

Forensic Science and the Law



**FBI Building
Washington, DC**

Central Focus

- Students can explain the **history** of forensic science techniques and how the **law** influences evidence collection and analysis. Students can explain the types of evidence that are analyzed by specific units within a criminal department.



Georgia Standard

- **SFS1. Students will recognize and classify various types of evidence in relation to the definition and scope of Forensic Science.**

a. Compare and contrast the history of scientific forensic techniques used in collecting and submitting evidence for admissibility in court (e.g. Locard's Exchange Principle, Frye standard, Daubert ruling).



Day 5: Essential Question

- **Why has science become integrated into the practice of law?**
- **What types of laws govern our land?**



Laws that Pertain to the U.S. Criminal Justice System



- The U.S. Constitution
- Statutory Law
- Common Law or Case Law
- Equity Law
- Administrative Law
- Civil Law
- **Criminal Law**



The U.S. Constitution

- The supreme body of laws that governs our country.
- It overrules the constitutions of the individual states.



Statutory Law

- “Law on the books”
- Written law as enacted by the **states** legislation
- Legislative acts declaring, commanding, or prohibiting something.



Common Law or Case Law

- Body of law made up of judicial opinions and precedents.
- *stare decisis*, “to stand by the decision” - recognize **previous** decisions as **precedents**
- Four issues guide precedent: predictability, reliability, efficiency, and equality.



Equity Law

- Is **corrective** or **preventive** (such as an injunction or a restraining order).
- These laws are for cases NOT covered by common law.



Administrative Law

- Includes rules or laws established by **agencies** such as the Internal Revenue Service (IRS), Social Security Administration, or branches of the military.



Department of the Treasury
Internal Revenue Service



Civil vs. Criminal Cases

- **Civil cases** - involve disputes **between** individuals, government, organizations, or businesses.
 - the case is initiated by one side.
 - concerned with **assigning blame**.
 - A **preponderance** of evidence is required to convict.
 - The remedy is usually in the form of fines or transfer of property.



VS



Civil vs. Criminal Cases

- **Criminal cases**- crimes **against** an individual (becomes the **defendant**).
 - State initiates the case (becomes the **plaintiff**)
 - State must prove **beyond a reasonable doubt** to convict.
 - The remedy is in the form of fines, community service, probation, and/or incarceration.
- **Both civil and criminal cases may be heard before a jury!**



V
S



Quick Review

- What is the difference between “preponderance of evidence” and “beyond a reasonable doubt”?
- Who is the **plaintiff** in a criminal case?
- Who is the **defendant** in a criminal case?



The Law and Forensic Science

- Forensic scientists examine evidence concerning the breaking of **any** type of law
- **All** collectors and handlers of evidence must be aware of the rights guaranteed in the Bill of Rights of the U.S. Constitution
 - **all** evidence must be collected properly without violating any individual rights.



Cornerstone of Criminal Law is The Bill of Rights

Gives everyone the right ...

To be presumed innocent until proven guilty

Not to be searched unreasonably

Not to be arrested without probable cause

Against unreasonable seizure of personal property

Against self-incrimination

To fair questioning by police

To protection from physical harm throughout the justice process

To an attorney

To trial by jury

To know any charges against oneself



Bill of Rights, *continued*

To cross-examine prosecution witnesses

To speak and present witnesses

Not to be tried again for the same crime

Against cruel and unusual punishment

To due process

To a speedy trial

Against excessive bail

Against excessive fines

To be treated the same as others, regardless of race, gender, religious preference, country of origin, or other personal attributes



4th of July

Types of Crimes

Infraction: minor offense or petty crime; penalty is usually a fine

Ex. Jaywalking, traffic violations, and littering

Misdemeanor: minor crime punishable by fine or jail (< 1 year)

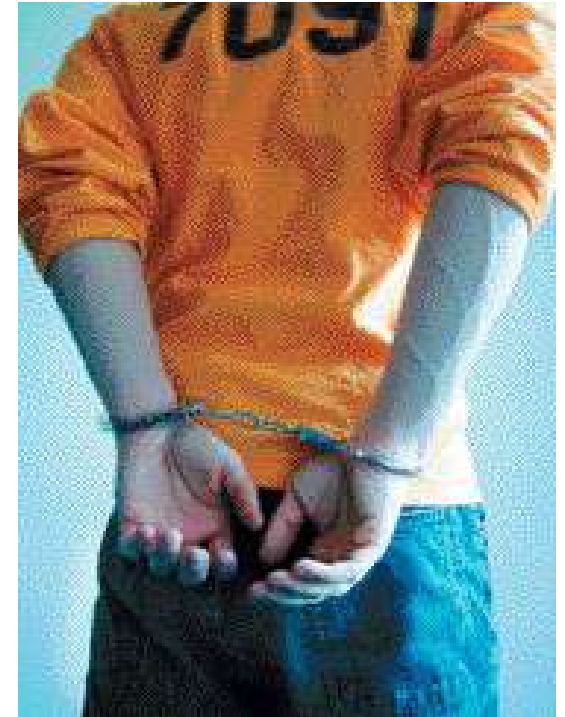
Ex. First offense of drunk driving, vandalism, shoplifting, simple assault, trespassing, or prostitution.

Felony: major crime punishable by fines and/or > 1 year in prison

Ex. Arson, aggravated assault, burglary, robbery, homicide, and rape.

Inchoate Offense: crime does not have to be complete to be arrested, charged, punished

Ex. Conspiracies, attempted rape



Steps in Pursuing Justice

1. Crime is committed
2. A suspect may be identified
3. Crime scene is documented and searched for evidence
4. Police investigate/information is collected
5. All information assembled into a report for the prosecutor



Steps in Pursuing Justice

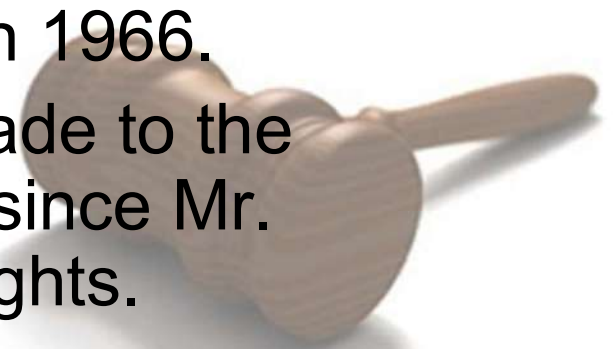
6. An investigation ensues
7. If there is **probable cause**, an arrest warrant is issued
8. After suspect is informed of their *Miranda* rights, they are arrested, booked, fingerprinted, and photographed



Probable cause: reasonable belief based on facts that is required to arrest and prosecute an individual

Miranda v Arizona

- In 1963, Ernesto Miranda, a 23 year old mentally disturbed man, was accused of kidnapping and rape in Phoenix, Arizona.
- Upon questioning he **confessed** to the crime; he was never told he did not have to speak or that he could have a lawyer present.
- At trial, Miranda's lawyer tried to get the confession thrown out, but the motion was **denied**.
- The case went to the Supreme Court in 1966.
- The Court ruled that the statements made to the police could not be used as evidence, since Mr. Miranda had not been advised of his rights.



Miranda Rights

- *The following is a minimal Miranda warning:*

You have the **right to remain silent**. Anything you say can and will be used against you in a court of law. You have the **right to speak to an attorney**, and to have an attorney present during any questioning. If you cannot afford a lawyer, one will be provided for you at the government's expense.



What Amendments are mentioned in the Miranda Rights?

Steps in Pursuing Justice

9. **Arraignment**- brought before court to hear charges
10. **Plea**- guilty, not guilty, not guilty by reason of insanity, double jeopardy, or *nolo contendere* (no contest)
11. Preliminary or evidentiary hearing or grand jury
12. Trial, if suspect is **indicted** (i.e. formally charged)



Double Jeopardy

- Clause of the 5th Amendment
- Cannot be prosecuted twice for the same crime after a legitimate acquittal or conviction.

Acquittal – not guilty of the crime

Conviction – guilty of the crime

https://www.youtube.com/watch?v=i5qONB-dn_w



Day 6 Essential Question

“If the Law has made you a witness, remain a man (woman) of science. You have no victim to avenge, no guilty or innocent person to ruin or save. You must bear testimony within the limits of science.”

—P.C.H. Brouardel

EQ: What determines admissibility of evidence in a criminal trial?



Facets of Guilt

To prove a case, the “MMO” must be established; it must be shown that the suspect had:

Motive—person had a reason to do the crime
(not necessary to prove in a court of law)

Means—person had the ability to do the crime

Opportunity—person can be placed at the
crime scene



- *In the United States, a person is presumed **innocent** until proven guilty beyond a reasonable doubt by a jury of his or her peers.*
- *The burden of proof in criminal cases rests entirely on the prosecution.*



Skills of a Forensic Scientist

- must apply the principles and techniques of science to the analysis of **any** evidence recovered during a criminal investigation.
- may provide expert court testimony.
- **expert witness** – a person whom the court (i.e. judge) determines possesses knowledge relevant to the trial that is *not expected of the average person*.



Rule 702- Testimony by Expert Witnesses

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion if:

- (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence
- (b) the testimony is based on sufficient facts/data;
- (c) the testimony is from reliable principles and methods; and
- (d) the expert has reliably applied the facts of the case



Who is the “Trier of fact”?

The Expert Witness

The expert witness presents scientific evidence in court.

He/She will:

- Establish credibility through credentials, experience.
- Evaluate evidence.
- Render an **opinion** about the evidence.
- The trier of fact may accept or reject the opinion's significance.



Federal Rules of Evidence

In order for scientific evidence to be admitted in a court of law, it must be:

Probative: actually proves something

Material: addresses an issue that is relevant to the particular crime



Admissibility of Evidence

- *Frye v. United States* - 1923
 - Frye was convicted of 2nd degree murder
 - Frye wanted to submit the results of a polygraph test
 - He was denied because polygraph tests were **NOT** generally accepted within their field as being particularly accurate



Result: *The Frye Standard*

- Scientific evidence is allowed into the courtroom if it is **generally accepted** by the relevant scientific community.
- The *Frye* standard does not offer any guidance on reliability.
- The evidence is presented in the trial and the **jury** decides if it can be used.



Admissibility of Evidence

- *Daubert v. Merrell Dow Pharmaceuticals, Inc.* – 1993
 - Daubert claimed limb reduction birth defects after ingesting drugs manufactured by Merrell Dow
 - Most of the scientific community did not agree that the research supported that the drug could cause limb deformities
 - Children of mothers who did not take the drug also experienced limb deformities
 - Daubert's expert witnesses had not conducted research on the drugs outside of the case and did not have their research **peer-reviewed**, so testimony was deemed **inadmissible**

Result: The Daubert Standard

- The **judge** acts as a “gatekeeper”. He/She decides if the evidence can be entered into the trial.
- Admissibility is determined by:
 - Whether the theory is **generally accepted** in the scientific community;
 - Whether the theory/method has been subjected to **peer review** and publication;
 - Whether the theory/method has been **tested** or can be tested;
 - Whether the potential or known **rate of error** is acceptable.



Replaced Frye Standard in Federal cases

Admissibility of Evidence

- *Kumho Tire Co., LTD v Carmichael*

- Carmichael alleged a defect in a Kumho tire resulted in the death of a passenger and injuries in others after a car accident
- Carmichael called a tire failure analyst as an expert witness
- Judge deemed testimony **inadmissible** because did not meet Daubert Standard
- The Eleventh Circuit reversed the decision.



Result: *Kumho Tire Co., LTD v Carmichael*

- Gatekeeping role of the judge applies to **ALL** expert testimony



Admissibility of Evidence

- ***Coppolino v. State***

- Coppolino murdered his wife with an overdose of an anesthetic
- Scientist had to devise a **new test** to identify the drug in the body in order to prove the crime

Result: New and unique tests for evidence may be admissible, but **ONLY** if they are based on scientifically valid principles and techniques



Criminal Defense

- Three elements, called *corpus delicti* (meaning “body of crime”), must be present in order for an act to be labeled a crime:
 - The **criminal act** (*actus reus*)
 - **Criminal intent** (*mens rea*)
 - Relationship between *actus reus* and *mens rea* (**concurrency**).



Six Arguments (pleas)

- Can be used in the defense against a criminal indictment:
 - My client did not do it (Alibi)
 - My client did it, but is not responsible because he or she is insane
 - My client did it but has a good excuse (Age)
 - My client did it but has a good reason (Self-defense)
 - My client did it but should be acquitted because the police or the prosecutor cheated (Entrapment)
 - My client did it but was influenced by outside forces (PMS, Vet)

