

History of Forensic Science

Course
Forensic
Science

Unit II
History

**Essential
Question**
Who's Who in
Forensic
Science?

TEKS
§130.295(c)
(4)(E)(F)

**Prior Student
Learning**
none

Estimated Time
Two 45-min
Lectures

45-min Timeline
Activity

Rationale

Forensic science is the application of science to criminal and civil law, making the scientist in the crime laboratory an active participant in the criminal justice system. An understanding of the origin and development of forensic science is imperative for effective communication in the courtroom.

Objectives

The student will be able to:

1. Recognize the major contributors to the development of forensic science.
2. Illustrate the history of forensic science.

Engage

Discuss the following article with your class:

<http://www.crimemuseum.org/library/forensics/origins.html>. Use the Discussion Rubric for assessment.

Key Points

- I. Before the 17th Century
 - A. Guilty persons were thought to confess under torture, while God would give an innocent person the strength to resist the pain (similar to the Salem Witch Trials).
 - B. The earliest record of the application of forensic science was back in the 3rd century in China. A woman claimed that her husband died when he was unable to escape from a house fire. A suspicious coroner performed an experiment in which he burned one pig alive and burned another pig that was already dead. He noticed that the pig that was burnt alive had ashes inside its mouth while the dead pig did not. Upon finding the deceased man's mouth to be free of ashes, he questioned the widow, and she confessed to murdering her husband and burning his body to destroy the evidence.
- II. The 18th century – in 1775, Carl W. Scheele, a Swedish chemist, devised the test for detecting arsenic in corpses.
- III. The 19th century
 - A. Medical advancements enabled medical examiners (MEs) to determine causes of death.
 - B. The development of microscopes allowed trace evidence examination.
 1. 1828 – polarizing microscope invented
 2. 1839 – first microscopic detection of sperm
 - C. The development of chemical tests allowed for more evidence testing

1. 1806 – Valentin Ross (German chemist) discovered the precise method of detecting small amounts of arsenic.
 2. 1814 – Mathieu Orfila, Father of Forensic Toxicology, published articles on the detection of poisons and effects.
 3. 1839 – the first use of toxicological evidence in a criminal trial
 4. 1863 – the first presumptive test for blood was discovered.
- D. 1850-1860s – the development of photographs allowed for more accurate records and documentation.
- E. 1879 – Alphonse Bertillon, a French anthropologist, introduced the Bertillon System, also called Anthropometry. It was a system of identifying people by their physical appearance. Various measurements were taken and recorded from various parts of the body. It was considered to be the most accurate method of personal identification until the Will West case in 1903.
- F. 1888 – London was terrorized by “Jack the Ripper.”
- G. 1893 – the first book of criminal investigation using forensic science, *Criminal Investigation*, was published by Hans Gross from Austria.
- H. The most influential figure in 19th century forensic science was “Sherlock Holmes,” the fictional character created by Sir Arthur Conan Doyle. His influence can be compared to the popularity of modern crime scene investigation television shows.

IV. The 20th Century

- A. 1903 – Kansas State Prison incarcerated two individuals by the name of Will West. They both had identical facial features and body measurements, by the Bertillon’s System. This led to the end of Anthropometry and the beginning of acceptance for fingerprinting.
- B. 1901 – Karl Landsteiner discovers ABO blood typing.
- C. 1910 – *Questioned Documents* published by Albert Osborn.
- D. 1913 – Locard's Exchange Principle by Edmond Locard (French)
 1. When two objects come into contact with each other, they exchange materials. This is called cross-transfer.
 2. Locard also started the first known Police Crime Lab in France.

V. Walter McCrone (USA, 1916-2002) was the leading expert in microscopy.

VI. History of Crime Labs in the US

- A. 1923 – Los Angeles PD Crime Lab is the first in the US
- B. 1930 – the University of California at Berkeley Criminalistics Department was opened and led by Dr. Paul Kirk.
- C. 1932 – FBI National Laboratory opened under Director J. Edgar Hoover.
- D. 1981 – FBI Forensic Science Research & Training Center opened five Federal Crime Labs in the USA.
 1. The FBI Laboratory (Quantico, VA)

2. The Drug Enforcement Administration (DEA) Laboratories analyze drugs seized in violation of federal laws.
3. The Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) Laboratories analyze alcoholic beverages, weapons, and explosive devices.
4. The U.S. Postal Inspection Services Laboratories
5. The United States Army Criminal Investigation Laboratory (USACIL) in Ft. Gillem, GA

VII. Local Crime Labs

- A. Houston Police Department Crime Laboratory
- B. Harris County Medical Examiner's Office
- C. Texas Department of Public Safety Forensic Laboratories
 1. Headquarters in Austin, TX
 2. Fourteen total locations including Houston, Abilene, Amarillo, Corpus Christi, Garland, Lubbock, Tyler, and El Paso
- D. Major Crime Labs abroad
 1. Britain has the British Home Office.
 - a) Metropolitan Police Laboratory, Scotland Yard, services London
 - b) Five other regional labs
 2. Canada has the Royal Canadian Mounted Police (RCMP) laboratories
 3. Centre of Forensic Sciences in Toronto, Canada
 4. The Institute of Legal Medicine and Police Science in Montreal, Canada

Activities

Create a historical timeline poster. Have students work as individuals, or in small groups, to create a historical timeline poster by arranging events in the history of forensic science and the crime laboratories in chronological order. The students may present their posters to the class. Use the Presentation Rubric for assessment.

Assessments

History of Forensic Science Quiz and Key
Discussion Rubric
Presentation Rubric
Research Rubric

Materials

History of Forensic Science computer-based presentation
Posters and drawing materials

Resources

Saferstein, Richard. *Forensic Science: An Introduction*. New Jersey:

Pearson Prentice Hall, 2008.
Bertino, Anthony J. *Forensic Science: Fundamentals and Investigations*.
Mason, OH: South-Western Cengage Learning, 2009.
<http://www.crimemuseum.org/library/forensics/origins.html>

Accommodations for Learning Differences

For reinforcement, the students will research their local and state crime laboratories and the services offered by each laboratory. Use the Research Rubric for assessment.

For enrichment, the students will research and write a report on the analysis performed by Walter McCrone on the Shroud of Turin or the Vinland map. Use the Research Rubric for assessment.

State Education Standards

Texas Essential Knowledge and Skills for Career and Technical Education
§130.295. Forensic Science (One Credit).

(4) The student explores the history, legal responsibilities, and career options for forensic science. The student is expected to:

- (E) recognize the major contributors to the development of forensic science;
- (F) illustrate the history of forensic science.

College and Career Readiness Standards

Cross-disciplinary Standards

II. Foundational Skills

A. Reading across curriculum

C. Research across the curriculum

1. Understand which topics or questions are to be investigated.
2. Explore a research topic.
5. Synthesize and organize information effectively.
6. Design and present an effective product.
8. Present final product.

Name: _____

Date: _____

History of Forensic Science Quiz

Multiple Choices:

- 1) _____ Which of the following has developed a national system of regional labs under the direction of the government's Home Office?
 - a. Britain
 - b. Japan
 - c. The United States
 - d. Canada

- 2) _____ In 1923, _____ opened the first crime laboratory in the United States.
 - a. Arizona
 - b. Texas
 - c. New York
 - d. California

- 3) _____ Who stated in his principle that whenever objects come in contact with each other, there is a cross-transfer/exchange of evidence?
 - a. Mathieu Orfila
 - b. James Marsh
 - c. Edmond Locard
 - d. Hans Gross

- 4) _____ In 1932, the FBI Laboratory was opened by:
 - a. Paul Kirk
 - b. J. Edgar Hoover
 - c. Herbert Hoover
 - d. Edmond Locard

- 5) _____ Who published *Criminal Investigation*, in which he discussed the benefits of the use of science in crime investigations.
 - a. Hans Gross
 - b. Edmond Locard
 - c. Alphonse Bertillon
 - d. Karl Landsteiner

Short Answers:

6) Who is known as the Father of Toxicology? What accomplishment is he recognized for?

7) What is Anthropometry?

8) Name the 5 federal crime laboratories in the United States.

9) Who devised the first test for detection of Arsenic in 1775?

10) What was Walter McCrone known for?

History of Forensic Science Quiz Key

- 1) A
- 2) D
- 3) C
- 4) B
- 5) A
- 6) Mathieu Orfila is known as the Father of Toxicology for his publication of the first scientific treatise on the detection of poisons and their effects on animals.
- 7) Anthropometry is also known as the Bertillon System. It was introduced by the French Anthropologist, Alphonse Bertillon, who devised a system for identifying people by their physical appearance. It included various measurements of the body. The Bertillon System was replaced by Fingerprinting after it failed to distinguish between a set of identical twins (Will West case) in 1903.
- 8) - FBI Laboratory (Quantico, VA)
 - Drug Enforcement Administration (DEA) Laboratories
 - Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) Laboratories
 - U.S. Army Criminal Investigation Laboratory (Fort Gillem, GA)
 - U.S. Postal Inspection Service Laboratories
- 9) Carl Wilhelm Scheele
- 10) Walter McCrone was known as the leading forensic microscopist. He has worked some famous cases, such as the Shroud of Turin and the Vinland map forgery.

Name _____

Date _____

Discussion Rubric

Objectives	4 pts. Excellent	3 pts. Good	2 pts. Needs Some Improvement	1 pt. Needs Much Improvement	N/A	Pts.
Participates in group discussion						
Encourages others to join the conversation						
Keeps the discussion progressing to achieve goals						
Shares thoughts actively while offering helpful recommendations to others						
Gives credit to others for their ideas						
Respects the opinions of others						
Involves others by asking questions or requesting input						
Expresses thoughts and ideas clearly and effectively						
Total Points (32 pts.)						

Comments:

Name: _____

Date: _____

Presentation Rubric

Objectives	4 pts. Excellent	3 pts. Good	2 pts. Needs Some Improvement	1 pt. Needs Much Improvement	N/A	Pts.
Topic/Content <ul style="list-style-type: none"> • Topic discussed completely and in-depth • Includes properly cited sources (if used) 						
Creativity/Neatness <ul style="list-style-type: none"> • Integrates a variety of multimedia effects to create a professional presentation (transition and graphics) or appropriate visual aid used • Title slide, table of contents, bibliography are included, using acceptable format 						
Mechanics <ul style="list-style-type: none"> • Grammar, spelling, punctuation, and capitalization are correct • Image and font size are legible to the entire audience 						
Oral Presentation <ul style="list-style-type: none"> • Communicates with enthusiasm and eye contact • Voice delivery and projection are dynamic and audible 						
Audience Interaction <ul style="list-style-type: none"> • Presentation holds audience’s attention and relates a clear message • Clearly and effectively communicates the content throughout the presentation 						
Total Points (20 pts.)						

Comments:

Name _____

Date _____

Research Rubric

Objectives	4 pts. Excellent	3 pts. Good	2 pts. Needs Some Improvement	1 pt. Needs Much Improvement	N/A	Pts.
Question/goal Student identified and communicated a question or goal of the research						
Research/Gathering information (if relevant) Student used a variety of methods and sources to gather information. Student took notes while gathering information						
Conclusion/Summary Student drew insightful conclusions and observations from the information gathered. Information is organized in a logical manner						
Communication Student communicated the information gathered and summary or conclusions persuasively. Student demonstrated skill in the use of media used to communicate the results of research						
Reflection Student reflected on the importance of the research and its potential application						
Total Points (20 pts.)						

Comments: