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| <b>Course Title:</b> | Forensics |
| <b>Grade(s):</b>     | 9-12      |

| Course Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| Forensic science is the application of scientific methods and processes to matters that involve crime or the public. This course focuses on various aspects of forensic science and modern criminal investigation analysis. The study of forensics focuses on problem solving, with an emphasis on writing, using experimentation, theorization, research methodologies and evidence-based conclusions. Students will write reports that record their results, conclusions and analyses of case studies and investigations. Topics in forensic science may include ballistics, forensic DNA analysis, fingerprint, footprint and trace evidence interpretation, explosive incident and arson investigation. This is a half-year elective science course. |
| Approved Curricular Materials/Textbook(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Forensics Science, Fundamentals &amp; Investigations</i> by Anthony J. Bertino                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Unit Title          | Unit Description (Include Unit Objectives)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Unit Pacing |
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| Unit 1: Observation | <p>In this unit, students will explore the science and psychology behind human observation and its critical role in forensic investigations. The unit begins by defining <i>observation</i> and examining the neurological processes that occur in the brain when we take in and interpret information. Students will investigate how perception is shaped by attention, memory, and cognitive shortcuts, and how these processes can both help and hinder accurate recall.</p> <p>Learners will analyze real-world examples of factors that influence eyewitness accounts, including stress, environmental conditions, personal biases, and the presence of weapons or distractions. By comparing eyewitness testimony to documented facts from controlled scenarios and case studies, students will evaluate the strengths and limitations of human memory in forensic contexts.</p> <p>Throughout the unit, students will connect observation skills to their applications in</p> | 11 days     |

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|                     | <p>forensic science, such as crime scene analysis, evidence recognition, and investigative decision-making. Hands-on activities and structured practice will allow students to assess and improve their own observation abilities. Through reflection, discussion, and practical exercises, students will develop a deeper understanding of how observation works—and why accuracy in observation is essential to the pursuit of justice.</p> <p><i>Unit Objectives</i><br/> <i>Define observation and describe what changes occur in the brain.</i><br/> <i>Describe examples of factors influencing eyewitness accounts of events.</i><br/> <i>Compare the reliability of eyewitness testimony to what actually happened.</i><br/> <i>Relate observation skills to their use in forensic science.</i><br/> <i>Practice and improve your own observation skills.</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |         |
| Unit 2: Crime Scene | <p>In this unit, students will develop a comprehensive understanding of how crime scenes are managed, documented, and analyzed within the field of forensic science. The unit begins with an exploration of Locard's Exchange Principle, the foundational concept stating that every contact leaves a trace. Students will identify and examine examples of trace evidence, such as hair, fibers, soil, and pollen, and learn how these tiny materials can link suspects, victims, and crime scenes.</p> <p>Students will differentiate between direct evidence—such as eyewitness statements—and circumstantial evidence, which requires inference, gaining insight into the strengths and limitations of each type. To understand how a crime scene is professionally managed, students will identify the key crime-scene personnel, including first responders, forensic specialists, detectives, and medical examiners, and clarify the roles each plays in an investigation.</p> <p>A major focus of the unit is the seven steps of a crime-scene investigation, from securing and isolating the scene to the final walkthrough. Students will learn why scene security is critical to protecting evidence integrity and avoiding contamination. They will also explore the various documentation methods, including notes, photography, sketches, and video, that allow investigators to preserve a detailed and accurate record of the scene.</p> | 11 days |

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|                      | <p>Through guided practice and hands-on activities, students will demonstrate proper techniques for collecting and packaging trace evidence to maintain chain of custody and prevent degradation. Finally, the unit concludes with an overview of how evidence is analyzed in the forensic laboratory, connecting the crime scene to the scientific processes that support the justice system.</p> <p><i>Unit Objectives</i><br/> <i>Summarize Locard's exchange principle.</i><br/> <i>Identify four examples of trace evidence.</i><br/> <i>Distinguish between direct and circumstantial evidence.</i><br/> <i>Identify the type of professionals who are present at a crime scene.</i><br/> <i>Summarize the seven steps of a crime-scene investigation.</i><br/> <i>Explain the importance of securing the crime scene.</i><br/> <i>Identify the methods by which a crime scene is documented.</i><br/> <i>Demonstrate proper technique in collecting and packaging trace evidence.</i><br/> <i>Describe how evidence from a crime scene is analyzed.</i></p>                                                                                                                                                                                                                                                   |         |
| Unit 3: Fingerprints | <p>In this unit, students will explore the science, history, and modern applications of fingerprint analysis in forensic investigation. The unit begins with a study of the history of fingerprinting, tracing its development from ancient practices to its establishment as a cornerstone of modern forensic science. Students will examine the unique characteristics of fingerprints, including ridge patterns, minutiae points, and the biological factors that make each fingerprint distinct.</p> <p>Learners will identify and classify the three basic fingerprint types—loops, whorls, and arches—while also investigating how criminals have attempted to alter or obscure their fingerprints, and why such attempts are rarely successful. Through case studies and scientific evidence, students will assess the reliability of fingerprint identification, considering both its strengths and its limitations.</p> <p>A significant portion of the unit focuses on collecting fingerprint evidence, including dusting, chemical development, and digital imaging. Students will learn about cutting-edge identification technologies, such as automated fingerprint identification systems (AFIS), biometric scanners, and emerging digital enhancements that support rapid and accurate matching.</p> | 11 days |

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|              | <p>Hands-on practice will allow students to compare and evaluate prints to determine whether a fingerprint matches one on record. Students will also gain experience with the process of lifting latent prints, applying professional techniques to recover and preserve hidden fingerprints from surfaces. By the end of the unit, learners will understand both the scientific foundations and practical processes that make fingerprinting a vital tool in forensic investigation.</p> <p><i>Unit Objectives</i><br/> <i>Discuss the history of fingerprinting.</i><br/> <i>Describe the characteristics of fingerprints.</i><br/> <i>Identify the basic types of fingerprints.</i><br/> <i>Describe how criminals attempt to alter their fingerprints.</i><br/> <i>Determine the reliability of fingerprints as a means of identification.</i><br/> <i>Explain how fingerprint evidence is collected.</i><br/> <i>Describe the latest identification technologies.</i><br/> <i>Determine if a fingerprint matches a fingerprint on record.</i><br/> <i>Use the process of lifting a latent print.</i></p>                                                                                                                     |         |
| Unit 4: Hair | <p>This unit introduces students to the foundational principles and applications of forensic hair examination. Learners will begin by exploring the anatomy of hair, identifying its major components—including the medulla, cortex, and cuticle—and understanding how these structures vary across different types of hair. The unit then extends into comparative analysis, guiding students in recognizing key differences between human and nonhuman animal hair through microscopic observation and structural characteristics.</p> <p>Students will develop skills in forensic comparison, learning how to evaluate whether two hair samples are likely to have originated from the same individual by examining morphological features and patterns. They will also calculate the medullary index to support conclusions in forensic contexts. Emphasis is placed on the practical role of hair as trace evidence, helping students understand how hair contributes to crime scene investigations, including its strengths and limitations.</p> <p>Finally, the unit will address the classification of hair based on traits associated with broad racial categories, allowing students to identify population-related</p> | 11 days |

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|               | <p>variations responsibly and scientifically. By the end of the unit, learners will possess a strong foundational understanding of hair as evidence and will be able to apply analytical techniques used in forensic laboratories.</p> <p><i>Unit Objectives</i><br/> <i>Identify the various parts of a hair.</i><br/> <i>Describe variations in the structure of the medulla, cortex and cuticle.</i><br/> <i>Distinguish between human and nonhuman animal hair.</i><br/> <i>Determine if two examples of hair are likely to be from the same person.</i><br/> <i>Explain how hair can be used in a forensics investigation.</i><br/> <i>Calculate the medullary index for a hair.</i><br/> <i>Distinguish hairs from individuals belonging to the broad racial categories.</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |
| Unit 5: Fiber | <p>This unit provides students with an in-depth introduction to the forensic examination of fibers and textiles. Students will begin by identifying and describing common weave patterns, gaining an understanding of how textile construction influences the appearance and behavior of fiber evidence. Through both physical and chemical analysis, learners will compare and contrast different types of fibers—natural, synthetic, and blended—observing the distinguishing traits that aid in their forensic identification.</p> <p>A major focus of the unit is the study of the principal characteristics of common fibers, including morphology, burn behavior, chemical reactivity, and microscopic features. Students will learn how these characteristics can be used to classify unknown samples and support investigative conclusions.</p> <p>Throughout the unit, students will apply forensic science techniques such as microscopy, solubility testing, and instrumental analysis to examine fiber evidence. By the end of the unit, learners will understand the role of fibers in forensic investigations and will be able to conduct and interpret analyses with scientific accuracy.</p> <p><i>Unit Objectives</i><br/> <i>Identify and describe common weave patterns of textile samples.</i><br/> <i>Compare and contrast various types of fibers through physical and chemical analysis.</i></p> | 11 days |

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|                              | <p><i>Describe principal characteristics of common fibers used in their identification.</i></p> <p><i>Apply forensic science techniques to analyze fibers.</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |
| Unit 6: Handwriting Analysis | <p>This unit introduces students to the scientific principles and investigative techniques used in the forensic analysis of handwriting and questioned documents. Students will explore twelve key handwriting exemplars, learning how features such as line quality, spacing, letter formation, and slant are used to evaluate writing samples. They will demonstrate each of these traits through guided practice, gaining firsthand insight into how subtle variations contribute to an individual's writing style.</p> <p>The unit examines the major goals of forensic handwriting analysis, including determining authorship, identifying alterations, and detecting the presence of forgery. Students will also be introduced to the specialized technologies used in modern document examination—such as microscopes, digital imaging tools, and spectral analysis instruments—that enhance accuracy and objectivity in forensic investigations.</p> <p>In addition, learners will distinguish between forgery and fraudulence, understanding how each term applies within legal and investigative contexts. The unit also addresses real-world applications by exploring methods businesses use to prevent check forgery and by identifying four security features of paper currency commonly used to detect counterfeit bills.</p> <p>By the end of this unit, students will be able to analyze handwriting exemplars, apply forensic technology, recognize fraudulent document activity, and evaluate security features used to protect against counterfeiting.</p> <p><i>Unit Objectives</i></p> <p><i>Describe 12 types of handwriting exemplars that can be analyzed in a document.</i></p> <p><i>Demonstrate an example of each of the 12 exemplars of handwriting traits.</i></p> <p><i>Identify the major goals of a forensic handwriting analysis.</i></p> <p><i>Describe some of the technology used in handwriting analysis.</i></p> <p><i>Distinguish between the terms forgery and fraudulence.</i></p> <p><i>Identify several ways in which businesses prevent check forgery.</i></p> <p><i>Describe four features of paper currency that are used to detect counterfeit bills.</i></p> | 11 days |

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| Unit 7: Blood / Blood Spatter | <p>This unit provides students with a comprehensive introduction to the role of blood evidence in forensic science. Students begin by examining the composition of blood and the functions of its cellular components, building a biological foundation for understanding how blood behaves and why it is valuable in investigations. The unit also explores the historical development of blood and blood-spatter analysis, showing how scientific advances have shaped modern forensic techniques.</p> <p>Learners will practice methods used to determine blood type and screen for the presence of human blood, gaining experience with serological testing and presumptive assays. Students will further apply statistical reasoning by calculating the probability of blood-type occurrences within a population, learning how these probabilities support investigative conclusions.</p> <p>A major focus of the unit is bloodstain pattern analysis (BPA). Students will investigate how blood behaves under different conditions, conduct hands-on BPA activities, and learn to interpret patterns to infer the events of a crime, including the direction, angle, and force of impact. The unit also examines stab wounds, guiding learners in describing characteristics of the weapon and the dynamics of the attack based on blood evidence and wound morphology.</p> <p>By the end of the unit, students will be able to analyze blood evidence, interpret bloodstain patterns, and reconstruct elements of a crime scene with scientific reasoning and accuracy.</p> <p><i>Unit Objectives</i><br/> <i>Explain the composition of blood.</i><br/> <i>Describe the functions of blood cells.</i><br/> <i>Describe a brief history of the use of blood and blood-spatter analysis in forensics.</i><br/> <i>Describe how to determine the blood type of a sample of blood.</i><br/> <i>Describe how to screen for the presence of human blood.</i><br/> <i>Calculate the probability of certain blood types within a population.</i><br/> <i>Conduct a blood-spatter analysis.</i><br/> <i>Examine stab wounds and describe the nature of the weapon.</i><br/> <i>Use blood-spatter evidence to recreate the events at a crime scene.</i></p> | 11 days |
| Unit 8: DNA                   | This unit introduces students to the scientific foundations and investigative                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 11 days |

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| Fingerprinting | <p>applications of DNA analysis in forensic science. Students will explore how crime-scene evidence is properly collected for DNA testing, emphasizing contamination prevention, chain of custody, and sample preservation. They will then examine the steps involved in processing biological evidence to obtain DNA, including extraction, amplification, and separation techniques used in forensic laboratories.</p> <p>A key component of the unit focuses on the use of radioactive probes in traditional DNA fingerprinting, explaining how labeled DNA fragments bind to complementary sequences to create identifiable banding patterns. Students will learn how DNA profiles are compared to determine whether samples match, understanding both the biological principles and statistical considerations behind forensic interpretation.</p> <p>The unit also covers how DNA fingerprinting can be used to determine biological relationships, such as distinguishing related from unrelated individuals. Students will apply these principles to real-world scenarios by using DNA profiles to identify parents, children, or other relatives based on shared genetic markers.</p> <p>By the end of this unit, learners will understand the scientific processes behind forensic DNA analysis and be able to interpret DNA fingerprinting results to support investigative and legal conclusions.</p> <p><i>Unit Objectives</i><br/> <i>Explain how crime-scene evidence is collected for DNA analysis.</i><br/> <i>Describe how crime-scene evidence is processed to obtain DNA.</i><br/> <i>Describe how radioactive probes are used in DNA fingerprinting.</i><br/> <i>Explain how DNA evidence is compared for matching.</i><br/> <i>Explain how DNA fingerprinting is used to determine if specimens come from related or unrelated individuals.</i><br/> <i>Explain how to use DNA fingerprinting to identify DNA from a parent, child or relative of another person.</i></p> |  |
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