

05-DNA Evidence

Content Area: **Science**
Course(s):
Time Period: **Full Year**
Length: **3 weeks**
Status: **Published**

General Overview, Course Description or Course Philosophy

In this course, you will apply the science you've learned throughout your high school years in a variety of ways to analyze and solve cases. Various aspects of chemistry, physics, biology and physiology, to name a few, will be utilized with this course. Many of the activities will be lab-base, as this course is an applied science course. This course should prove to be intriguing, through provoking and have a "gross-factor" that should keep you entertained!

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Students will understand that: a DNA match is the most incriminating evidence that a forensic scientist can find. Students will review the history, structure, and replication of DNA. Then, students will discuss how to collect DNA evidence and experimentally test different methods of DNA typing.

CONTENT AREA STANDARDS

LA.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.
LA.RST.11-12.8	Evaluate the hypotheses, 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.
LA.RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
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-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.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

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LA.RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

STUDENT LEARNING TARGETS

Refer to the 'Declarative Knowledge' and 'Procedural Knowledge' sections.

Declarative Knowledge

Students will understand that:

- outline a brief history of DNA
- introduce Fry vs. U.S and Daubert vs. Dow as important cases that influence forensic law
- use a variety of vocabulary associated with DNA and heredity
- describe the structure of DNA and its replication
- discuss how DNA evidence can be extracted from a crime scene
- discuss use of mtDNA as evidence

Procedural Knowledge

Students will be able to:

- compare numerous methods of DNA typing
- determine if DNA evidence can be used as individualistic evidence

EVIDENCE OF LEARNING

Refer to the 'Formative Assessments' and 'Summative Assessments' sections.

Formative Assessments

observation exercises

do know

exit/entrance tickets

quizzes

homework

Summative Assessments

- Benchmarks – departmental benchmark given at the end of MP1, MP2, and MP3 based on lab practices
- Alternative Assessments
 - Lab inquiries and investigations
 - Lab Practicals
 - Exploratory activities based on phenomenon
 - Gallery walks of student work
 - Creative Extension Projects
 - Build a model of a proposed solution
 - Let students design their own flashcards to test each other
 - Keynote presentations made by students on a topic
 - Portfolio

RESOURCES (Instructional, Supplemental, Intervention Materials)

American Academy of Forensic Science (aafs.org/students/choosing-a-career/)

American Forensic Association (americanforensics.org/what.html)

NY Times Forensics Articles (nytimes.com/topic/subject/forensic-science)

Forensic Files (youtube.com/user/ForensicFilesChannel)

Forensic Science Experiments

(thehomescientist.com/forensics/Illustrated_Guide_to_Home_Forensic_Science_Experiments.pdf)

INTERDISCIPLINARY CONNECTIONS

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.