



## Crime and Punishment in the U.S.

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*Forensics.* (Brand X)

## Forensics

**Definition:** Applications of science to the legal arena, particularly criminal investigations

**Criminal Justice Issues:** Evidence and forensics; investigation; technology

**Significance:** Forensic science and forensic medicine, as they relate to the processing of crime scene evidence, have become increasingly important to the resolution of cases within the criminal justice system, particularly as evolving technologies have allowed forensics to make ever greater contributions to criminal investigations.

Forensic science broadly encompasses the use of science in both criminal and civil courts. The types and variety of forensic evidence that can be presented in courtrooms are almost limitless. In criminal courts, forensic evidence is essential in drug cases. Forensic medicine is especially valuable in the handling of evidence relating to bodies in homicide and rape cases. In civil courts, forensic evidence is often presented in product-liability and injury cases.

### Forensic Specialties

The field of forensic science includes a variety of subdisciplines. These include forensic medicine, forensic anthropology, forensic entomology, forensic odontology, forensic palynology, forensic serology, and criminalistics. Forensic medicine is further divided into the areas of forensic pathology, forensic toxicology, forensic odontology, and forensic psychiatry.

Forensic pathology studies how and why people die and concentrates on sudden, unexpected, and violent deaths. During homicide investigations, forensic pathologists frequently perform autopsies. Forensic toxicology is concerned with chemicals--especially drugs and poisons--found in human bodies. During death investigations, forensic toxicologists may make determinations on whether victims have been killed

by poisons, such as lead. Toxicology analyses can also be used to determine whether a drug such as rohypnol--the so-called "date-rape" drug--has been used in sexual assaults.

Forensic odontology, which is also known as forensic dentistry, deals with dental evidence. It is usually used to identify bodies or to link bite marks on victims to dental impressions of suspects. Forensic psychiatrists combine knowledge and practical experience in medicine, mental health, and the neurosciences and are called upon to testify in the courtroom regarding psychological disorders and disabilities.

Forensic anthropologists are most frequently called upon when human skeletal remains are found. Anthropologists use the remains to assist in identifying victims. They may also provide approximate dates and causes of death. Forensic entomology studies how insects colonize dead bodies. On the basis of examination of insects, estimates of times of death can be made. Forensic serologists specialize in identifying and processing blood, semen, saliva, and other bodily fluids. They may also be involved in analyses of bloodstains, blood spatters, and DNA specimens. Such evidence is often crucial in sexual assault cases and homicide investigations.

### **Criminalistics**

Criminalistics is a broad area of forensics that is concerned with analyses of a wide variety of evidence. It encompasses questioned documents, voice examinations; ballistics and firearms; tool marks; fingerprints; tire-tracks and shoe prints; paint and glass fragments; hair, fibers, and soil; and arson and explosives. The area of questioned documents includes all types of possible forgeries of documents, papers, inks, computer copies, and handwriting analysis. Voice examination is employed to identify speakers and to ascertain whether speakers are telling the truth.

Ballistics is the study of the physics of objects in flight. In forensics, it is primarily concerned with bullets and other projectiles used as weapons. Ballistics experts can determine the angles at which projectiles strike surfaces and the damage that the projectiles cause.

Experts in firearms study all types of guns, shotguns, bullets, cartridges, and cases. Tool marks are most often found at the scenes of burglaries and other crimes at which criminals gain forcible entry into secured areas. Fingerprint experts dust for, lift, and interpret fingerprint evidence left at crime scenes. Tire-tracks and shoe prints, like fingerprints, are impressions that are often left at crime scenes and can be lifted or copied in castings made with plaster-like materials.

Many experts deal with fragment and fiber evidence and examine the microscopic differences in paints, glass, hairs, fibers, and soils. For example, through thorough examination, it may be possible to match minute samples from a crime scene with the paint or glass on a suspect's car. Paint and glass examination are frequently important in the prosecution of hit-and-run cases.

### **Affiliated Fields**

Areas related to forensic science include forensic psychology, forensic nursing, forensic accounting, forensic engineering, and forensic computer analysis. Forensic