveloped print in front of and over a tray. Spray the print with silver nitrate soln. The print should be soaked, but not runny.
2. Place the wet print under the U-V light until the print develops. Observe the print under the magnifying glass and determine the identify of the person who left the print. Record the data.

## D. Using Iodine Crystals to Develop a Print on Paper

The dusting process used in Part A cannot be used to develop a print on porous 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.

### Materials needed

Exhibit D  
MO sheets

Iodine Crystals  
Roll of Cellophane Tape

Screw-top Jar  
Plastic Gloves

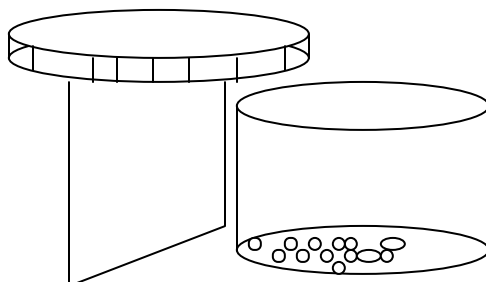
### Procedure

1. Cut a piece of tape about 1" long and place half of it on top of Exhibit D. Open the jar containing the iodine crystals and quickly tape the paper to the lid so that the paper hangs down in the jar. Replace the lid and allow the print to come in contact with the iodine vapor for about 3 to 5 minutes or until the print is visible.
2. Once the print is developed, remove the paper from the jar. Be sure to quickly replace the lid on the jar.
3. Observe the print under the magnifying glass. Determine the identity of the person who left the print and record the data.
4. The developed print may disappear since the iodine will continue to sublime. To

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"save" the print, completely enclose the paper in plastic tape.  
(This could also be accomplished by completely immersing the paper in a solution containing 12.5 grams of calcium chloride and 43.9 grams of potassium bromide in 100 ml of water. This will "fix" the print for a few weeks.)



### **E. Identifying a Direct Print**

Occasionally a criminal will leave behind a print that is clearly visible. Prints like these can be made by colored material that was on the person's fingers. Substances that leave usable direct prints include soot, inks, blood, paints, facial make-up, and dyes. Usable direct prints can also be left on materials like window putty or clay that are soft enough to take the impression of the print but firm enough to retain the image after the impression is made.

#### **Materials needed**

Exhibit E

Magnifying Glass

MO Sheets

#### **Procedure**

1. Use a magnifying glass to observe the inked print on Exhibit E. Compare this print to one on the MO sheets.
2. Determine the identity of the print and record the data.