International Baccalaureate
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Marietta City Schools

2025-26 District Unit Planner

MARIETTA CITY SCHOOLS

Grade & Course: Forensic Science	**Topic:** Unit 6 Biological Evidence- DNA Profiling	**Duration:** 4 weeks
Teachers: Forensic PLC Teachers		

Georgia Standards and Content:
SFS3. Obtain, evaluate, and communicate information relating to biological evidence in forensic investigations.
e. Plan and carry out an investigation involving DNA processing and analysis.

Narrative / Background Information

Prior Student Knowledge: (REFLECTION – PRIOR TO TEACHING THE UNIT)
Students should have background knowledge from biology about DNA and gel electrophoresis. Students should also be able to differentiate between latent fingerprints and DNA fingerprinting.

Year-Long Anchoring Phenomena: (LEARNING PROCESS)
An unidentified body was found in an abandoned Connex container in a shipping yard.

Unit Phenomena (LEARNING PROCESS)
In 1984, a boy named Andrew was not allowed to return to his country until his identity was proven through DNA analysis.

Inquiry Statement:
As technology advances, forensics scientists are able to analyze smaller and smaller biological samples to develop a DNA profile.

Global Context:
Scientific and Technical Innovation

Science & Engineering Practices:
- Planning and Carrying Out An Investigation

Disciplinary Core Ideas: (KNOWLEDGE & SKILLS)
- History of DNA profiling
- Characteristics of Blood and DNA profiling
- Collection and preservation of DNA evidence
- Forensic analysis of DNA

Crosscutting Concepts: (KNOWLEDGE & SKILLS)
- Patterns

Key and Related Concepts:
- Communication
- Patterns

Possible Preconceptions/Misconceptions: (REFLECTION – PRIOR TO TEACHING THE UNIT)
Students may think that fingerprinting and DNA fingerprinting are the same thing. Students may also believe that DNA can be found at every crime scene and is always conclusive which is not accurate.

Key Vocabulary: (KNOWLEDGE & SKILLS)
Allele
Chromosome
Combined DNA Index System (CODIS)
DNA
DNA phenotyping
DNA profile (fingerprint)
DNA profiling
Electrophoresis
Exon
Familial searching
Forensic genealogy
Gene
Human genome

Homologous chromosomes
Intron
Karyotype
Kinship
Nucleotide
Polymer
Polymerase chain reaction (PCR)
Polymorphism
Primer
Short Tandem Repeats (STRs)
Single nucleotide polymorphisms (SNPs)
STR markers

Inquiry Questions:

Factual -

What is DNA fingerprinting?

What is Gel Electrophoresis?

What is PCR and STR?

What is the structure and function of DNA?

Conceptual –

How are Gel Electrophoresis, PCR, and STR used as analytical tools in crime scene investigation?

How can DNA be used in personal identification?

How do we properly collect, document, and process DNA evidence?

How have advances in DNA analysis contributed to faster and more reliable results in personal identification?

How do you extract DNA from a sample of living tissue?

How do you determine which suspect should be included or excluded based on a DNA profile?

Can your DNA be taken without your consent? If so, how?

Debatable -

What is your opinion? Does familial searching data need to be protected?

		Summative assessment

Unit Objectives:

Learning Activities and Experiences	Inquiry & Obtain: (LEARNING PROCESS)	Evaluate: (LEARNING PROCESS)	Communicate: (LEARNING PROCESS)
Week 1:	**Phenomenon:** In 1984, a boy named Andrew was not allowed to return to his country until his identity was proven through DNA analysis. DNA profiling notes DNA extraction lab	Finish DNA profiling notes PCR Lab Set-Up & Run- Day 1	PCR Data Analysis- Day 2 Class Lab Discussion

Week 2:	DNA Gel Electrophoresis Hands-On Lab- Day 1 (Set-Up) Gel Electrophoresis Online Lab	Gel Electrophoresis Hands-On Lab Day 2 (Analyze Results) DNA Fingerprinting and Paternity Activity Class Lab Discussion	
Week 3:	STR Analysis Activity	Review DNA Profiling	DNA Profiling Closer Quiz

Resources (hyperlink to model lessons and/or resources):

- Textbook Forensic Science Bertino & Bertino, 3rd Edition
- Forensic Science Schoology Course
- Additional resources can be found in the common Schoology group under the Unit 5 folder.

Reflection: Considering the planning, process and impact of the inquiry

Prior to teaching the unit	During teaching	After teaching the unit
Scaffolding and extension activities have been added as some students may remember the information well from Biology and some may not remember at all.	(click here)	(click here)