

# POWER OF

# EVIDENCE

## TYPES OF EVIDENCE

**TESTIMONIAL:** Eyewitness accounts of a crime.

**PHYSICAL EVIDENCE:** Any material items that are present at the crime scene or on the victims.

**TRACE EVIDENCE:** Physical evidence that is found at a crime scene in small but measurable amounts.

## EVERY CONTACT LEAVES A TRACE

The value of trace (or contact) forensic evidence was first recognized by Edmund Locard in 1910. He was the director of the very first crime laboratory in existence, located in Lyon, France. The **Locard's Exchange Principle** states that "with contact between two items, there will be an exchange."

## CRIME SCENE EVIDENCE



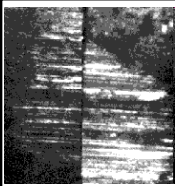
**PAINT** - Physical and chemical analysis of paint can indicate its class or what type of paint it is (auto, house, nail polish, etc.) Individual characteristics, such as the color, number of layers, chemical composition, or features of paint chips, can be analyzed and used for matching evidence to a suspect.



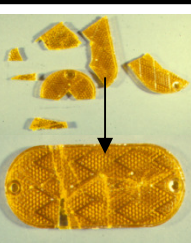
**GLASS** - Particles found at various crime scenes (breaking and entering, hit and run, vandalism, or murder) will be analyzed to determine its properties, such as color, tint, thickness, density, chemical composition, and refractive index (RI).



**EXPLOSIVES** - Examination can determine the chemical composition to identify the type of explosive used and its origin. Traces of explosives found on a suspect may be matched to explosives from the scene. Materials used to make an explosive device will be compared to evidence found in the suspect's possession.



**BALLISTICS** - Characteristics of ammunition, firearms, and residue are examined to find matches between suspects and evidence found at a crime scene. Chemical tests can reveal gunshot residue (GSR) on suspect. Rifling in a gun barrel causes distinctive marks on fired bullets. The National Integrated Ballistics Identification System (NIBIS) is a database used for ballistic evidence.



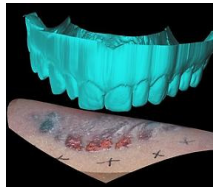
**FRACTURE MATCHES** - When an object is broken, torn, or cut, two unique edges are formed (fracture lines.) These can be compared to see if they fit together to show that may have been part of the same object at one time. Investigators compare the pieces of tape, glass fragments, paint chips, pieces from a car, etc. to find possible matches.

## IMPRESSION EVIDENCE

**Shoeprints & Tire Tracks:** Impression evidence can be photographed, lifted with tape, or cast with plaster. Investigators will examine the evidence to identify the brand of shoe or tire based on the tread pattern and other physical features. Shoes and tires will also show wear patterns after being used for a period of time as well as other features (scratches, nicks, and cuts) that can be used to match evidence to specific items.

**Bite Marks:** Each of the 32 teeth in humans is unique due to age and wear. Impressions and photographs of bite marks left on a victim, assailant, or other object at can be matched to dental records for the identification of a victim or suspect.

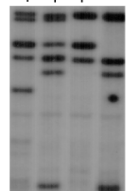
**Tool Marks:** Tiny nicks and chips form on the edges of a tool as it is used, which can be used to identify matches between evidence and suspects. Tools may also pick up traces of blood or other substances that can be tested or have fingerprints that can be lifted.



**BODY FLUIDS** - Blood, semen, saliva, sweat, and urine can be analyzed to provide information about the crime as well as its victim or the suspect. Chemicals and UV light can be used at a crime scene to find areas with body fluids, which are swabbed, bagged and collected in vials.



**DNA** can be extracted from almost any tissue-hair, fingernails, bones, teeth, & body fluids. A DNA profile is created and compared to those from suspects or victims. CODIS (Combined DNA Index System) is a FBI database that is used to find matches to unknown DNA samples from a crime scene.





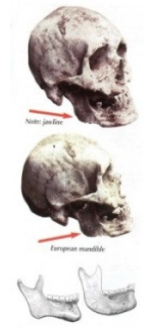
**FINGERPRINTS** - There are 3 types of patterns: arches, loops, and whorls. Unique ridge characteristics in a fingerprint are also used to identify a suspect or victim. AFIS (Automated Fingerprint Identification System) is a database used by investigators to find matches to fingerprints found at a crime scene.

**DUST & DIRT** - Dust, dirt, or sand evidence can reveal where a person has traveled and may be picked up at a crime scene or left behind. Investigators examine the samples for chemical composition, pollen, plants, and other organic matter to find links to a specific crime scene.



**HAIRS & FIBERS** - These may be transferred from a suspect to a victim and vice versa. Hairs can be examined to identify their origin, such as human or animal. Hairs with roots intact can be tested for DNA. Fibers are used to make clothing, carpeting, and furniture. They may be natural fibers (plants or animals) or synthetic (man-made).

**SKELETAL REMAINS** - These are analyzed to determine a victim's age, sex, race, and stature (height/build). Sex can be determined by examining the pelvis, humerus, and femur. Age and stature can be determined by analyzing the teeth, bone growth, and the length of specific bones (femur.) Race can be determined by analyzing the skull for specific characteristics. Remains may also provide clues as to the cause of death or the victim's life history. DNA may be extracted from bone, teeth, or hair.



**WOUNDS** - Wounds can often be matched to weapons or tool marks on the weapon. Investigators may also be able to determine the weapon's size, shape, and length. Wound analysis provides clues about a victim's injuries, the suspect (left-handed, right-handed, height, etc.), and the positions of the victim and suspect.

**QUESTIONED DOCUMENTS** - Examiners will analyze a ransom note or other document to find clues to link it to a crime scene or a suspect. The type of paper used, printing method or handwriting style, or type of ink will be analyzed. Unique features, such as watermarks or indentations on a paper, may provide useful clues.



**CRIME SCENE DO NOT CROSS**

What evidence would you collect from this crime scene? Circle the evidence you would collect and explain how you would use it in the investigation.

