History of Forensic Science/Crime Scene

Content Area: **Science**
Course(s): **Introduction to Forensic Investigations**
Time Period: **First Marking Period**
Length: **2 Weeks**
Status: **Published**

Unit Overview

In this unit students will be exposed to the fundamentals of forensic science and the process a potential suspect has to go through. They will explore historical figures and events that shaped the careers of forensic science. There are specific protocol to follow to document, secure and process a crime scene and the evidence that is found there. Students will learn that forensic science is all about the details and documentation.

STAGE 1- DESIRED RESULTS

Standards- 2020 New Jersey Student Learning Standards- Science

SCI.9-12.HS-LS3-1	Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.
SCI.9-12.HS-LS3-3	Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.
SCI.9-12.HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

Science and Engineering Practices

- Analyzing and Interpreting Data
- Asking Questions and Defining Problems
- Constructing Explanations and Designing Solutions
- Developing and Using Models
- Engaging in Argument from Evidence
- Obtaining, Evaluating, and Communicating Information
- Planning and Carrying Out Information
- Using Mathematics and Computational Thinking

Cross Cutting Concepts

- Cause and Effect
- Energy and Matter
- Influence of Engineering, Technology, and Science on Society and the Natural World
- Interdependence of Science, Engineering, and Technology
- Patterns
- Scale, Proportion, and Quantity
- Stability and Change
- Structure and Functions
- Systems and System Models

Disciplinary Core Ideas

Physical Sciences

Life Sciences

- LS1D: Information Processing

Earth and Space Sciences

Engineering. Technology. and Applications of Science

- ETS1B: Developing Possible Solutioins
- ETS1C: Optimizing the Design Solution

Essential Questions

How has science become integrated into the practice of law?

How do fictitious portrayals of forensic science compare to real-world forensic science?

Why must a crime scene be secured and processed in a methodical and procedural manner?

Why are different types of evidence important in a crime scene?

How is the location and handling of evidence essential to crime scene investigation?

Enduring Understanding

Forensic science relates the application of scientific knowledge to legal questions and involves a variety of careers.

Observation skills are extremely important in forensic science, especially when processing a crime scene.

There are different types of evidence found at a crime scene that can be used to reconstruct the events of a crime.

Students will know...

Vocabulary - analytical skills, deductive reasoning, eyewitnesses, fact, forensic, logical, observations, opinion, perception, chain of custody, circumstantial evidence, class evidence, crime scene investigation & reconstruction, datum point, direct evidence, first responder, individual evidence, paper bindle, primary crime scene, secondary crime scene, trace evidence, triangulation

Misconceptions - information at crime scenes must be gathered in a systematic way, validity of eyewitness testimony, importance of observations at a crime scene

Students will be able to...

Analyze the differences between the perceived and actual roles of forensic scientists.

Interpret how the scientific method is used in forensic science.

Follow procedures while investigating a crime scene.

Compare and classify different types of evidence.

STAGE 2- EVIDENCE OF LEARNING

Formative Assessment

- 3- Minute Pause
- Analogy Prompt
- Choral Response
- Debriefing
- Exit Card / Ticket
- Index Card Summaries
- Journal Entry
- Misconception Check
- Observation
- Questions & Answers
- Quiz
- Self-Assessment
- Student Conference
- Think-Pair-Share
- Web or Concept Map

Authentic Assessments

Observation Activity

Sketching the Crime Scene

Innocence Project

Forensic Files Analysis of Crime Scene Video

Locard's Principle of Exchange Lab

Benchmark Assessments

Unit test on Introduction to Forensic Science and the Crime Scene

STAGE 3- LEARNING PLAN

Instructional Map

Observation Skills

Deductive Reasoning

Careers in Forensic Science

Types of Evidence

7 S's of Crime Scene Investigation

Locard's Exchange Principle

Analyzing the Crime Scene

Modification/Differentiation of Instruction

Differentiation Strategies for Special Education Students

- Remove unnecessary material, words, etc., that can distract from the content
- Use of off-grade level materials
- Provide appropriate scaffolding
- Limit the number of steps required for completion
- Time allowed
- Level of independence required
- Tiered centers, assignments, lessons, or products
- Provide appropriate leveled reading materials
- Deliver the content in "chunks"
- Varied texts and supplementary materials
- Use technology, if available and appropriate
- Varied homework and products
- Varied questioning strategies
- Provide background knowledge
- Define key vocabulary, multiple-meaning words, and figurative language.
- Use audio and visual supports, if available and appropriate
- Provide multiple learning opportunities to reinforce key concepts and vocabulary
- Meet with small groups to reteach idea/skill
- Provide cross-content application of concepts
- Ability to work at their own pace
- Present ideas using auditory, visual, kinesthetic, & tactile means
- Provide graphic organizers and/or highlighted materials
- Strategy and flexible groups based on formative assessment
- Differentiated checklists and rubrics, if available and appropriate

Differentiation Strategies for Gifted and Talented Students

- Increase the level of complexity
- Decrease scaffolding
- Variety of finished products
- Allow for greater independence
- Learning stations, interest groups
- Varied texts and supplementary materials
- Use of technology
- Flexibility in assignments
- Varied questioning strategies
- Encourage research
- Strategy and flexible groups based on formative assessment or student choice
- Acceleration within a unit of study
- Exposure to more advanced or complex concepts, abstractions, and materials
- Encourage students to move through content areas at their own pace
- After mastery of a unit, provide students with more advanced learning activities, not more of the same

activity
- Present information using a thematic, broad-based, and integrative content, rather than just single-subject areas

Differentiated Strategies for ELL Students

- Remove unnecessary materials, words, etc., that can distract from the content
- Provide appropriate scaffolding
- Limit the number of steps required for completion
- Gradually increase the level of independence required
- Tiered centers, assignments, lessons, or products
- Provide appropriate leveled reading materials
- Deliver the content in "chunks"
- Varied texts and supplementary materials, including visuals
- Use technology, if available and appropriate
- Differentiate homework and products
- Varied questioning strategies
- Provide background knowledge
- Define key vocabulary, multiple-meaning words, and figurative language.
- Use audio and visual supports, if available and appropriate
- Provide multiple learning opportunities to reinforce key concepts and vocabulary
- Meet with small groups to reteach idea/skill
- Provide cross-content application of concepts
- Allow students to work at their own pace
- Presenting ideas through auditory, visual, kinesthetic, & tactile means
- Role play
- Provide graphic organizers, highlighted materials
- Strategy and flexible groups based on formative assessment

Differentiation Strategies for At Risk Students

- Remove unnecessary materials, words, etc., that can distract from the content
- Provide appropriate scaffolding
- Limit the number of steps required for completion
- Gradually increase the level of independence required
- Tiered centers, assignments, lessons, or products
- Provide appropriate leveled reading materials
- Deliver the content in "chunks"
- Varied texts and supplementary materials
- Use technology, if available and appropriate
- Differentiate homework and products

- Varied questioning strategies
- Provide background knowledge
- Define key vocabulary, multiple-meaning words, and figurative language
- Use audio and visual supports, if available and appropriate
- Provide multiple learning opportunities to reinforce key concepts and vocabulary
- Meet with small groups to reteach idea/skill
- Provide cross-content application of concepts
- Presenting ideas through auditory, visual, kinesthetic, & tactile means
- Provide graphic organizers and/or highlighted materials
- Strategy and flexible groups based on formative assessment

504 Plans

Students can qualify for 504 plans if they have physical or mental impairments that affect or limit any of their abilities to:

- walk, breathe, eat, or sleep
- communicate, see, hear, or speak
- read, concentrate, think, or learn
- stand, bend, lift, or work

Examples of accommodations in 504 plans include:

- preferential seating
- extended time on tests and assignments
- reduced homework or classwork
- verbal, visual, or technology aids
- modified textbooks or audio-video materials
- behavior management support
- adjusted class schedules or grading
- verbal testing
- excused lateness, absence, or missed classwork
- pre-approved nurse's office visits and accompaniment to visits
- occupational or physical therapy

Modification Strategies

- Cooperative Grouping
- Extended Time
- Frequent Breaks
- Highlighted Text
- Modified Test
- Oral Directions
- Peer Tutoring
- Preferential Seating
- Re-direct
- Repeated Drill and Practice
- Teacher Notes
- Tutorials
- Use of Additional Reference Materials
- Use of Audio Resources

Differentiation Strategies

High Preparation

- Alternative Assessments
- Games and Tournaments
- Group Investigations
- Guided Reading
- Independent Research / Project
- Interest Groups
- Leveled Rubrics
- Multiple Texts
- Project Based Learning (PBL)
- Stations / Centers
- Tiered Activities / Assignments
- Varying Graphic Organizers

Low Preparation

- Choice of Book / Activity
- Exploration by Interest (using interest inventories)

- Flexible Grouping
- Goal Setting With Student
- Homework Options
- Jigsaw
- Open-ended Activities
- Think-Pair-Share by Readiness, Interest, or Learning Style
- Use of Collaboration
- Use of Reading Buddies
- Varied Product Choice
- Varied Supplemental Materials
- Work Alone / Together

Horizontal Intergration- Interdisciplinary Connections

See Appendix

Vertical Integration- Discipline Mapping

Middle School Science - Diversity of Life, Populations and Ecosystems, Human Systems Interactions, and Heredity and Adaptations

High School Science (Biology, Chemistry, Anatomy & Physiology) - Reading and analyzing scientific research data

Additional Materials

Forensic Science Fundamentals and Investigations - Bertino & Bertino
History of Forensic Science: www.crimezzz.net/forensic_history
Criminal Fact Investigation Index: www.tncrimlaw.com/forensic/fsbindx
Forensic History Timeline: http://forensicsciencecentral.co.uk
History timeline CBS TV: www.cbsnews.com/htdocs/forensics/timeline
Crime scene investigation protocol: www.nij.gov/topics/law-enforcement/investigations/crime-scene
TED Talks - Problem with eyewitness testimony
PBS - How reliable is the science behind forensics