

FORENSIC SCIENCE CURRICULUM OUTLINE

I. Unit 1 :Intro to Forensic Science

- A. What is Forensic Science?
- B. Duties of Forensic Scientist
 - a. Collection and Preservation of Evidence
 - b. Analyzing and Admissibility of Evidence –
 - i. Junk Science – Anthropometry Activity
 - ii. Designing A Valid Experiment – Evaluating the Canadian Hair Study
 - iii. Jasclevich and Coppelino cases, Frye test, and Federal Rules of Evidence Debate
 - c. Testimony - OJ Simpson Case: Dennis Fung Testimony
- C. Divisions of the Forensic Laboratory –
 - a. Evidence Custodian Activity
 - b. Want Ads Activity
 - c. Anthrax Case Study
- D. History of Forensic Science: PROJECT: CV of a Famous Forensic Scientist

II. Unit 2: The Art of Observation

- A. Observation vs. Inference - Cube Activity, Artwork Observation Activity
- B. Eyewitness Accounts – You're the Eyewitness Activity – Pearson Video
- C. Influences of Observation activity - PROJECT: Designing an Observation Experiment
- D. The Innocence Project – After Innocence (95minutes)

III. Unit 3: Physical Evidence

- A. Common Types of Evidence. – Evidence web
- B. Class Characteristics vs. Individualization – Penny Lab
- C. Physical Properties vs. Chemical Properties
 - a. Density and Refractive Index of Glass Lab
 - b. Reconstruction of Glass Window Pane Lab
 - c. Soil Lab
 - d. PROJECT: The Case of Sweet Sabotage (white powders lab)
 - e. CASE STUDY: – Enrique Camarena Case

IV. Unit 4: the Crime Scene

- A. Processing the Crime Scene – What went wrong activity?
- B. Documentation Rules – Document fictional Crime Scene
- C. Sketches - Activity Sheet
- D. FORENSIC PHOTOGRAPHY LAB.
- E. Collecting and packaging Evidence – Chain of Custody Activity
- F. The Crime Scope – Fluorescent materials Activity
- G. LOCARDS PRINCIPLE - Sock experiment
- H. MOCK CRIME SCENE – LAB
- I. CASE STUDY: OJ Simpson

V. Unit 5: Fingerprints

- A. The Principles of Fingerprints
- B. Classifying fingerprints – Henry System and NCIC
- C. Collecting exemplars and Classifying Lab
- D. Individualizing a Fingerprint Lab
- E. Developing Latent Print Labs: Dusting, Superglue fuming, Iodine fuming, Ninhydrin
- F. John Dillinger Video / Autopsy 6 Clip

VI. Unit 6: Forensic Chemistry

- A. Inorganic vs. Organic
- B. White Powders LAB
- C. Instrumentation: Presumptive ID vs. Specific ID, Qualitative vs. Quantitative
- D. How many tests are needed to ID? ACTIVITY

- E. Inorganic Instrumentation: Emission Spec, AAS, and NAA
- F. Trace element Analysis – JFK bullet fragments
- F. Organic Instrumentation: Chromatography: GC, HPLC, TLC AND Spectrophotometry: UV-vis, FTIR, and Mass Spec.
- G. GC ACTIVITY
- H. FTIR ACTIVITY
- I. PROJECT: POISON PROJECT – Students are assigned various organic and inorganic poisons and create a news report on a fiction or real case involving the poison.

VII. Unit 7: Drug Chemistry

- A. Drugs of Abuse and Controlled Substances Act
- B. Screening tests for Drugs – Color tests
- C. Color tests for over the counter drugs LAB
- D. Instrumentation – Gas Chromatography, Mass Spec, Emission Spec, FT-IR, UV/Vis Spectrophotometry
- E. TLC of Over the Counter Drugs LAB
- F. PROJECT: My Life on Drugs Poster – Students illustrate the short term and long term effects, signs of abuse, physiological and psychological effects of the drugs of abuse.

VIII. Unit 8: Toxicology

- A. Alcohol and the Breathalyzer Demo
- B. Drug Recognition Experts - Drug Influence Evaluation Activity
- C. Extraction, Screening, and Confirmatory Tests
- D. Urine Screening LAB
- E. Poisons - Joanne Curley Case and Autopsy 6 Clip

IX. Unit 9: Question Documents

- A. Handwriting Analysis LAB
- B. Forgery and Erasures LAB
- C. Ink Chromatography LAB
- D. Counterfeiting LAB
- E. PROJECT – Group presentations of famous cases involving Questioned Documents: Jon Beet Ramsey, Son of Sam, Zodiac Killer, DC Sniper, Unabomber, Lindberg Baby Kidnapping, Jack the Ripper, Hitler Diaries, Weinberger Kidnapping, Howard Hughes Forgery.

X. Unit 10: Trace Evidence: Hairs, Fibers, Paint and Pollen

- A. Hair
 - a. Morphology of Hair
 - b. Microscope Lab
 - c. Species of Hair Lab and Casting Hair Lab
 - d. Human Hair Lab
 - e. PROJECT: HAIR TESTIMONY ESSAY
- B. Fibers
 - a. Properties of Fibers
 - b. Fiber Lab – microscopy and burn test
- C. Pollen Identification Lab
 - Project: Pollen Expert Witness Presentation
- D. Paint – Westchester Fire Chief Case Hit and Run

XI. Unit 11: Blood Spatter Reconstruction

- A. Blood Spatter Analysis
- B. HEIGHT VS SURFACE Lab
- C. DIRECTIONALITY Lab
- D. ORIGIN OF THE BLOOD SHED Lab
- E. PROJECT - Sam Sheppard Case Study

XII. Unit 12: Serology: Blood, Semen, and Saliva

- A. Blood
 - a. Composition of Blood
 - b. COLOR TESTS – Luminol Lab
 - c. SPECIES TEST – Immunoassay Lab
 - d. Personality versus Blood Type Activity
 - e. BLOOD TYPE – Lattes test

- B. Semen and Saliva
 - a. Composition of Semen and Saliva
 - b. SECRETOR LAB

XIII. Unit 13: DNA

- A. Structure and Function
- I B. Inheritance – Punnet's Squares
- C. Mitochondrial vs. Nuclear DNA – Family Tree Coloring Activiy
- D. RFLP simulation LAB
- E. Paternity Testing – Who are the parents Activity?
- F. Polymerase Chain Reaction
- G. PROJECT: Mitochondrial DNA LAB

XIV. Unit 14: Forensic Anthropology

- A. Age, Sex and Race of Skeleton LAB
- B. Bone Density and Body Size
- C. Height and Body Proportions
- D. Medical Examiners Findings
- E. PROJECT: Romanov Family Case Study

XV. Unit 15: Firearms and Tool marks

- A. Rifled Firearms: Caliber, Lands and Grooves, Direction of Twist, and Striations
- B. Identifying bullets, casings and shotgun shells LAB
- B. Bullet Trajectories
- C. PROJECT: JFK Case Study
- D. Tool marks LAB
- E. Serial Number Restoration LAB

XVI. Unit 16: Arson and Explosives

- A. Arson Sniffing Dog Video – Prentice Hall
- B. Hunt For the Serial Arsonist
- C. The Bombing of America Video

XVII. Unit 17: Casts and Impressions

- A. Forensic Odontology
- B. Shoe Size and Height Activity
- C. Casting shoe impressions
- D. Tire impressions –Prentice Hall Tire Video
- E. Vehicle Identification

XVIII. Unit 18: Forensic Pathology

- A. Determining Time of Death
- B. Forensic Entomology
- C. Determining Cause of Death
- D. Autopsy 1 and 2 – HBO and Michael Baden
- I E. Interactive Autopsy – Dr. Baden online HBO
- F. Julia Delgado – Guest Speaker, Brooklyn Medical Examiner