



**National Law  
Enforcement  
Museum**

at the **Motorola Solutions**  
Foundation Building

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# **Fingerprints & Impressions**

# Who Stole John's Painting?

John- Victim &  
Museum  
Director



**Nicole- Girlfriend**



**Mark- Co-worker**



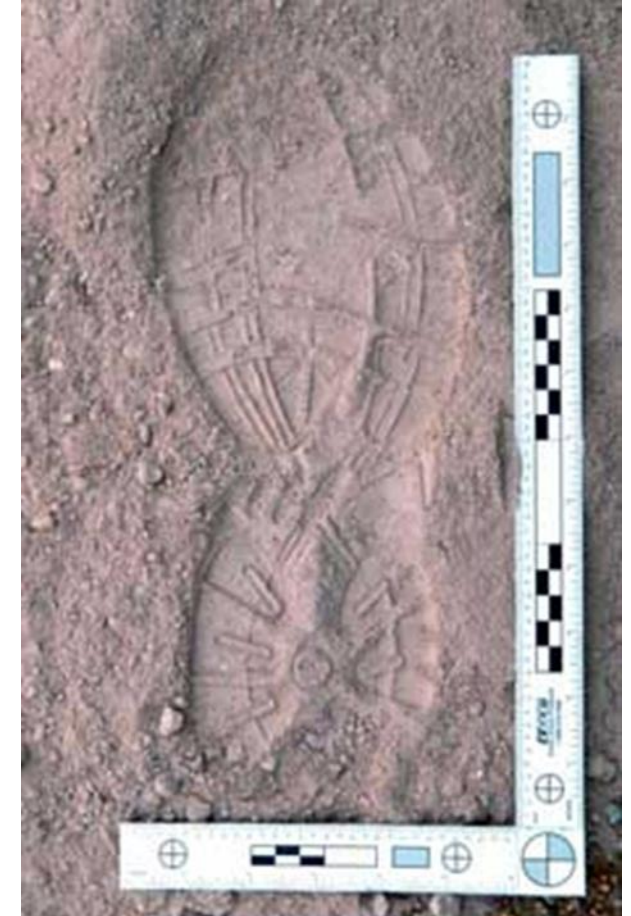
**Greg- Best Friend**

# The Evidence



Fingerprint Found on  
Frame

Toolmark Impression on  
Wall



Shoeprint Found in Yard

# Your Task

- 3 suspects have been identified by law enforcement and have provided their shoe prints and finger prints
- 3 tools were found in the home
- Your job now is to analyze the evidence, compare them to the known standards, and evaluate them for any matches. Hopefully, based on your examinations you will be able to identify the prime suspect in the case.

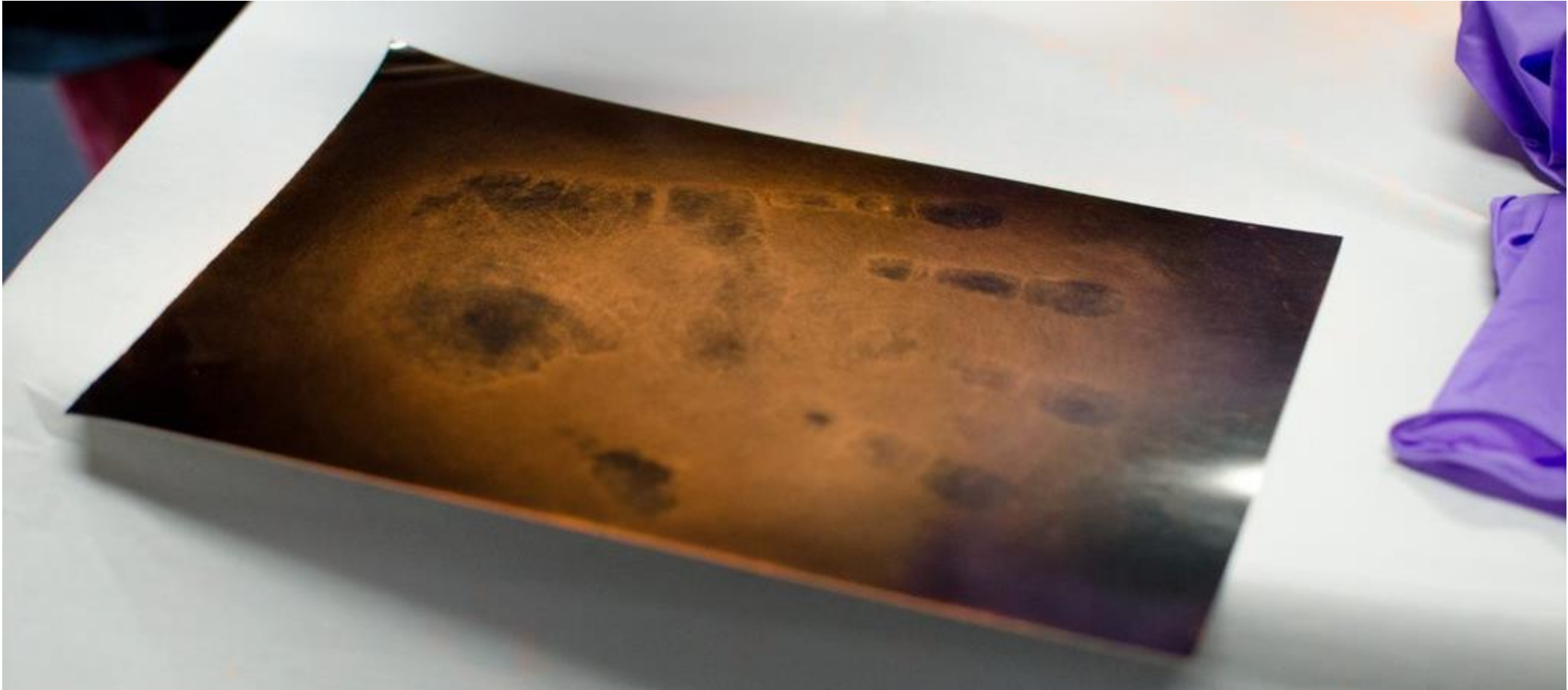
# Activity #1: 2D or 3D

# Casting the Shoe Impression





# Fingerprint Evidence



# Activity #2: True or False

1. Identical twins share the same fingerprints
2. Your fingerprints grow with you, but they don't change.
3. You have the same fingerprints on each finger
4. Your fingerprints are unique to you
5. Your fingerprints are formed while you are in the womb
6. Fingerprints were used by the Ancient Egyptians to sign contracts



# Activity #2: Answers

1. FALSE
2. TRUE
3. FALSE
4. TRUE
5. TRUE
6. FALSE

# Types of Fingerprints



Plastic



Latent



Patent/Visible

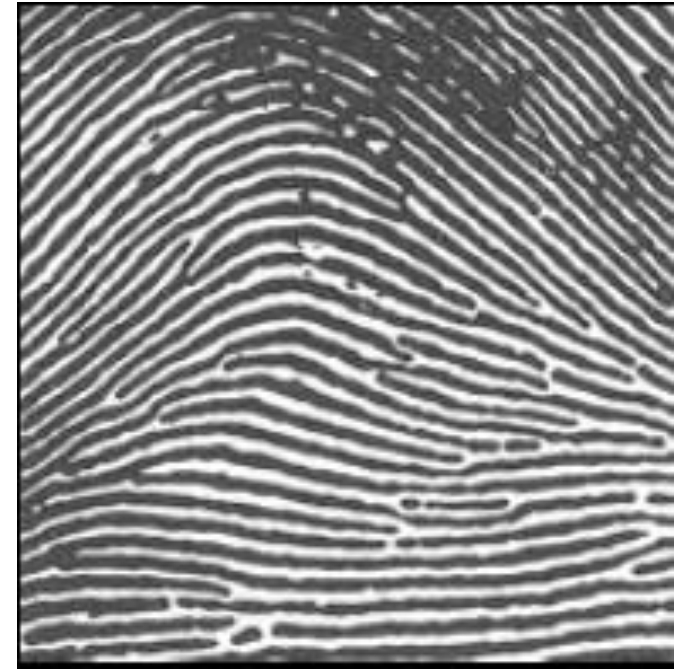
# Basic Fingerprint Patterns



Loop



Whorl



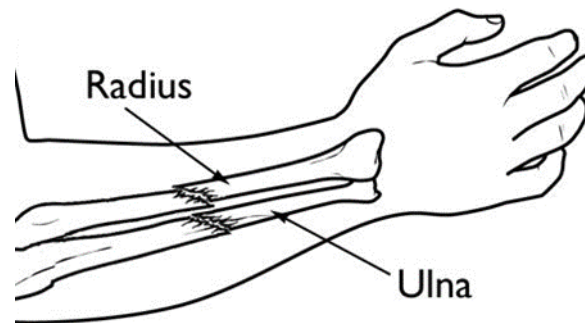
Arch



# Loop Variations

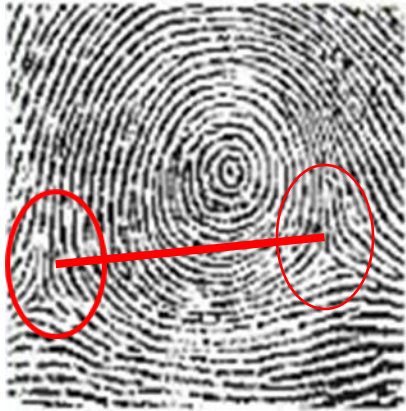


**Radial loop:** enters and exits on the side of the Radius (on a Right hand)



**Ulnar loop:** enters and exits on the side of the Ulna (on a Right hand)

# Whorl Variations



**Plain Whorl**

**Plain whorl:** Contains two deltas and at least one circular ridge which can be a spiral, an oval, or any type of circle. When an imaginary line is drawn between the two deltas the line must touch or cross at least one of the curving ridges that form the whorl.



**Central Pocket  
Loop Whorl**

**Central Pocket loop whorl:** Contains two deltas, one or more recurving ridges. When an imaginary line is drawn between the two deltas no recurving ridge within the inner pattern that forms the whorl is touched or cut.

# Whorl Variations



**Double Loop  
Whorl**

**Double loop whorl:** Consists of two separate loop formations with two separate distinct sets of shoulders (loops) and two deltas. The shoulders of each "core" must comprise separate lines to be considered “separate and distinct.”



**Accidental  
Whorl**

**Accidental whorl:** Consists of a combination of two different patterns (with the exception of the plain arch) with two or more deltas. This classification also includes unusual patterns which cannot be placed into any other category. Any pattern with more than one delta is automatically put into this category.



# Arch Variations



**Plain arch:** The ridges enter upon one side, make a rise or a wave in the center, and flow out the opposite side.



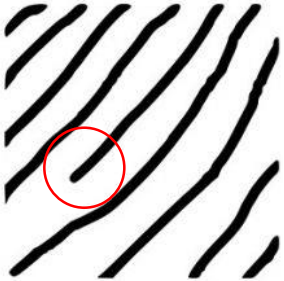
**Tented arch:** The ridges formed in the center form a definite angle OR have two of the three basic characteristics of a loop pattern.



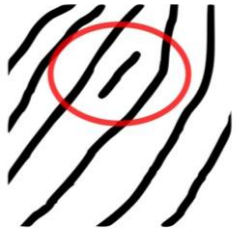
# Activity #3: Name The Fingerprint Pattern

# Activity #3: Answers

# Ridge Characteristics



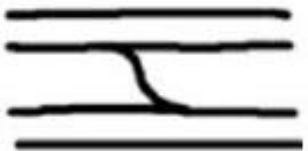
1. Ridge Ending: A single friction ridge that terminates within the friction ridge structure.



2. Short Ridge: A single friction ridge beginning, traveling a short distance, and ending.



3. Bifurcation: The point at which one friction ridge divides into two friction ridges.



4. Bridge: A connecting friction ridge between and at generally right angles to parallel running ridges.

# Ridge Characteristics



Find each feature:

- Short Ridge
- Ridge Ending
- Bridge
- Bifurcation

# Lifting a Fingerprint



# Tool mark Impressions





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