

Forensics : Unit 2: Evidence unit 1 (Fingerprints, blood, DNA, Hair, Toxicology, Anthropology, Autopsies)

Stage 1 Desired Results		
ESTABLISHED GOALS: <u>Competencies:</u> - Students will demonstrate the ability to observe and describe patterns in natural and human designed phenomena and use those patterns to support claims about the observed or predicted relationships among phenomena. - Students will demonstrate the ability to investigate, explain, and evaluate potential causal relationships by using evidence to support claims and predictions about the mechanisms that drive those relationships. - Students will demonstrate the ability to investigate and analyze a natural or human designed system in terms of its boundaries, inputs, outputs, interactions, and behaviors and use this information to develop a system model that can be used to understand and empirically evaluate the accuracy of models in terms of representing the underlying system. - Students will demonstrate the ability to investigate and analyze static and dynamic conditions of natural and human designed systems in order to explain and predict changes over time. - Student will demonstrate the ability to work collaboratively and individually to generate testable questions or define problems, plan and conduct investigations using a variety of research methods in a various settings, analyze and interpret data, reason with evidence to construct explanations in light of existing theory and previous research, and effectively communicate the research processes and conclusions. - Students will demonstrate ability to analyze and summarize text and integrate knowledge to make meaning of discipline-specific materials. - Students will demonstrate the ability to produce coherent and supported writing in order to communicate effectively for a range of discipline-specific tasks, purposes, and audiences. - Students will demonstrate the ability to speak purposefully and effectively by strategically making decisions about content, language use, and discourse style. <u>Content Standards:</u>	<i>Transfer</i>	
	Students will be able to independently use their learning to use information to draw a conclusion.	
	<i>Meaning</i>	
	ENDURING UNDERSTANDINGS Students will understand that... - biotic based evidence will link suspects to a crime scene - many biotic factors are specific to the individual - information can be used to draw a reasonable conclusion even without direct knowledge. - attention to detail and adhering to logic is critical to be successful in many situations	ESSENTIAL QUESTIONS - Is a person really who they say they are? - How can things be hidden in plain sight?
	<i>Acquisition</i>	
	Students will know... - that fingerprints are unique to individuals and can be used as evidence in arguing which individuals were present at a crime scene. - that serology involves a broad scope of laboratory tests that use specific antigen and serum antibody reactions. - that blood type is an inherited trait that is a permanent feature of a person's biological makeup. - that DNA has specific structure and function and is unique to each individual. - that there are DNA data bases to help solve crimes. - that drug analysis and toxicology is important in forensic science.	Students will be skilled at... -Constructing and revising explanations -Developing models -Applying scientific principles and evidence to provide an explanation -refining the design of a system -using mathematical representation -planning and conducting investigations -communicating scientific and technical information -Quantifying results -performing basic statistical analysis

● HS-LS1-1 Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including student's own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. ● HS-LS1-3 Plan and conduct an investigation individually and collaboratively to produce data to service as a basis for evidence, an in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on precision of the data (e.g., number of trials, cost, risk, times), and refine the design accordingly. ● HS-LS2-4 Use mathematical representations of phenomena or design solutions to support claims. ● HS-LS2-6 Evaluate the claims, evidence and reasoning behind currently accepted explanations of solutions to determine the merits of arguments. ● HS-LS2-8 Evaluate the evidence behind currently accepted explanations or solutions to determine the merits of arguments ● HS-LS3-3 Apply concepts of statistics and probability to scientific and engineering questions and problems, using digital tools when feasible ● HS-LS4-1 Communicate scientific information (e.g. about phenomena and/or the process of development and the design and performance of a proposed process of system) in multiple formats (including orally, graphically, textually, and mathematically).	● <i>blood alcohol content is based on human metabolism of alcohol</i> ● <i>that composition, development and structure of bones can be used to recognize the wealth of the individual.</i> ● <i>that an autopsy is performed if a death is suspicious or unexplained.</i> ● <i>that a forensic entomologist studies the development of insect larvae in a body to estimate the time of death.</i> ● <i>that determining time of death is important</i> ● <i>that environmental factors influence the time of death estimate.</i> ● <i>that human hairs contain DNA and can be used as evidence.</i> <u>vocabulary:</u> ridge characteristics, loop, swirl, whorls plastic and latent fingerprints, automated fingerprint identification system (AFIS), porous, blood: trace amount, puddles, spatters, smears, droplets, serology, ABo antigens and antibodies, agglutination, cohesion, adhesion, surface tension, gravity, directional propulsion, viscosity, nucleotide, short tandem repeat (STRs), polymerase chain reaction (PCR), CODIS, nuclear DNA, Mitochondrial DNA, gel electrophoresis, toxicology, metabolism, anthropology, autopsies, entomology, rigor, algor, livor mortis, corpse, medulla , cortex, cuticle, toxicology	
Content Area Literacy Standards		21st Century Skills
● RST.11-12.1 CITE SPECIFIC TEXTUAL EVIDENCE TO SUPPORT ANALYSIS OF SCIENCE AND TECHNICAL TEXTS, ATTENDING TO IMPORTANT DISTINCTIONS THE AUTHOR MAKES AND TO ANY GAPS OR INCONSISTENCIES IN THE ACCOUNT. ● RST.11-12.2 DETERMINE THE CENTRAL IDEAS OR CONCLUSIONS OF A TEXT; SUMMARIZE COMPLEX CONCEPTS, PROCESSES, OR INFORMATION PRESENTED IN A TEXT BY PARAPHRASING THEM IN SIMPLER BUT STILL ACCURATE TERMS. ● RST 11-12.3 FOLLOW PRECISELY A COMPLEX MULTISTEP PROCEDURE WHEN CARRYING OUT EXPERIMENTS, TAKING MEASUREMENTS, OR PERFORMING TECHNICAL TASKS; ANALYZE THE SPECIFIC RESULTS BASED ON EXPLANATIONS IN THE TEXT. ● RST.11-12.4 DETERMINE THE MEANING OF SYMBOLS, KEY TERMS, AND OTHER DOMAIN-SPECIFIC WORDS AND PHRASES AS THEY ARE USED IN A SPECIFIC SCIENTIFIC OR TECHNICAL CONTEXT RELEVANT TO GRADES 11-12 TEXT AND TOPICS ● RST.11-12.7 INTEGRATE AND EVALUATE MULTIPLE SOURCES OF INFORMATION PRESENTED IN DIVERSE FORMATS AND MEDIA (E.G. QUANTITATIVE DATA, VIDEO, MULTIMEDIA) IN ORDER TO ADDRESS A QUESTION OR SOLVE A PROBLEM. ● RST11-12.8 EVALUATE THE HYPOTHESIS, DATA, ANALYSIS AND CONCLUSIONS IN A SCIENCE OR TECHNICAL TEXT, VERIFYING THE DATA WHEN POSSIBLE AND CORROBORATING OR CHALLENGING CONCLUSIONS WITH OTHER SOURCES OF INFORMATION		● <i>Use systems thinking</i> ● <i>solve problems</i>

- **RST.11-12.9** SYNTHESIZE INFORMATION FROM A RANGE OF SOURCES (E.G. TEXTS, EXPERIMENT, SIMULATIONS) INTO A COHERENT UNDERSTANDING OF A PROCESS, PHENOMENON, OR CONCEPT, RESOLVING CONFLICTING INFORMATION WHEN POSSIBLE.
 - **WHST 11-12.2** WRITE INFORMATIVE/ EXPLANATORY TEXTS INCLUDING THE NARRATION OF HISTORICAL EVENTS, SCIENTIFIC PROCEDURES/ EXPERIMENT, OR TECHNICAL PROCESSES.
 - **WHST.11-12.7** CONDUCT SHORT AS WELL AS MORE SUSTAINED RESEARCH PROJECTS TO ANSWER A QUESTION (INCLUDING A SELF-GENERATED QUESTION) OR SOLVE A PROBLEM; NARROW OR BROADEN THE INQUIRY WHEN APPROPRIATE; SYNTHESIZE MULTIPLE SOURCES ON THE SUBJECT; DEMONSTRATING UNDERSTANDING OF THE SUBJECT UNDER INVESTIGATION
 - **WHST.11-12.9** DRAW EVIDENCE FROM INFORMATIONAL TEXTS TO SUPPORT ANALYSIS, REFLECTION AND RESEARCH.

Stage 2 - Evidence	
<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	PERFORMANCE TASK(S):
	OTHER EVIDENCE:

Stage 3 – Learning Plan	
Summary of Key Learning Events and Instruction	
<i>Language Arts Integration</i>	<i>Mathematics Integration</i>
1.OA.1 Use	1.OA.1 Use
<i>Technology Integration</i>	<i>District Materials</i>
1.OA.1 Use	
<i>Science and Engineering Practices</i>	
S&EP 1. Asking questions and defining problems S&EP 2. Developing and using models	

S&EP 3. Planning and carrying out investigations S&EP 4. Analyzing and interpreting data S&EP 5. Using mathematics and computational thinking S&EP 6. Constructing explanations (for science) and designing solutions (for engineering) S&EP 7. Engaging in argument from evidence S&EP 8. Obtaining, evaluating and communicating information	
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