

Forensic Footwear Activities

Footprint Impressions

A footprint, or footmark, is an indentation or an outline left on a surface by a foot. Similarly to footwear impressions, a footprint can be of value in the Forensic process.



Source: <http://www.healthwealth.com/wp-content/uploads/2013/12/517.jpg>

Task 1

What you will need: Flour and a camera, a clean tray if you wish.

1. Sprinkle the flour evenly on a flat surface, for ease of cleaning this can be done in a tray on the floor.
2. Step in the flour with your bare feet, then step on the floor (or a clean tray).
3. This should leave an impression in the flour tray where the flour has been removed by your foot and an impression where the flour has been deposited on the clean floor/tray.
4. Take a photograph on both impression that you have made, using a scale or ruler.
5. Use a rectangle of sticky back plastic, cut to size. Carefully lay the plastic sheet over the 2nd impression on the floor (or clean tray) sticky side down and gently smooth down.
6. Carefully lift the sticky back plastic and place sticky side down onto a dark piece of paper or a clear acetate.
7. Look carefully at the impression and photographs. What can you see?

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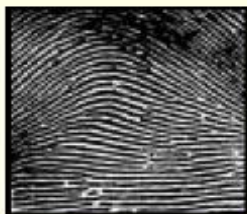
Friction ridges on the soles of the feet were formed during the development of a foetus in the womb. This causes the details of each person's footprints to be unique. Therefore, the value of footprints are on par with those of fingerprints found at crime scenes.

Task 2

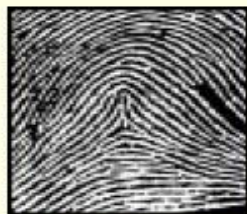
1. Let a friend or family member repeat steps 1-4 from **task 1** above.
2. Compare the details of your footprints to the other person's!
3. Note your conclusions in the table provided below.

Examples of what to look compare.

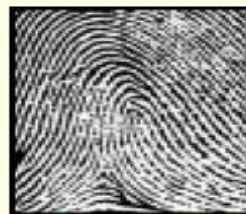
- Shape of foot.
- Length.
- Compare each toe print separately.
- Specific ridge patterns called loops, whorls and arches.



Plain Arch



Tented Arch



Ulnar Loop



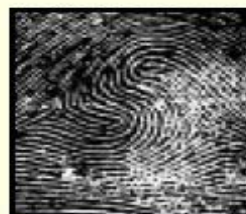
Radial Loop



Plain Whorl



**Central Pocket
Loop**



**Double Loop
Whorl**



**Accidental
Whorl**

Source: <http://www.viewzone.com/fingerprint1.jpg>

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Fun Fact: Cases sometimes occur in which burglars lacking gloves for their hands have taken off their socks and put them on their hands to avoid leaving fingerprints. The thought of leaving footprints never entered their minds!

	Person A	Person B
Difference 1		
Difference 2		
Difference 3		
Difference 4		

Biometrics

Height estimation by measurement of various long bones have been attempted with varying degrees of success. However, there has not been extensive study into the relationship between foot length and height.

Task 3: Calculate the height of family and friends using their foot length.

1. Use a ruler to measure the length of the person's left foot. Measure from the heel to the tip of the second toe. Note this measurement in centimetres (cm).
2. Use a tape measure and estimate the person's standing height.
3. Repeat steps 1 and 2 above for as many people as possible.
4. Using the following mathematical equation calculate the height of your subject.

$$\text{Male- } Y = 75.45 + 3.64X$$

$$\text{Female- } Y = 75.41 + 3.43X$$

Y- Calculated height; X- Foot length

E.g. Daisy.

$$Y = 75.41 + (3.43 * 22)$$

$$Y = 150.87 \text{ cm}$$

5. Determine how close the actual height of the person is to the calculated height.
Difference between actual height and calculated = $155 - 150.87 = 4.13 \text{ cm}$

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Name	Foot length (cm)	Actual Height (cm)	Calculated height (cm)	Difference between Actual and Calculated height (cm)
Daisy	22	155	150.87	4.13