

Examining the Evidence CTY Course Syllabus

Day 1: Welcome, Introduction to Forensic Science, Observation & Deductive Reasoning

Session	Objectives/Activities	Materials Needed
A	<ul style="list-style-type: none"> - Welcome - Ice-Breaker: Create a Wanted poster of another student - CTY honor code review - Lab safety - Lab safety contracts - Forensic Science KWL chart 	<ul style="list-style-type: none"> - Board - Wanted poster copies - Markers/crayons - Lab safety cartoon
B	<ul style="list-style-type: none"> - Deductive Reasoning: <ul style="list-style-type: none"> o The Deadly Picnic 	<ul style="list-style-type: none"> - Deadly picnic copies
C	<ul style="list-style-type: none"> - Pre-test - Deductive Reasoning: Tell the Tale <ul style="list-style-type: none"> o Purse Dissection & story creation 	<ul style="list-style-type: none"> - Pre-test copies - Tell the tale copies - Purses w/ contents
D	<ul style="list-style-type: none"> - Observation exercise/ Memory game - Introduce mystery write – Students chose a focus for their mystery and listed accompanying details 	<ul style="list-style-type: none"> - Mystery write copies
HWK	<ul style="list-style-type: none"> - Pg 11-17 “The Crime” - Pg 25-41 “The Investigation” <ul style="list-style-type: none"> o 3-2-1 on “The Investigation” 	
TEST	<ul style="list-style-type: none"> - Criminalist – crime scene and crime lab worker 	

Day 2: Crime Scene Processing

Session	Objectives/Activities	Materials Needed
A	<ul style="list-style-type: none"> - Drill: forensic science definition and deductive reasoning - Compare the scientific method to solving a crime using counterfeit money - Go through each step of the crime scene processing checklist - Search methods – notes, go outside to practice grid, line, zone, spiral. Evaluate the effectiveness of each 	<ul style="list-style-type: none"> - 2 \$1 bills - Spray starch - CS Processing checklist copies - Search methods copies - Bucket of army men
B	<ul style="list-style-type: none"> - Discuss three ways to record a crime scene: photo, notes, sketch - Read “Sketches” and answer 4 accompanying questions - Discuss and practice triangulation 	<ul style="list-style-type: none"> - Crime scene photo PowerPoint - Sketches reading - Sketches checklist - Tape measures (1 per group) - Compass - Example sketch

Session	Objectives/Activities	Materials Needed
C	<ul style="list-style-type: none"> - In a group complete the following: <ul style="list-style-type: none"> o Rough crime scene sketch o Overall, mid-range, and close-up pictures o Notes 	<ul style="list-style-type: none"> - Mock crime scene set-up - Camera
D	<ul style="list-style-type: none"> - Final sketch – drawing an image to scale 	<ul style="list-style-type: none"> - Graph paper - Calculators
HWK	<ul style="list-style-type: none"> - Finish final sketch 	
TEST	<ul style="list-style-type: none"> - 1st responder's 1st job – provide medical assistance 	

Day 3: Introduction to Trace Evidence - Glass

Session	Objectives/Activities	Materials Needed
A	<ul style="list-style-type: none"> - Drill: crime scene integrity & role of 1st responder - What is trace evidence? List types - Discuss how a glass fracture happened <ul style="list-style-type: none"> o Radial, concentric, direct, projectile, entrance/exit holes 	<ul style="list-style-type: none"> - Glass frames
B	<ul style="list-style-type: none"> - Density as a property of glass <ul style="list-style-type: none"> o Which is more dense questions o Reading a meniscus o Water displacement o Density Calculations - Discuss guidelines for lab report 	<ul style="list-style-type: none"> - Coke & Coke Zero - 100mL graduated cylinders - Water - Marbles - Density & Water displacement copies - Lab report format copies
C	<ul style="list-style-type: none"> - Glass lab 	<ul style="list-style-type: none"> - Glass samples - Glass lab copies - 100mL graduated cylinders - Balance - Tweezers/Forceps
D	<ul style="list-style-type: none"> - Refractive Index Worksheet - Case study analysis 	<ul style="list-style-type: none"> - RI copies
HWK	<ul style="list-style-type: none"> - Pg 165-175 - Complete “Interactive Notes” 	
TEST	<ul style="list-style-type: none"> - Density calculation given mass & volume - Exit hole is larger than entrance hole 	

Day 4: Hair

Session	Objectives/Activities	Materials Needed
A	<ul style="list-style-type: none"> - Drill: Glass review using windshield - Microscope <ul style="list-style-type: none"> o ID parts, total power, field of view, observations and sketches o “e” microscope lab 	<ul style="list-style-type: none"> - Glass windshield - Slides - Coverslips - Droppers (w/ water) - Newspapers - Tweezers - Scissors
B	<ul style="list-style-type: none"> - Hair Notes: Discuss characteristics of hair <ul style="list-style-type: none"> o Match medulla & cuticle patterns to species - What hair can tell you – forcible removal, pulled out before or after death, dying 	<ul style="list-style-type: none"> - Hair notes - Hair powerpoint
C	<ul style="list-style-type: none"> - Hair Lab 	<ul style="list-style-type: none"> - Carolina Hair Kit - Lighter/Matches - Clear fingernail polish - Colored Pencils - Ruler
D	<ul style="list-style-type: none"> - Case study analysis 	
HWK	<ul style="list-style-type: none"> - Complete hair lab 	
TEST	<ul style="list-style-type: none"> - Cuticle - Outer part of hair shaft - Hair has been forcibly removed if root is still attached and/or root damage 	

Day 5: Fibers & Time of Death

Session	Objectives/Activities	Materials Needed
A	<ul style="list-style-type: none"> - Drill: Hair review - Locard’s exchange principle - Read & Compare/Contrast types of fibers: natural, synthetic, regenerated - Write a procedure for lab 	<ul style="list-style-type: none"> - Venn Diagram - Sequence chains - Lab copies
B	<ul style="list-style-type: none"> - Fiber lab 	<ul style="list-style-type: none"> - Microscopes - Carolina Fiber Kit - Candles - Lighter/Matches - Slides - Coverslips - Tweezers - Colored pencils - Droppers (w/ water)

Session	Objectives/Activities	Materials Needed
C	<ul style="list-style-type: none"> - Conclude fibers lab - Fibers case studies - Packaging trace evidence <ul style="list-style-type: none"> o Pharmacy fold o Chain of custody 	<ul style="list-style-type: none"> - Paper - Paper clips - Tape
D	<ul style="list-style-type: none"> - Packaging trace evidence – Pharmacy fold - Fiber case study analysis - Decomposition Timeline - Algor Mortis graphing lab 	<ul style="list-style-type: none"> - Decomposition powerpoint - Algor mortis lab copies - Graph paper - Rulers - Calculators
HWK	<ul style="list-style-type: none"> - Chain of Custody – 10 people 	-
TEST	<ul style="list-style-type: none"> - Locard’s exchange principle definition, why there is no perfect crime - Rigor mortis - Stiffening of muscles 	-

Day 6: Anatomy & Pathology & Anthropology

Session	Objectives/Activities	Materials Needed
A	<ul style="list-style-type: none"> - Drill: trace evidence review, goal setting - Skeleton – match bones to skeleton (MS Word Document) - Bones reading Jigsaw - Question of Identity – measure the 4 long bones and calculate height 	<ul style="list-style-type: none"> - MS Word Skeleton Document - Bones reading & fill in worksheet - Question of Identity copies - Ruler/Yard Stick - Osteometric Boards - Calculator
B	<ul style="list-style-type: none"> - Finish Question of Identity 	
C	<ul style="list-style-type: none"> - Webquest in computer lab <ul style="list-style-type: none"> o Virtual Anatomy/Skeleton comparison of males & females o Virtual autopsy 	<ul style="list-style-type: none"> - Computer lab - Virtual autopsy copies
D	<ul style="list-style-type: none"> - Anthropology quiz - Mystery write 	<ul style="list-style-type: none"> - Anthropology quiz copies
HWK	<ul style="list-style-type: none"> - “Summary” Pg 43-59 – The Medical Examiner & Pg 87-101 – The Fickle Finger 	
TEST	<ul style="list-style-type: none"> - Anthropologist studies skeletal remains - Male vs. female skeleton - Phalanges – fingers and toes 	

Day 7: Fingerprints

Session	Objectives/Activities	Materials Needed
A	<ul style="list-style-type: none"> - Drill: Anthropology review - Bertillionage discussion – How effective was it & what replaced Bertillionage as a way of identifying people? - Discuss the three types of fingerprint patterns - Students ID their fingerprint types by completing a Modus Operandi (MO) chart <ul style="list-style-type: none"> o Collect data in excel spreadsheet to see if class statistics match world statistics of the percent of whorls, loops, and arches 	<ul style="list-style-type: none"> - Pencils - Tape - Stamp pads
B	<ul style="list-style-type: none"> - Discussion & view photos - Distinguish between latent, patent, and plastic prints - Physical and chemical methods of print removal 	
C	<ul style="list-style-type: none"> - Fingerprint lab - Dusting for Fingerprints lab 	<ul style="list-style-type: none"> - Wards Fingerprint Analysis Lab - Magnetic fingerprinting powder - Magnetic wand -
D	<ul style="list-style-type: none"> - Complete lab conclusion - Fingerprint review 	<ul style="list-style-type: none"> - Fingerprint review copies
HWK	<ul style="list-style-type: none"> - “Sealed by a Kiss” Lip-print take home lab 	<ul style="list-style-type: none"> - Lip prints - Lip print copies
TEST	<ul style="list-style-type: none"> - Best way to distinguish between identical twins - Cyanoacrylate – super glue used - AFIS – fingerprint database - Patent print – visible fingerprint - Latent print – invisible fingerprint - 3 fingerprint patterns: loop, whorl, arch - Bifurcations are found on a fingerprint - You should use charcoal black powder to dust for prints on light surfaces - Bertillionage – system to measure and record dimensions of body parts for identification 	

Day 8: Blood

Session	Objectives/Activities	Materials Needed
A	<ul style="list-style-type: none">- Display blood drops all over classroom- Drill: What is serology?- Collection methods- Answer the question "Is it blood?"<ul style="list-style-type: none">o Luminol Testo Kastle-Meyer Test lab<ul style="list-style-type: none">▪ Presumptive vs. conclusive▪ Positive & Negative control	<ul style="list-style-type: none">- Q-tips- Phenolphthalein kit- Is it blood? copies
B	<ul style="list-style-type: none">- Answer the question "Who did it come from?"- Blood typing notes and demonstration	<ul style="list-style-type: none">- Wards Simulated Whodunit blood typing kit- Toothpicks
C	<ul style="list-style-type: none">- Blood typing lab & write up- DNA KWL- Review the structure of DNA by coloring in a diagram- Discuss how traits are inherited- Discuss alleles, genotype, and phenotype, dominant, recessive	<ul style="list-style-type: none">- Wards Simulated Whodunit blood typing kit- Colored pencils or markers
D	<ul style="list-style-type: none">- Punnet Squares – Bikini Bottom Genetics	<ul style="list-style-type: none">- Bikini Bottom Genetics Copies
HWK	<ul style="list-style-type: none">- Punnet Squares – ABO inheritance and solve paternity case	<ul style="list-style-type: none">- ABO punnet squares copies
TEST	<ul style="list-style-type: none">- Blood type controlled by 2 alleles- Human blood types: A, B, AB, O- Forensic Serologist determines blood type- Punnet square – genetics tool that uses letters to represent dominant and recessive alleles- Universal recipient is AB- Universal donor: O – used in emergency transfusions- Punnet squares O & AB- 2 X chromosomes = female	

Day 9: DNA

Session	Objectives/Activities	Materials Needed
A	<ul style="list-style-type: none">- Drill: Blood typing check for understanding and review DNA/genetic principles- Created a wanted poster of a Snork by transcribing and translating the DNA code into traits	<ul style="list-style-type: none">- Snork copies- Colored pencils/markers
B	<ul style="list-style-type: none">- DNA extraction lab	<ul style="list-style-type: none">- Frozen strawberries- Sandwich zip-loc bags- Green Palmolive dish detergent- 100mL graduated cylinder- 10mL graduated cylinders- 95% Ethanol- Coffee filters- Toothpicks- DNA extraction copies- Dixie cups- 1mL plastic pipettes- Salt- Meat tenderizer
C	<ul style="list-style-type: none">- Gel electrophoresis<ul style="list-style-type: none">o PBS online simulation “It takes a lickin”o Cut & paste Gel electrophoresis activityo “Missing parents” paper lab on DNA fingerprinting and paternity	<ul style="list-style-type: none">- Poster paper- Scissors- Glue- Missing parents copies
D	<ul style="list-style-type: none">- Blood spatter webquest	<ul style="list-style-type: none">- Computer lab
HWK	<ul style="list-style-type: none">- Case study analysis: OJ Simpson	

Day 10: Blood Spatters

Session	Objectives/Activities	Materials Needed
A	<ul style="list-style-type: none">- Drill: Gel electrophoresis review- Height of blood spatter lab	<ul style="list-style-type: none">- Chocolate- Kryo syrup- ½ cup- Tablespoon- Teaspoon- Dropper bottles- 2 meter sticks per group- Ruler- Calculator
B	<ul style="list-style-type: none">- Create standard curve for data from lab using MS Excel- Identify the height of a mystery spatter	<ul style="list-style-type: none">- Computers w/ excel document- Mystery height spatters
C	<ul style="list-style-type: none">- Angle of impact lab	<ul style="list-style-type: none">- Meter sticks- Clipboards- Protractor- Trig tables- Ruler- Calculator
D	<ul style="list-style-type: none">- Identify the angle of impact of a mystery spatter- Blood Drip Investigation	<ul style="list-style-type: none">- Mystery angle spatters
HWK	<ul style="list-style-type: none">- Complete “OJ Simpson” reading & essay	

Day 11: Guest Speaker & Shoeprints

Session	Objectives/Activities	Materials Needed
A	<ul style="list-style-type: none">- Drill: What can you tell about the footprints on the floor? List answers on board- Guest Speaker: CSI<ul style="list-style-type: none">o Discuss crime scene processing from a CSI point of viewo Answer student questions	<ul style="list-style-type: none">- Footprint cutouts
B	<ul style="list-style-type: none">- Classify characteristics as class or individual- Identify class & individual characteristics of a practice shoeprint	<ul style="list-style-type: none">- Shoeprint copies

Session	Objectives/Activities	Materials Needed
C	<ul style="list-style-type: none"> - Casting Lab – cast prints outside - Examine shoeprint casts - Identify height, direction of travel, gait, speed, class & individual characteristics of cast, predict gender 	<ul style="list-style-type: none"> - Plastic zip-loc gallon size bags - Plaster of Paris - Soda boxes for frames - Sample impressions - Graph paper/Excel - Bio-foam - Brannock shoe size scale
D	<ul style="list-style-type: none"> - Size of shoe vs. height of students in the class comparison: scatter plot & linear regression 	<ul style="list-style-type: none"> - Graph Paper/Excel - Meter stick/measuring tape - Ruler
HWK	<ul style="list-style-type: none"> - Pg 61-72 & 82-85 - Written “Sum it Up” 	
TEST	<ul style="list-style-type: none"> - Wear pattern – marks made on the bottoms of shoes - Shoeprint to determine gender - Direction of travel by footprint 	

Day 12: Impressions & Ballistics

Session	Objectives/Activities	Materials Needed
A	<ul style="list-style-type: none"> - Drill: Shoeprint review - Odontology lecture – identify the categories of teeth, the crimes at which bite marks are generally found, class & individual characteristics - Bite Mark impressions lab 	<ul style="list-style-type: none"> - Teeth Impressions
B	<ul style="list-style-type: none"> - Matched tire patterns to cars in parking lot - “Tread Lightly” reading <ul style="list-style-type: none"> o Develop a procedure for tire track lab o Define track width and tread width, Identify class & individual characteristics 	<ul style="list-style-type: none"> - Paper - Crayon
C	<ul style="list-style-type: none"> - Tire Track Lab - Tool Mark Exercise 	<ul style="list-style-type: none"> - Matchbox car sets - Ink pad - Magnifying Glass - 11 screwdrivers - Clay - Ruler
D	<ul style="list-style-type: none"> - Ballistics Lecture <ul style="list-style-type: none"> o Define key terms: rifling, land, 	<ul style="list-style-type: none"> - Ballistics PowerPoint

Session	Objectives/Activities	Materials Needed
	groove, cartridge, bullet, barrel, caliber	- Spent cartridge casings
HWK	- Baltimore GSR Case Study & Letter to police department	- Baltimore sun article on GSR copies
TEST	- Rifling – spiral grooves in a bullet left by a gun barrel - IBIS – database of bullet patterns - GSR – Gun Shot Residue - Odontology – Identify a victim through dental remains	

Day 13: Ballistics Continued & Documents

Session	Objectives/Activities	Materials Needed
A	- Drill: Review job titles - Ballistics Investigation <ul style="list-style-type: none"> o Bullet & Barrel picture matching game o Cartridge & Caliber o Trajectory - Write the poem “Jack and Jill” three times - Handwriting analysis - Practice forging signatures	- Caliper - Trajectory molds & rods - Spent cartridges - Ruler - mm to caliber conversion chart - Bullet & Barrel matching cards - Tracing paper - Handwriting analysis copies
B	- Art forgeries	- Art forgeries copies
C	- Document Lab <ul style="list-style-type: none"> o Paper examination o Ink chromatography 	- Wards analysis of documents lab - Coffee filters - Chromatography jars
D	- Finish document lab	
HWK	- Document lab write up	

Day 14: Toxicology

Session	Objectives/Activities	Materials Needed
A	- Drill – Review ballistics - Program evaluations - Categorize types of drugs - Using printed sources students will research how a drug causes death and well known cases	- Printed research on drugs
B	- Toxicology Lab	- Wards Drugs & Poisons Analysis Kit

Session	Objectives/Activities	Materials Needed
C	<ul style="list-style-type: none"> - Play w/ FACES program - Post-Test 	<ul style="list-style-type: none"> - FACES & user agreements - Post-test copies
D	<ul style="list-style-type: none"> - Work on Mystery Write 	
HWK	<ul style="list-style-type: none"> - Complete mystery 	
TEST	<ul style="list-style-type: none"> - Cyanide prevents cells from using oxygen - FACES – program to develop suspect composites 	

Day 15: Mock Crime Scene & Closing

Session	Objectives/Activities	Materials Needed
A	<ul style="list-style-type: none"> - Mock Crime Scene 	<ul style="list-style-type: none"> - Set up
B	<ul style="list-style-type: none"> - Mock Crime Scene 	
Parents	<ul style="list-style-type: none"> - Each student presents and discusses evidence from the mock crime scene. 	