Health Science & Biomedical Program of Study

INTEGRATED CURRICULUM UNIT ON FORENSICS

Crime Scene Investigation

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UNIT OVERVIEW

Essential Question for This Unit

What are the appropriate roles for scientific technology and human judgment in arriving at verdicts in criminal cases?

Unit Summary

In this unit, students take on the role of crime scene investigators to solve a murder that has occurred at the school. They will integrate math, science, and language arts into the study of forensic science and associated health science careers such as pathology, forensic science, and medical examination.

In Subunit 1, students are introduced to the unit and the task of crime scene investigation. They will read and analyze a classic mystery, *The Blue Carbuncle*. Students will also learn about the techniques of various branches of forensic science and how advances in biotechnology have helped to solve crimes.

In Subunit 2, students will learn and apply the various techniques used during a crime scene investigation, including what types of evidence to collect and how that evidence can be used to deduce information about the crime and/or perpetrator. In this unit, students will learn such investigative strategies as measuring stride length from footprints left at the scene to calculate height; using the victim's temperature to estimate the time of death; and collecting blood and other DNA samples from the scene in order to conduct a variety of biological tests—including blood typing and DNA fingerprinting that can match a suspect to the crime.

In Subunit 3, students examine the results of forensic science. In World History, they examine how forensic science has been used not only to solve individual crimes, but also to shed light on crimes against humanity. In English Language Arts, students interview professionals engaged in various aspects of forensic science. They also will marshal the evidence from their own investigations into a case against the primary suspect. Students will write up their arguments, as well as present them orally.

Culminating Event

Because this unit focuses on solving a crime, the most logical culminating event would be to conduct a trial. Some students can assume the role of lawyers, preparing opening and closing statements that summarize the strengths and weaknesses of the case and the evidence. Other students can assume the role of police officers and scientific experts called as witnesses to testify.

Key Questions/Issues

- What tales can dead men tell? What can you learn about a crime by examining the victim? (Health Science I, Biology, Algebra I and II, Geometry)
- What kinds of clues and evidence can be gleaned from a crime scene? What types of evidence are left behind? (Health Science I)
- What factors and evidence should be used to determine a person's guilt? Is some evidence better or worse than others? (Health Science I, English Language Arts)
- Should circumstantial evidence play a role? Why or why not? (English Language Arts, Health Science I, World History)
- Why take the temperature of a dead body? (Algebra II)
- How have advances in DNA technology helped to ensure justice is being served? (Biology)
- Should juries rely solely on DNA evidence in determining the guilt of accused individuals in capital murder cases? How reliable is DNA evidence? (English Language Arts, Health Science I)

Learning Scenario to Kick Off the Unit

A young man has been found dead in an unused classroom with a knife stuck in his chest. A group of three students found the body this morning. The deceased was on his back when discovered, and the room was in a little bit of disarray, chairs turned over and desks shoved out of place. Bloody footprints and the murder weapon were left at the scene!

Everyone in school is shocked and wondering what happened. When the name of the victim is released, it turns out that he was a former student who graduated last year, and not a very popular one at that! He had a history of trouble with teachers, administrators, and other students—probably with others as well—so the list of suspects might be very long. When the police arrive, the crime scene investigators go to take a look at the scene. What will the police be doing to solve the crime and to ensure that they have the right perpetrator?

Biomedical/Healthcare and Education Partner Roles

- Forensic scientists from the local community can be invited to speak to students in greater depth about their job and training.
- Students can visit local hospitals or other medical facilities with pathology labs.

SUBUNITS AND MAJOR TOPICS (ACROSS ACADEMIC AND TECHNICAL SUBJECT AREAS)

Subunit 1 *Murder Most Foul*	**Subunit 2** *Crime Scene Investigations*	**Subunit 3** *Convincing the Jury*
HEALTH SCIENCE I · ENGLISH LANGUAGE ARTS	**ALGEBRA I · ALGEBRA II · BIOLOGY · GEOMETRY · HEALTH SCIENCE I**	**ENGLISH LANGUAGE ARTS · WORLD HISTORY**
• Careers in forensic science • Techniques of forensic science • Literary analysis including identifying or inferring the central idea, purpose, or theme and identifying literary devices and techniques, particularly those associated with mysteries • Reasoning and problem solving	• Ratios and proportions • Linear equations • Graphing the equation of a circle • Deriving from the distance formula • Logarithmic equations–Newton's Law of Cooling • DNA structure and purpose • Blood typing • DNA fingerprinting • Gel electrophoresis	• Investigation of war crimes and crimes against humanity • Aftermath of World War II and the Nuremberg Trials • Persuasive composition writing with structured arguments • Delivery of persuasive arguments using rhetorical devices to support assertions