

Death Scene Investigation

Content Area: **Science**
 Course(s): **Introduction to Forensic Investigations**
 Time Period: **Second Marking period**
 Length: **5 Weeks**
 Status: **Published**

Unit Overview

Death investigation in the United States consists of federal standards and national regulation of the process or of those conducting the investigations. In this unit, students will not only understand the guidelines followed in the investigation of death scenes but will also be able to recreate a death scene in the classroom. By recreating a death scene and following the guidelines to solve the crime students will understand the process of death scene investigation and the role of various investigators in solving a death/crime.

STAGE 1- DESIRED RESULTS

Standards- 2020 New Jersey Student Learning Standards- Science

SCI.9-12.HS-PS1-5	Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.
SCI.9-12.HS-LS1-1	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
SCI.9-12.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
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

- PS1B: Chemical Reactions

Life Sciences

- LS1A: Structure and Functions
- LS1B: Growth and Development of Organisms
- LS1C: Organization for Matter and Energy Flow in Organisms
- LS1D: Information Processing

Earth and Space Sciences

Engineering, Technology, and Applications of Science

- ETS1B: Developing Possible Solutions

- ETS1C: Optimizing the Design Solution

Essential Questions

- How are the manner, mechanism, cause and time of death determined ?
- What can be determined by analyzing and examining a corpse that could be useful for determining the cause of death ?

Enduring Understanding

- Evidence collected from the body both at a crime scene and during an autopsy can only allow an estimate of a postmortem interval.
- Examining a dead body would reveal what findings were due to factors that occurred before death and what findings are caused by normal decomposition or damage after death.

Students will know...

Vocabulary - algor mortis, autolysis, autopsy, cause of death, coroner, decomposition, livor mortis, manner of death, mechanism of death, medical examiner, putrefaction, rigor mortis

Misconceptions - death is a process that occurs gradually, there is a universal definition of death

Students will be able to...

- Identify the characteristics of human remains that are most useful in forensic comparisons.
- Demonstrate procedures used by the forensic scientist when processing human remains.

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

- Written tests and quizzes
- Worksheets
- Lab/ Activity
- Project Assessments
- Research activities such as "The Body Farm" and Dr.Bill Bass, the work of Clyde snow
- Famous Case Study to research such as: The Romanovs
- Famous case study to research such as: John Wayne Gacy
- Webquests such as: www.hbo.com/autopsy

Benchmark Assessments

Chapter Test on Death Scene Investigation

STAGE 3- LEARNING PLAN

Instructional Map

Textbook: Forensic Science: Fundamentals and Investigations. 2nd edition by Bertino and Bertino. Published by Cengage Learning, 2016

Class notes via lecture, Powerpoint, Smartboard, overhead projector, and class discussion

Video such as: Dr.Baden video series "Autopsy"

Hands-on activities and cooperative group work such as: comparison of insect larvae/adult species, comparison of "stomach contents" from different "victims" calculating time of death using rigor, algor, and livor mortis data

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 Biology and Human Anatomy - Understanding the relationship between cessation of blood, heart activity, brain activity, stopping of breathing to the cessation of life.

Additional Materials

Web resources:

1. Assignment on Death scene investigation : <http://www-tc.pbs.org/wgbh/pages/frontline/teach/post-mortem/post-mortem.pdf>The National Association of High School Teachers of Forensic Science: <http://www.hstofs.org/>
2. The Virtual Autopsy: <http://www.le.ac.uk/pathology/teach/va/titlpag1.html>
3. Forensic Views of the Body: <http://www.nlm.nih.gov/visibleproofs/index.html>
4. American Academy of Forensic Sciences: <http://aafs.org/>
5. <http://www.andreacampbell.com/html/email.html>
6. Online Crime: <http://www.crimescene.com/>
7. Quick Mysteries to Solve: <http://www.mysterynet.com/>