



Township of Ocean Schools

Assistant Superintendent
Office of Teaching and Learning

SPARTAN MISSION:

Meeting the needs of all students with a proud tradition of academic excellence.

Curriculum Development Timeline

School: Ocean Township High School

Course: Forensic Science

Department: Science

Board Approval	Supervisor	Notes
July 2012	Patrick Sullivan	Born Date
August 2013	Patrick Sullivan	Update Standards
December 2017	Patrick Sullivan	Update Standards
August 2018	Patrick Sullivan	Revisions

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Timeline	
Week	Marking Period 1
1	Observation Skills
2	Crime-Scene Investigation & Evidence Collection
3	Crime-Scene Investigation & Evidence Collection
4	The Study of Hair
Week	Marking Period 2
1	A Study of Fibers and Textiles
2	Fingerprints
3	DNA Fingerprinting
4	Handwriting Analysis, Forgery, and Counterfeiting
Week	Marking Period 3
1	Blood and Blood Spatter
2	Death: Meaning, Manner, Cause, and Time
3	Death: Meaning, Manner, Cause, and Time
4	Drug Identification and Toxicology
Week	Marking Period 4
1	Forensic Anthropology: What We Learn from Bones
2	Casts and Impressions
3	Ballistics
4	Final Exam Project

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Time Frame	1 week
Topic	
Observation Skills	
Essential Questions	
<ul style="list-style-type: none">• What is the importance of laboratory safety?• What is a forensic scientist's role when called to a court of law?• How do emotions affect our mental state when we are observing something?• What was the main conclusion of the Innocence Project?• What are some ways to improve our observational skills?	
Enduring Understandings	
<ul style="list-style-type: none">• The brain can alter information taken in through the senses.• Forensic scientists find, examine, and evaluate evidence by utilizing observation skills.	
Alignment to Standards	
<ul style="list-style-type: none">• HS-ETS1-3.• LA.11-12.RH.11-12.3	
Key Concepts and Skills	
<ul style="list-style-type: none">• Define observation and describe what changes occur in the brain.• Describe examples of factors influencing eyewitness accounts of events.• Compare the reliability of eyewitness testimony to what actually happened.• Relate observation skills to their use in forensic science.• Define forensic science.• Practice and improve your own observation skills.	
Learning Activities	
Activities	
<ul style="list-style-type: none">• Lecture and classroom discussion• Current Event Articles• Hands-On Observation Activities – Learning to See – observe photos for a short period of time and answer questions, Jane's Restaurant observation activity• Cooperative learning /Problem solving – Deductive Reasoning lab, Death of Lodger• Case Studies –Innocence Project cases	

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Assessments

- Labs
- Benchmark Assessment
- Formative Assessments
- Tests
- Inquiry Based Activities
- Summative Assessment

21st Century Skills

X	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
X	Life & Career Skills	X	Information Technology	X	Media Literacy		

Interdisciplinary Connections

- Social Studies: All lecture/discussions require the historical development of the specific topic being studied.
- Language Arts: Students will identify concepts learned in class & use writing skills to apply them to case studies.

Technology Integration

- PowerPoint Presentations
 - Data Projector
 - Elmo Incorporation
 - DVD
 - YouTube Content Shorts/CSI/Forensic Files Episodes
 - Google Drive/Classroom
- 8.1 Educational Technology- All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.

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Time Frame	2 weeks
Topic	
Crime-Scene Investigation and Evidence Collection	
Essential Questions	
<ul style="list-style-type: none">• What are the implications in analyzing evidence relative to Locard’s Exchange Principle?• What are some examples of trace evidence?• What are the various types of evidence?• Why is it important to “separate the witnesses” at the crime scene?• What procedures are required when collecting evidence from a crime scene?• What are the essential elements of a crime scene sketch?	
Enduring Understandings	
<ul style="list-style-type: none">• Crime scenes must be processed in a procedural manner.• Evidence is needed to determine the method by which a crime has been committed.	
Alignment to Standards	
<ul style="list-style-type: none">• HS-ETS1-3.• VPA.1.3.12.C.CS2• TECH.8.1.12.C.CS2	
Key Concepts and Skills	
<ul style="list-style-type: none">• Describe Locard’s exchange principle.• Identify four examples of trace evidence.• Distinguish between direct and circumstantial evidence.• Identify the type of professionals who are present at a crime scene.• Summarize the seven steps of a crime-scene investigation.	

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- Explain the importance of securing the crime scene.
- Identify the methods by which a crime scene is documented.
- Demonstrate proper technique in collecting and packaging trace evidence.
- Describe how evidence from a crime scene is analyzed.

Learning Activities

Activities

- Lecture and classroom discussion
- Computer Research projects
- Current Event Articles
- Lab Activities such as: creating a crime scene for students to process, Bertillion Measurement Activity
- Cooperative learning – evidence skits, CSI Team Presentations
- Case Studies-class discussion of evidence classification, processing procedures

Assessments

- Quizzes
- Formative Assessments
- Tests
- Lab activities
- Webquests
- Summative Assessment

21st Century Skills

X	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
X	Life & Career Skills	X	Information Technology	X	Media Literacy		

Interdisciplinary Connections

- Math: Measurement skills
- Social Studies: All Lecture/Discussions require the historical development of the specific topic being studied.
- Language Arts: Students will identify concepts learned in class & use writing skills to apply them to Case Studies-class discussion of evidence classification, processing procedures.

Technology Integration

- PowerPoint Presentations

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- Data Projector
- Elmo Incorporation
- DVD
- YouTube Content Shorts/CSI/Forensic Files Episodes
- Google Drive/Classroom

Time Frame	1 week
Topic	
The Study of Hair	
Essential Questions	
<ul style="list-style-type: none">• Why is hair considered class evidence?• What is the structure of hair?• How are the parts of a hair used for various forensic investigations?	
Enduring Understandings	
<ul style="list-style-type: none">• Evidence is needed to determine the method by which a crime has been committed.• Hair can be analyzed chemically and with a microscope for visual characteristics.	
Alignment to Standards	
<ul style="list-style-type: none">• HS-ETS1-3.• TECH.8.1.12.A.CS1	
Key Concepts and Skills	
<ul style="list-style-type: none">• Identify the various parts of a hair.• Describe variations in the structure of the medulla, cortex, and cuticle.• Distinguish between human and nonhuman animal hair.• Determine if two examples of hair are likely to be from the same person.	

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- Explain how hair can be used in a forensic investigation.
- Calculate the medullary index for a hair.
- Distinguish hairs from individuals belonging to the broad racial categories.

Learning Activities

Activities

- Lecture and classroom discussion
- Computer Research projects
- Current Event Articles
- Lab Activities such as: Microscopic Examination of Hair, Hair identification of various animal sources using microscopy
- Cooperative learning – problem solving – Solve a crime by analyzing hair evidence
- Case Studies-class discussion of evidence classification, processing procedures
- Webquests

Assessments

- Quizzes
- Formative Assessments
- Lab Activities

21st Century Skills

X	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
X	Life & Career Skills	X	Information Technology	X	Media Literacy		

Interdisciplinary Connections

- Math: Lab skills-Calculating Magnification
- Social Studies: All Lecture/Discussions require the historical development of the specific topic being studied.
- Language Arts: Students will identify concepts learned in class & use writing skills to apply them to Case Studies-class discussion of evidence classification, processing procedures.

Technology Integration

- PowerPoint Presentations
- Data Projector
- Elmo Incorporation
- DVD

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- YouTube Content Shorts/CSI/Forensic Files Episodes
- Google Drive/Classroom
- Microscope

Time Frame	1 week
Topic	
A Study of Fibers and Textiles	
Essential Questions	
<ul style="list-style-type: none">• Why are fibers an excellent source of trace evidence?• How do natural fibers differ from synthetic fibers?• How is fiber evidence gathered?• How are fibers identified?	
Enduring Understandings	
<ul style="list-style-type: none">• Evidence is needed to determine the method by which a crime has been committed.• Fiber evidence can be used in forensic science to create a link between crime and suspect.	
Alignment to Standards	
<ul style="list-style-type: none">• HS-ETS1-3.	
Key Concepts and Skills	
<ul style="list-style-type: none">• Identify and describe common weave patterns of textile samples.• Compare and contrast various types of fibers through physical and chemical analysis.• Describe principal characteristics of common fibers used in their identification.• Apply forensic science techniques to analyze fibers.	
Learning Activities	
Activities	
<ul style="list-style-type: none">• Lecture and classroom discussion• Computer Research projects• Current Event Articles•	
Lab Activities –	

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							Microscopic Analysis of Fibers, Fiber Identification - chemical analysis
<ul style="list-style-type: none"> • Cooperative learning – problem solving-solve a crime by analyzing fiber evidence • Case Studies-class discussion of evidence classification, processing procedures 							
Assessments							
<ul style="list-style-type: none"> • Quizzes • Formative Assessments • Inquiry Based Activities • Lab assignments 							
21st Century Skills							
X	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
X	Life & Career Skills	X	Information Technology	X	Media Literacy		
Interdisciplinary Connections							
<ul style="list-style-type: none"> • Math Skills – Calculating Magnification • Social Studies: All Lecture/Discussions require the historical development of the specific topic being studied. • Language Arts: Students will identify concepts learned in class & use writing skills to apply them to Case Studies-class discussion of evidence classification, processing procedures. 							
Technology Integration							
<ul style="list-style-type: none"> • PowerPoint Presentations • Data Projector • Elmo Incorporation • DVD • YouTube Content Shorts/CSI/Forensic Files Episodes • Microscope • Google Drive/Classroom 							

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Time Frame	1 week
Topic	
Fingerprints	
Essential Questions	
<ul style="list-style-type: none">• How is fingerprint evidence used to determine whether a crime has been committed?• Why is the use of fingerprints an imperfect form of identification?	
Enduring Understandings	
<ul style="list-style-type: none">• Evidence is needed to determine the method by which a crime has been committed.• Fingerprints are impressions left on a surface that consist of patterns made by the ridges on a finger.	
Alignment to Standards	
<ul style="list-style-type: none">• HS-ETS1-3.• TECH.8.1.12.A.CS1	
Key Concepts and Skills	
<ul style="list-style-type: none">• Discuss the history of fingerprinting.• Describe the characteristics of fingerprints.• Identify the basic types of fingerprints.• Describe how criminals attempt to alter their fingerprints.• Determine the reliability of fingerprints as a means of identification.• Explain how fingerprint evidence is collected.• Describe the latest identification technologies.• Determine if a fingerprint matches a fingerprint on record.• Use the process of lifting a latent print.	
Learning Activities	
Activities	
<ul style="list-style-type: none">• Lecture and classroom discussion• Computer Research projects• Current Event Articles• Lab activities such as Analyzing Fingerprints, Identifying Fingerprints• Cooperative learning – problem solving – Solve a crime with fingerprint evidence	

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<ul style="list-style-type: none"> Case Studies-class discussion of evidence classification, processing procedures 							
Assessments							
<ul style="list-style-type: none"> Quizzes Formative Assessments Inquiry Based Activities Webquests 							
21st Century Skills							
X	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
X	Life & Career Skills	X	Information Technology	X	Media Literacy		
Interdisciplinary Connections							
<ul style="list-style-type: none"> Social Studies: All Lecture/Discussions require the historical development of the specific topic being studied. Language Arts: Students will identify concepts learned in class & use writing skills to apply them to Case Studies-class discussion of evidence classification, processing procedures. 							
Technology Integration							
<ul style="list-style-type: none"> PowerPoint Presentations Data Projector Elmo Incorporation DVD YouTube Content Shorts/CSI/Forensic Files Episodes Google Drive/Classroom 							

Time Frame	1 week
Topic	
DNA Fingerprinting	
Essential Questions	
<ul style="list-style-type: none"> Where does a child get his/her DNA? What variations in the human genome exist among individuals? 	

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- What techniques are used in analyzing DNA evidence?

Enduring Understandings

- Evidence is needed to determine the method by which a crime has been committed.
- DNA evidence is an excellent tool for identification in forensic science because no two people except identical twins have the same DNA.

Alignment to Standards

- HS-ETS1-3.
- HS-LS3-1

Key Concepts and Skills

- Describe how crime-scene evidence is collected for DNA analysis.
- Explain how crime-scene evidence is processed to obtain DNA.
- Describe how radioactive probes are used in DNA fingerprinting.
- Describe how DNA evidence is compared for matching.
- Explain how DNA fingerprinting is used to determine if specimens come from related or unrelated individuals.
- Explain how to use DNA fingerprinting to identify DNA from a parent, child, or relative of another person.

Learning Activities

Activities

- Lecture and classroom discussion
- Current Event Articles
- Lab Activities – Where's the CAT? DNA Fingerprinting Simulation, Virtual Gel Electrophoresis Lab, DNA extraction from wheat germ lab
- Cooperative learning – problem solving- DNA Fingerprinting Lab
- Case Studies-class discussion of evidence classification, processing procedures

Assessments

- Quizzes
- Formative Assessments
- Tests
- Inquiry Based Activities
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21st Century Skills							
X	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
X	Life & Career Skills	X	Information Technology	X	Media Literacy		
Interdisciplinary Connections							
<ul style="list-style-type: none"> • Social Studies: All lecture/discussions require the historical development of the specific topic being studied. • Language Arts: Students will identify concepts learned in class & use writing skills to apply them to Case Studies-class discussion of evidence classification, processing procedures. 							
Technology Integration							
<ul style="list-style-type: none"> • PowerPoint Presentations • Data Projector • Elmo Incorporation • DVD • YouTube Content Shorts/CSI/Forensic Files Episodes • Google Drive/Classroom 							

Time Frame	1 week
Topic	
Handwriting Analysis, Forgery, and Counterfeiting	
Essential Questions	
<ul style="list-style-type: none"> • What are the different characteristics of handwriting that experts analyze during a forensic investigation? • What is an exemplar? • How is handwriting analyzed? • What is counterfeiting? 	
Enduring Understandings	
<ul style="list-style-type: none"> • Evidence is needed to determine the method by which a crime has been committed. 	

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- Document analysis is the examination and comparison of questioned documents with known material.
- Counterfeiting involves the copying of false documents or other items for the purpose of deception.

Alignment to Standards

- HS-ETS1-3.
- LA.11-12.WHST.11-12.1.A.

Key Concepts and Skills

- Describe twelve types of handwriting exemplars that can be analyzed in a document.
- Demonstrate an example of five of the twelve exemplars of handwriting traits.
- Identify the major goals of a forensic handwriting analysis.
- Describe some of the technology used in handwriting analysis.
- Distinguish between the terms *forgery* and *fraudulence*.
- Identify several ways in which businesses prevent check forgery.
- Describe four features of paper currency that are used to detect counterfeit bills.

Learning Activities

Activities

- Lecture and classroom discussion
- Formative Assessments
- Computer Research projects
- Current Event Articles
- Lab Activities –Self-evaluation and peer evaluation of handwriting samples noting exemplars, Microscopic Examination of U.S. currency security features & testing real & “counterfeit” bills using counterfeit-detecting pen
- Cooperative learning – problem solving -analysis of documents using chromatography and other methods to solve a crime
- Case Studies-class discussion of evidence classification, processing procedures

Assessments

- Quizzes
- Inquiry Based Activities
- Essay-Who killed Lindbergh’s baby?

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21st Century Skills							
X	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
X	Life & Career Skills	X	Information Technology	X	Media Literacy		
Interdisciplinary Connections							
<ul style="list-style-type: none"> • Math: Lab skills • Social Studies: All lecture/discussions require the historical development of the specific topic being studied. • Language Arts: Students will identify concepts learned in class & use writing skills to apply them to Case Studies-class discussion of evidence classification, processing procedures. 							
Technology Integration							
<ul style="list-style-type: none"> • PowerPoint Presentations • Data Projector • Elmo Incorporation • DVD • YouTube Content Shorts/CSI/Forensic Files Episodes • Google Drive/Classroom • Microscope 							

Time Frame	1 week
Topic	
Blood and Blood Spatter	
Essential Questions	
<ul style="list-style-type: none"> • What is the composition of blood? • How are blood types determined? • How are various sources of blood identified? • How are blood-spatter patterns created? 	

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Enduring Understandings

- Evidence is needed to determine the method by which a crime has been committed.
- Blood typing can be a form of class evidence.
- Blood-spatter analysis can be used to recreate a crime scene.

Alignment to Standards

- HS-ETS1-3.
- HS-LS3-1
- MA.9-12.S-CP.A.5

Key Concepts and Skills

- Describe the composition of blood.
- Describe the functions of blood cells.
- Explain a brief history of the use of blood and blood-spatter analysis in forensics.
- Describe how to determine the blood type of a sample of blood.
- Describe how to screen for the presence of human blood.
- Calculate the probability of certain blood types within a population.
- Conduct a blood-spatter analysis.
- Examine blood spatter patterns and determine the nature of the weapon.
- Use blood-spatter evidence to recreate the events at a crime scene.

Learning Activities

Activities

- Lecture and classroom discussion
- Calculating Blood type Probabilities
- Current Event Articles
- Lab activities –Blood-Spatter lab-evaluation/identification of simulated blood spatter patterns
- Cooperative learning – problem solving-using blood typing to solve a crime
- Case Studies-class discussion of evidence classification, processing procedures

Assessments

- Quizzes
- Formative Assessments
- Tests

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- Inquiry Based Activities
- Webquests

21st Century Skills

X	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
X	Life & Career Skills	X	Information Technology	X	Media Literacy		

Interdisciplinary Connections

- Math: Calculating blood-type probabilities
- Social Studies: All lecture/discussions require the historical development of the specific topic being studied.
- Language Arts: Students will identify concepts learned in class & use writing skills to apply them to Case Studies-class discussion of evidence classification, processing procedures.

Technology Integration

- PowerPoint Presentations
- Data Projector
- Elmo Incorporation
- DVD
- YouTube Content Shorts/CSI/Forensic Files Episodes
- Google Drive/Classroom

Time Frame	2 weeks
Topic	
Death: Meaning, Manner, Mechanism, Cause, and Time	
Essential Questions	
<ul style="list-style-type: none"> • What is the definition of death? • How do the manner, cause, mechanism, and time of death compare? 	

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- What kinds of evidence are present on a dead body to lead forensic examiners to conclude the manner, cause, mechanism, and time of death?

Enduring Understandings

- Evidence is needed to determine the method by which a crime has been committed.
- There are several definitions of death.
- Forensic scientists must determine the manner, cause, mechanism, and time of death.

Alignment to Standards

- HS-ETS1-3.
- HS-LS1-2
- MA.9-12.N-Q.A.1.

Key Concepts and Skills

- Discuss the definition of death.
- Distinguish between four manners of death: natural, accidental, suicidal, and homicidal.
- Differentiate between cause, manner, and mechanisms of death.
- Explain how the development of rigor, algor, and livor mortis occurs following death.
- Use evidence of rigor, algor, and livor mortis to calculate the approximate time of death.
- Describe the stages of decomposition of a corpse.
- Use evidence from the autopsy's report on stomach contents to estimate time of death.
- Explain how time of death can be estimated using insect evidence.
- Provide an example of the succession of different types of insects that are found on a body as it decomposes.
- Given insect evidence, livor, rigor, and algor mortis data, be able to estimate the time of death.
- Describe how various environmental factors may influence the estimated time of death.

Learning Activities

Activities

- Lecture and classroom discussion
- Computer Research projects
- Current Event Articles
- Lab Activities-Calculating time of death using rigor mortis data, Calculating time of death using algor mortis data and stomach and intestinal contents, Forensic entomology lab-students learn how forensic entomologists use maggots to determine post mortem interval (PMI)

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- Cooperative learning – problem solving
- Case Studies-class discussion of evidence classification, processing procedures

Assessments

- Quizzes
- Formative Assessments
- Tests
- Inquiry Based Activities
- Worksheets

21st Century Skills

X	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
X	Life & Career Skills	X	Information Technology	X	Media Literacy		

Interdisciplinary Connections

- Math: Lab skills
- Social Studies: All lecture/discussions require the historical development of the specific topic being studied.
- Language Arts: Students will identify concepts learned in class & use writing skills to apply them to Case Studies-class discussion of evidence classification, processing procedures.

Technology Integration

- PowerPoint Presentations
- Data Projector
- Elmo Incorporation
- DVD
- YouTube Content Shorts/CSI/Forensic Files Episodes
- Google Drive/Classroom

Time Frame	1 week
Topic	
Drug Identification and Toxicology	
Essential Questions	
<ul style="list-style-type: none"> • What are toxins? 	

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- What are the five types of controlled substances?
- What are the goals of toxicology?

Enduring Understandings

- Evidence is needed to determine the method by which a crime has been committed.
- Forensic toxicology is a valuable tool in establishing the cause of death at a crime scene.

Alignment to Standards

- HS-ETS1-3.
- TECH.8.1.12.C.CS1

Key Concepts and Skills

- Identify the five types of controlled substances.
- Give two examples of drugs in each of the five classes of controlled substances.
- Relate signs and symptoms of overdose with a specific class of drugs or toxins.
- Describe the role of various types of toxins in causing death.
- Discuss agents that may be used in bioterrorism.
- Define and describe the goals and practice of toxicology.

Learning Activities

Activities

- Lecture and classroom discussion
- Drug Awareness Project
- Current Event Articles
- Lab Activities-Drug Analysis
- Cooperative learning – Celebrity Overdose Presentations
- Case Studies-class discussion of evidence classification, processing procedures

Assessments

- Quizzes
- Formative Assessments
- Research Projects

21st Century Skills

X	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
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X	Life & Career Skills	X	Information Technology	X	Media Literacy
Interdisciplinary Connections					
<ul style="list-style-type: none"> • Math: Lab skills • Social Studies: All lecture/discussions require the historical development of the specific topic being studied. • Language Arts: Students will identify concepts learned in class & use writing skills to apply them to Case Studies-class discussion of evidence classification, processing procedures. 					
Technology Integration					
<ul style="list-style-type: none"> • PowerPoint Presentations • Data Projector • Elmo Incorporation • DVD • YouTube Content Shorts/CSI/Forensic Files Episodes • Google Drive/Classroom 					

Time Frame	1 week
Topic	
Forensic Anthropology: What We Learn from Bones	
Essential Questions	
<ul style="list-style-type: none"> • What are the characteristics of bone? • What can bones tell us? • What is the purpose of skeletal trauma analysis? 	
Enduring Understandings	
<ul style="list-style-type: none"> • Evidence is needed to determine the method by which a crime has been committed. • The conditions of bones can provide valuable clues to forensic investigators. 	
Alignment to Standards	
<ul style="list-style-type: none"> • HS-ETS1-3. • MA.9-12.N-Q.A.1. 	

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Key Concepts and Skills

- Explain how bone is formed.
- Distinguish between male and female skeletal remains based on skull, jaw, brow ridge, pelvis, and femur.
- Describe how bones contain a record of injuries and disease.
- Describe how a person's approximate age could be determined by examining his or her bones.
- Explain the differences in facial structures among different races.
- Explain the role of mitochondrial DNA in bone identification.

Learning Activities

Activities

- Lecture and classroom discussion
- Computer Research projects
- Current Event Articles
- Lab Activities- Determining the age of a skull, Bones: male or female?, Estimation of height from individual bones, Medical examiner's findings – finding the cause of death in various cases using given evidence,
- Cooperative learning - problem solving – Forensic Anthropology Lab-determine gender, race, age, and height of unidentified skeletal remains
- Case Studies-class discussion of evidence classification, processing procedures

Assessments

- Quizzes
- Formative Assessments
- Tests
- Inquiry Based Activities

21st Century Skills

X	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
X	Life & Career Skills	X	Information Technology	X	Media Literacy		

Interdisciplinary Connections

- Social Studies: All lecture/discussions require the historical development of the specific topic being studied.

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Time Frame	1 week
Topic	

- Language Arts: Students will identify concepts learned in class & use writing skills to apply them to Case Studies-class discussion of evidence classification, processing procedures.

Technology Integration

- PowerPoint Presentations
- Data Projector
- Elmo Incorporation
- DVD
- YouTube Content Shorts/CSI/Forensic Files Episodes
- Google Drive/Classroom

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Casts and Impressions

Essential Questions

- What are the three types of impressions?
- What characteristics lead impression evidence to be considered as class or individual?

Enduring Understandings

- Evidence is needed to determine the method by which a crime has been committed.
- Impression evidence consisting of shoes, tires, and teeth can provide clues to what happened at a crime scene.

Alignment to Standards

- HS-ETS1-3.

Key Concepts and Skills

- Differentiate between latent, patent, and plastic impressions.
- Explain how various types of impressions can be used as trace evidence.
- Describe how to make foot, shoe, tire, and tool mark impressions.
- Explain how track width and wheelbase information are used to identify vehicles.
- Prepare dental impressions and match them with bite marks.

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Time Frame	1 week
Topic	
Ballistics	
Essential Questions	
<ul style="list-style-type: none">• What types of guns are shotguns?• What is the trajectory of a projectile?• What kind of information can be learned from gunshot residue (GSR) examination?• What is NIBIN and how is it used to help solve crimes?	
Enduring Understandings	
<ul style="list-style-type: none">• Evidence is needed to determine the method by which a crime has been committed.• Ballistics is the study of bullets and firearms.• By recovering bullets and casings at a crime scene, investigators can learn information about the crime.• Investigators may be able to calculate a bullet's path or trajectory to find the location of the shooter.• Forensic specialists can use gunshot residue and gunshot wounds to help them recreate a crime scene.	
Alignment to Standards	
<ul style="list-style-type: none">• HS-ETS1-3.	
Key Concepts and Skills	
<ul style="list-style-type: none">• Differentiate between a handgun, a rifle, and a shotgun.• Distinguish between a bullet and a cartridge.• Describe rifling on a gun barrel and how it affects the flight of the projectile.• Explain the relationship between barrel size and caliber.• Describe how bullets are test-fired and matched.	

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- Discuss the role of ballistics recovery and examination at a crime scene.
- Determine the position of the shooter based on bullet trajectory.

Learning Activities

Activities

- Lecture and classroom discussion
- Computer Research projects
- Current Event Articles
- Lab Activities-Compare firing pin impressions from different sources, Ballistics lab-students examine a set of safe bullets found at a crime scene to uncover details surrounding the murder.
- Cooperative learning - problem solving
- Case Studies-class discussion of evidence classification, processing procedures

Assessments

- Quizzes
- Formative Assessments
- Inquiry Based Activities

21st Century Skills

X	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
X	Life & Career Skills	X	Information Technology	X	Media Literacy		

Interdisciplinary Connections

- Math: measuring skills
- Social Studies: All lecture/discussions require the historical development of the specific topic being studied.
- Language Arts: Students will identify concepts learned in class & use writing skills to apply them to Case Studies-class discussion of evidence classification, processing procedures.

Technology Integration

- PowerPoint Presentations
- Data Projector
- Elmo Incorporation
- DVD

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- YouTube Content Shorts/CSI/Forensic Files Episodes
- Google Drive/Classroom

Time Frame	1 week
Topic	
Crime Case Study Project	
Essential Questions	
<ul style="list-style-type: none">• What events took place during the crime?• How is a crime scene processed?• How is evidence collected and analyzed?• What types of professionals and techniques are needed to process each type of evidence?	
Enduring Understandings	
<ul style="list-style-type: none">• Evidence is needed to determine the method by which a crime has been committed.• Investigators apply specific procedures and techniques to collect trace evidence.• All forms of evidence must be properly preserved in order to recreate as complete a picture as possible of what took place before, during, and after the crime.	
Alignment to Standards	
<ul style="list-style-type: none">• HS-ETS1-3.• TECH.8.1.12.C.CS2• LA.11-12.RST.11-12.2	
Key Concepts and Skills	
<ul style="list-style-type: none">• Collect evidence using proper procedures.• Analyze evidence with proper tools and techniques to determine the details surrounding the crime.	

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Learning Activities

- Students choose a crime to research and choose the method of presenting the forensic evidence pertaining to the crime to their peers.

Assessments

- Project
- Summative Assessment

21st Century Skills

X	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
X	Life & Career Skills	X	Information Technology	X	Media Literacy		

Interdisciplinary Connections

- Language Arts: Students will identify concepts learned in class & use writing skills to apply them to Case Studies-class discussion of evidence classification, processing procedures.

Technology Integration

- Google Drive/Classroom
- Elmo Incorporation
- YouTube Content Shorts

Modifications (ELL, Special Education, Gifted and Talented, and 504 Plans)

ELL:

- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher models reading aloud daily
- Provide peer tutoring
- Use of Bilingual Dictionary
- Guided notes and/or scaffold outline for written assignments
- Provide students with English Learner leveled readers.

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Supports for Students With IEPs:

- Allow extra time to complete assignments or tests
- Guided notes and/or scaffold outline for written assignments
- Work in a small group
- Allow answers to be given orally or dictated
- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP modifications

Gifted and Talented:

- Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles)
- Provide options, alternatives and choices to differentiate and broaden the curriculum
- Organize and offer flexible small group learning activities
- Provide whole group enrichment explorations
- Teach cognitive and methodological skills
- Use center, stations, or contracts
- Organize integrated problem-solving simulations
- Propose interest-based extension activities
- Expose students to beyond level texts.

Supports for Students With 504 Plans:

- Follow all the 504 plan modifications
- Text to speech/audio recorded selections
- Amplification system as needed
- Leveled texts according to ability
- Fine motor skill stations embedded in rotation as needed
- Modified or constrained spelling word lists
- Provide anchor charts with high frequency words and phonemic patterns

Integrated 21st-Century Skills and Career Ready Practices (NJSL 9):

All students will demonstrate how to:

- Act as a responsible and contributing citizen and employee.
- Apply appropriate academic and technical skills.
- Attend to personal health and financial well-being.
- Communicate clearly and effectively and with reason.
- Consider the environmental, social and economic impacts of decisions.
- Demonstrate creativity and innovation.
- Employ valid and reliable research strategies.
- Utilize critical thinking to make sense of problems and persevere in solving them.

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- Model integrity, ethical leadership and effective management.
- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity.
- Work productively in teams while using cultural global competence.

Standard 9.1 21st-Century Life and Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

Standard 9.2 Personal Financial Literacy: All students will develop skills and strategies that promote personal and financial responsibility related to financial planning, savings, investment, and charitable giving in the global economy.

Standard 9.3 Career Awareness, Exploration, and Preparation: All students will apply knowledge about and engage in the process of career awareness, exploration, and preparation in order to navigate the globally competitive work environment of the information age.

Standard 9.4 Career and Technical Education: All students who complete a career and technical education program will acquire academic and technical skills for careers in emerging and established professions that lead to technical skill proficiency, credentials, certificates, licenses, and/or degrees.

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