Crime Scene Investigation

Impression Evidence

What is impression evidence?

Impression evidence can be defined as **objects** or **materials** that have retained the characteristics of other objects through direct **contact**.

Impressions are created when one object is pressed against another material with enough **force** to leave an impression of the object.

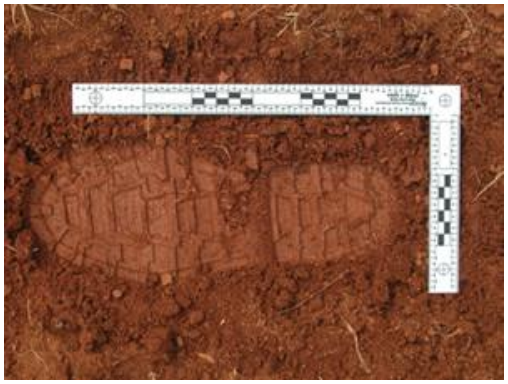
Shoeprints, tool marks, tire tracks, **bite marks**, and **marks** on a **fired bullet** are several examples of impression evidence.

Impressions may be found in or on many different types of **materials**. The **quality** of the impression depends on the object making the impression and the surface conditions, such as how hard or soft it is and what type of material it is (soil, mud, dust, concrete, grass, skin, etc.)

CSI & Impressions

Images: http://upload.wikimedia.org/wikipedia/commons/archive/6/61/20070917141644!Shoeprint(forensic).jpg and http://www.topmark.co.nz/images/content/tmpics01/gallery-s/SilipressionTeethMold.jpg

Collection Methods



Investigators analyze the impression evidence to find unique **characteristics** to link shoes, tires, tools, and other objects found in a suspect's possession to evidence at a crime scene.

Collection of impression evidence can be accomplished using several methods:

2-D: This type of impression is documented using **photography**. Some impressions may be dusted with fingerprint **powder** to be photographed or lifted with **tape**. They may also be collected using an **electrostatic** dust lifting process.

3-D: This type of impression can be documented using **photography** as well as by **casting**, which involves using dental stone or a similar substance to preserve the dimensional characteristics of the print.

Example of Shoe Print in
Bio-Foam Impression Foam

Images: http://www.evidentcrimescene.com/cata/cast/dscasting.html

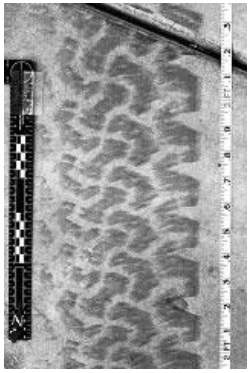
Tire Track Evidence

Tire tracks are important in forensic investigations and are usually found in road **accident** scenes or in the access and **escape** routes of other crime scenes. Tracks help investigators identify the type of **vehicle** that left them. Investigators may make **ink prints** of a tire or **plaster casts** of a track. They will also take **photographs** that can later be used to prove a match.

<u>Features to analyze</u>:

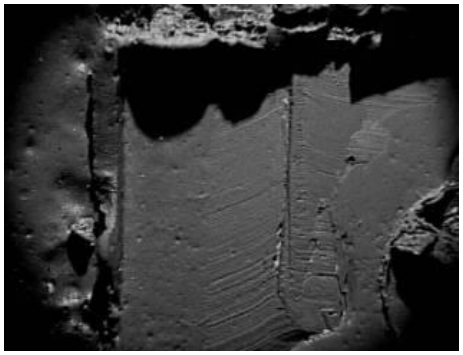
- **Tread** pattern
- **Width** & **depth** of the tread pattern
- Unique characteristics due to the **wear pattern** or **defects**

Tire databases are available help investigators determine the brand and model of the tire that left the impression , which can be used to determine the type of **vehicle** that made the tracks.



Images: http://www.suite101.com/view_image.cfm/454216, http://www.ronsmithandassociates.com/FWTTS.htm.

Tool Mark Evidence



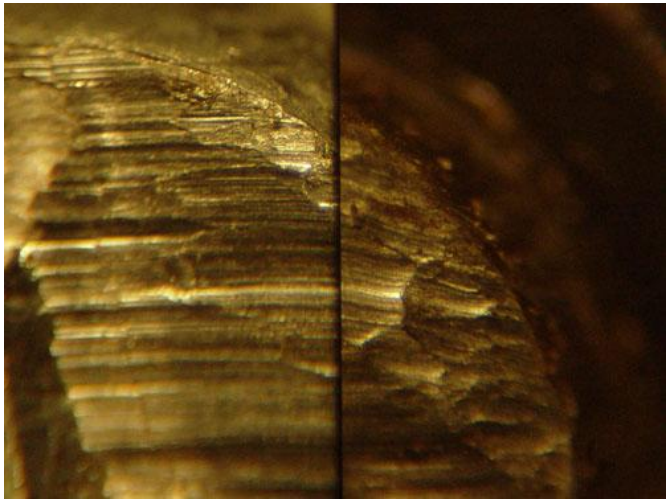
Certain **defects** or **patterns** may be left on a tool when it is made or used, which can be used to find matches between evidence at a crime scene and tools or objects found at a suspect's home.

Tool marks can be classified two ways:

(1) Impressions – As a tool hits a softer surface, the shape of the tool and imperfections in its surface may be left behind as an impression.

(2) Scratches – As a tool moves across a surface, it may leave ridges or striations behind.

NOTE: Some tool marks are a combination of both types.



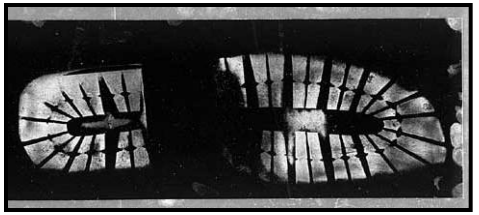
<u>Features to analyze:</u>

- **Dimensions** of the impression
- Ridges or striation **patterns**
- **Defects**, such as nicks and chips
- **Paint** chips or **metal** shards left on a tool

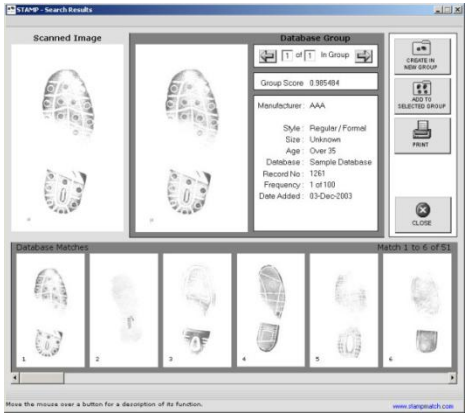
Images: http://geradts.com/html/Documents/structured_files/image004.jpg and http://www.maine.gov/dps/msp/criminal_investigation/crimelab/images/toolmarks1.jpg

Shoe Print Evidence

Investigators can analyze a shoe print to determine its **class**, or the type and brand of shoe. They will also look for **individual** characteristics, such as **wear patterns** and specific **damages** or **defects**.



Databases of shoe prints are available for investigators to help them determine the **brand** of shoe to provide leads for a case.



STAMP Database

Depending on the quality of the impression, investigators may be able to determine a person's **speed** (walking vs. running) as well as estimate the **size** of a person based on the impression's depth.

<u>Features to analyze:</u>

- **Tread** patterns, size, and depth
- **Wear** patterns caused by the way a person walks
- Material defects or **damage** (nicks, cuts, etc.)
- Other **trace** materials, such as soil, tar, rocks, and paint that would indicate where a person has been

Shoe Print in Bio-Foam Impression Foam

Images: http://www.stampmatch.com/results.html and http://www.fosterfreeman.com/products/shoeprints/solemate/solemate.html

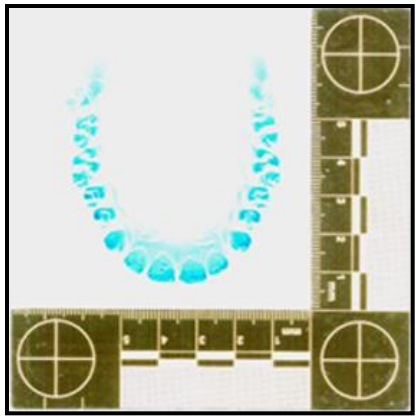
Bite Mark Evidence- Forensic Odontology

Investigators can analyze **bite marks** for characteristics to help them identify victims or suspects as well as to exclude others. Marks can be left on a victim's **skin** or other **objects**, such as Styrofoam cups, gum, or foods. **Saliva** or **blood** may be left behind that can be tested for **DNA**. Dental records including **x-rays** can also provide useful information, especially when attempting to identify a victim.

Bite Mark Evidence Video

Features to analyze:

- **Type** of bite mark (human or animal)
- Characteristics of the **teeth** (position, evidence of dental work, wear patterns, etc.)
- **Color** of area to estimate how long ago the bite occurred (old or recent bite)
- Swab for **body fluids** for DNA tests



Did you know?

The most famous incident where bite mark evidence led to a conviction, was in the case of the notorious serial killer, Ted Bundy. He was responsible for an undetermined number of murders between 1973 and 1978 and was finally tied to the murder of Lisa Levy through bites that he had inflicted on her body.

Images: http://www.forensicdentistryonline.org/Forensic_pages_1/currentopic1.htm, http://www.trestonedental.co.uk/images/0303.jpg

It's time to investigate some "impressive" evidence!

Image: http://www.sxc.hu/photo/442696