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 Documents

School: Ocean Township High School

Course: Forensic Science

Department: Science

Supervisor: Patrick Sullivan

Board Approval	Supervisor	Notes
August 2012	Patrick Sullivan	Update Standards
August 2013	Patrick Sullivan	Update Standards
December 2017	Patrick Sullivan	Update Standards

DEPARTMENT: Science **COURSE:** Forensic Science

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

DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	**1 week**

Topic

Observation Skills

Essential Questions

- 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

- The brain can alter information taken in through the senses.
- Forensic scientists find, examine, and evaluate evidence by utilizing observation skills.

Alignment to NJSLS-S

HS-ETS1-2 HS-PS1-6
HS-LS3-1
HS-LS3-2
HS-LS3-3

Key Concepts and Skills

- 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

- Lecture and classroom discussion
- Computer Research projects 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
- Case Studies

Assessments

- Quizzes
- Tests
- Inquiry Based Activities
- Worksheets

21st Century Skills

X	Creativity	**X**	Critical Thinking	**X**	Communication	**X**	Collaboration

DEPARTMENT: Science **COURSE:** Forensic Science

X	Life & Career Skills	**X**	Information Literacy	**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/VHS
- YouTube Content Shorts/CSI/Forensic Files Episodes

DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 week

Topic

Crime-Scene Investigation and Evidence Collection

Essential Questions

- 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

- 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 NJSLS-S

HS-ETS1-2 HS-PS1-6
HS-LS3-1
HS-LS3-2
HS-LS3-3

Key Concepts and Skills

- 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.
- 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
- Cooperative learning – problem solving
- Case Studies

DEPARTMENT: Science **COURSE:** Forensic Science

Assessments

- Quizzes
- Tests
- Lab activities
- Worksheets

21st Century Skills

X	Creativity	**X**	Critical Thinking	**X**	Communication	**X**	Collaboration
X	Life & Career Skills	**X**	Information Literacy	**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.

Technology Integration

- PowerPoint Presentations
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- DVD/VHS
- YouTube Content Shorts/CSI/Forensic Files Episodes

DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 week

Topic

Fingerprints

Essential Questions

- 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

- 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 NJSLS-S

HS-ETS1-2 HS-PS1-6
HS-LS3-1
HS-LS3-2
HS-LS3-3

Key Concepts and Skills

- 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

- Lecture and classroom discussion
- Computer Research projects
- Current Event Articles

Lab activities such as Fingerprinting on a ten card, Lifting latent prints with fingerprint powder

- Cooperative learning – problem solving
- Case Studies

Assessments

- Quizzes
- Tests
- Inquiry Based Activities
- Worksheets

DEPARTMENT: Science **COURSE:** Forensic Science

21st Century Skills							
X	Creativity	**X**	Critical Thinking	**X**	Communication	**X**	Collaboration
X	Life & Career Skills	**X**	Information Literacy	**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
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DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 week

Topic

The Study of Hair

Essential Questions

- 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

- 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 NJSLS-S

HS-ETS1-2 HS-PS1-6
HS-LS3-1
HS-LS3-2
HS-LS3-3

Key Concepts and Skills

- 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.
- 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 Hair identification of various sources using microscopy
- Cooperative learning – problem solving
- Case Studies

Assessments

- Quizzes
- Tests
- Lab Activities
- Worksheets

21st Century Skills

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

	Skills				

Interdisciplinary Connections

- Math: Lab skills-Calculations
- 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
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DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 week

Topic

A Study of Fibers and Textiles

Essential Questions

- 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

- 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 NJSLS-S

HS-ETS1-2 HS-PS1-6
HS-LS3-1
HS-LS3-2
HS-LS3-3

Key Concepts and Skills

- 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

- Lecture and classroom discussion
- Computer Research projects
- Current Event Articles
- Lab Activities – Microscopic Analysis of Fibers, Fiber Identification -chemical analysis of fibers
- Cooperative learning – problem solving
- Case Studies

Assessments

- Quizzes
- Tests
- Inquiry Based Activities
- Worksheets

21st Century Skills

X	Creativity	**X**	Critical Thinking	**X**	Communication	**X**	Collaboration

DEPARTMENT: **Science** **COURSE:** **Forensic Science**

X	Life & Career Skills	**X**	Information Literacy	**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.

Technology Integration

- PowerPoint Presentations
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DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 week

Topic

Drug Identification and Toxicology

Essential Questions

- What are toxins?
- 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 NJSLS-S

HS-ETS1-2 HS-PS1-6
HS-LS3-1
HS-LS3-2
HS-LS3-3

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
- Computer Research projects
- Current Event Articles
- Lab Activities-Drug Analysis
- Cooperative learning – problem solving
- Case Studies

Assessments

- Quizzes
- Tests
- Inquiry Based Activities
- Worksheets

21st Century Skills

DEPARTMENT: Science **COURSE:** Forensic Science

X	Creativity	**X**	Critical Thinking	**X**	Communication	**X**	Collaboration
X	Life & Career Skills	**X**	Information Literacy	**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.

Technology Integration

- PowerPoint Presentations
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- DVD/VHS
- YouTube Content Shorts/CSI/Forensic Files Episodes

DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 week

Topic

DNA Fingerprinting

Essential Questions

- Where does a child get his/her DNA?
- What variations in the human genome exist among individuals?
- 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 NJSLS-S

HS-ETS1-2 HS-PS1-6
HS-LS3-1
HS-LS3-2
HS-LS3-3

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
- Computer Research projects
- Current Event Articles
- Lab Activities – Where's the CAT? DNA Fingerprinting Simulation, The Break-In DNA
- Fingerprinting Analysis Activity, Romanov family internet search
- Cooperative learning – problem solving
- Case Studies

Assessments

- Quizzes
- Tests
- Inquiry Based Activities
- Worksheets

21st Century Skills

X	Creativity	**X**	Critical Thinking	**X**	Communication	**X**	Collaboration
X	Life & Career Skills	**X**	Information Literacy	**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
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- YouTube Content Shorts/CSI/Forensic Files Episodes

DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 week

Topic

Blood and Blood Spatter

Essential Questions

- What is the composition of blood?
- How are blood types determined?
- How are various sources of blood identified?
- How are blood-spatter patterns created?

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 NJSLS-S

HS-ETS1-2 HS-PS1-6
HS-LS3-1
HS-LS3-2
HS-LS3-3

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 stab wounds and describe the nature of the weapon.
- Use blood-spatter evidence to recreate the events at a crime scene.

Learning Activities

Activities

- Lecture and classroom discussion

Computer Research projects

- Current Event Articles
- Lab activities – Kastle-Meyer Presumptive Test for Blood, Blood Typing Simulation Activity, Blood-Spatter lab
- Cooperative learning – problem solving
- Case Studies

Assessments

- Quizzes
- Tests
- Inquiry Based Activities
- Worksheets

21st Century Skills

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

Interdisciplinary Connections

- Math: Calculating blood-type probabilities, 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.

Technology Integration

- PowerPoint Presentations
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- YouTube Content Shorts/CSI/Forensic Files Episodes

DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 week

Topic

Handwriting Analysis, Forgery, and Counterfeiting

Essential Questions

- 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

- Evidence is needed to determine the method by which a crime has been committed.
- 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 NJSLS-S

HS-ETS1-2 HS-PS1-6
HS-LS3-1
HS-LS3-2
HS-LS3-3

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
- Computer Research projects
- Current Event Articles
- Lab Activities –Self-evaluation and peer evaluation of handwriting samples noting exemplars, Analysis of documents using chromatography and other methods to solve a crime, Examination of U.S. currency with a microscope and noting features that distinguish genuine money from counterfeit money
- Cooperative learning – problem solving
- Case Studies

DEPARTMENT: Science **COURSE:** Forensic Science

Assessments

- Quizzes
- Tests
- Inquiry Based Activities
- Worksheets

21st Century Skills

X	Creativity	**X**	Critical Thinking	**X**	Communication	**X**	Collaboration
X	Life & Career Skills	**X**	Information Literacy	**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.

Technology Integration

- PowerPoint Presentations
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- YouTube Content Shorts/CSI/Forensic Files Episodes

DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 week

Topic

Death: Meaning, Manner, Mechanism, Cause, and Time

Essential Questions

- What is the definition of death?
- How do the manner, cause, mechanism, and time of death compare?
- 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 NJSLS-S

HS-ETS1-2
HS-LS3-1
HS-LS3-2
HS-LS3-3
HS-PS1-6

Key Concepts and Skills

- Discuss the definition of death.
- Distinguish between four manners of death: natural, accidental, suicidal, and homicidal.
- Distinguish 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, Estimating the Time of Death Using Insect, Algor, and Livor Mortis Evidence, Forensic Entomology Lab- students learn how forensic entomologists use maggots to determine post mortem interval (PMI) using microscopy Cooperative learning – problem solving
- Case Studies

Assessments

- Quizzes
- Tests
- Inquiry Based Activities
- Worksheets

21st Century Skills

X	Creativity	**X**	Critical Thinking	**X**	Communication	**X**	Collaboration
X	Life & Career Skills	**X**	Information Literacy	**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.

Technology Integration

- PowerPoint Presentations
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- DVD/VHS
- YouTube Content Shorts/CSI/Forensic Files Episodes

DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 week

Topic

Forensic Anthropology: What We Learn from Bones

Essential Questions

- What are the characteristics of bone?
- What can bones tell us?
- What is the purpose of skeletal trauma analysis?

Enduring Understandings

- 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 NJSLS-S

HS-ETS1-2 HS-PS1-6
HS-LS3-1
HS-LS3-2
HS-LS3-3

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 Body Size From Individual Bones, Medical Examiner's Findings – finding the cause of death in various cases using given evidence
- Cooperative learning - problem solving
- Case Studies

Assessments

- Quizzes
- Tests
- Inquiry Based Activities
- Worksheets

DEPARTMENT: Science **COURSE:** Forensic Science

21st Century Skills							
X	Creativity	**X**	Critical Thinking	**X**	Communication	**X**	Collaboration
X	Life & Career Skills	**X**	Information Literacy	**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
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- DVD/VHS
- YouTube Content Shorts/CSI/Forensic Files Episodes

DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 week

Topic

Ballistics

Essential Questions

- 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 NIBIS and how is it used to help solve crimes?

Enduring Understandings

- 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 also use gunshot residue and gunshot wounds to help them recreate a crime scene.

Alignment to NJSLS-S

HS-ETS1-2 HS-PS1-6
HS-LS3-1
HS-LS3-2
HS-LS3-3

Key Concepts and Skills

- 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.
- 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, Mystery of Lyle & Louise-Bullet Striations -students examine a set of bullets found at a crime scene to uncover details surrounding the murder.

- Cooperative learning - problem solving
- Case Studies

Assessments

- Quizzes
- Tests
- Inquiry Based Activities
- Worksheets

21st Century Skills

X	Creativity	**X**	Critical Thinking	**X**	Communication	**X**	Collaboration
X	Life & Career Skills	**X**	Information Literacy	**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.

Technology Integration

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

DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 week

Topic

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 NJSLS-S

HS-ETS1-2
HS-LS3-1
HS-LS3-2
HS-LS3-3
HS-PS1-6

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 is used to identify vehicles.
- Prepare dental impressions and match them with bite marks.

Activities

- Lecture and classroom discussion
- Computer Research projects
- Current Event Articles
- Lab Activities-Foot Size and Height – students explore the relationship between foot length, shoe size, shoe length, and height, Tire Impressions and Analysis – students use tire impressions to solve a crime, Animal Dental Impressions – students create impressions of their bite marks, match bite marks found on a victim with bite marks from a suspect using data.
- Cooperative learning - problem solving
- Case Studies

- Quizzes
- Tests
- Inquiry Based Activities
- Worksheets

DEPARTMENT: **Science** **COURSE:** **Forensic Science**

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

- 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.

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

DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 week

Topic

Tool Marks

Essential Questions

- What is the difference between abrasions, cuts, and indentations on a surface?
- What are the steps taken when collecting and preserving tool mark evidence?

Enduring Understandings

- Evidence is needed to determine the method by which a crime has been committed.
- Impression evidence consisting of tool marks can provide clues to what happened at a crime scene.

Alignment to NJSLS-S

HS-ETS1-2 HS-PS1-6
HS-LS3-1
HS-LS3-2
HS-LS3-3

Key Concepts and Skills

- Discuss the significance of tool mark impressions in criminal investigations.
- Describe three major types of tool mark impressions.
- Describe variations in tool surface characteristics that are used to identify individual tools.
- Summarize the steps of a tool mark examination and analysis.
- Explain how technology is helping tool experts in criminal investigations.
- Match tool marks with the instrument that produced them.
- Describe how tool mark evidence is collected, preserved, and documented.

Learning Activities

Activities

- Lecture and classroom discussion
- Computer Research projects
- Current Event Articles
- Lab Activities- Tool Mark Identification – students identify the tool used in a crime

Cooperative learning - problem solving

- Case Studies

Assessments

- Quizzes
- Tests
- Inquiry Based Activities
- Worksheets

21st Century Skills

DEPARTMENT: **Science** **COURSE:** **Forensic Science**

X	Creativity	**X**	Critical Thinking	**X**	Communication	**X**	Collaboration
X	Life & Career Skills	**X**	Information Literacy	**X**	Media Li teracy		

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.

Technology Integration

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

DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 Week

Topic

Soil, Pollen, and Spore Examination

Essential Questions

- How can soil evidence help link a suspect to the crime scene or victim?
- How are soil, pollen, and spore samples collected, labeled, and packaged?
- How can pollen be used to determine if a crime occurred in the city or in the country? In the day or night?

Enduring Understandings

- Evidence is needed to determine the method by which a crime has been committed.
- Soil recovered from a crime scene, a victim, or a suspect can be analyzed to determine commonality and significance.
- Pollen and spores are both reproductive structures that can be used as trace evidence.

Alignment to NJSLS-S

HSETS12 HS-PS1-6
HS-LS31
HS-LS32
HS-LS3-3

Key Concepts and Skills

- Identify various soil types and describe some methods for examining soil samples.
- Distinguish sand samples by size, color, and composition.
- Perform a soil analysis, including macroscopic and microscopic examination, as well as chemical and physical analysis.
- Explain how soil evidence can link suspects to crime scenes.
- Distinguish between pollen and spores.
- Define a pollen "fingerprint".
- Classify the different organisms that produce pollen and spores.
- Summarize the different methods of pollination in plants and the relevance in solving crimes.
- Identify the different ways that spores are dispersed.
- State characteristics of pollen and spores that are important for identification in forensic studies.
- Summarize how pollen and spore evidence is collected at a crime scene.
- Describe how pollen and spore samples are analyzed and evaluated.

Learning Activities

Activities

- Lecture and classroom discussion
- Computer Research projects Current Event Articles
- Lab Activities-Palynology Case Studies Presentation, Examination of sand – do samples have a common composition and origin?
- Cooperative learning - problem solving
- Case Studies

Assessments

- Quizzes
- Tests
- Inquiry Based Activities
- Worksheets

DEPARTMENT: Science **COURSE:** Forensic Science

21st Century Skills							
X	Creativity	X	Critical Thinking	X	Communication	X	Collaboration
X	Life & Career Skills	X	Information Literacy	X	Media Literacy		

Interdisciplinary Connections

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Technology Integration

- PowerPoint Presentations
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DEPARTMENT: Science **COURSE:** Forensic Science

Time Frame	1 Week

Topic

Group Crime Scene Creation & Solving Project

Essential Questions

- 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?
- What events took place before, during, and after the crime?

Enduring Understandings

- 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 NJSLS-S

HS-ETS1-2
HS-LS3-1
HS-LS3-2
HS-LS3-3
HS-PS1-6

Key Concepts and Skills

- Collect evidence using proper procedures.
- Analyze evidence with proper tools and techniques to determine the details surrounding the crime.

Learning Activities

Activities

- Cooperative learning - problem solving
- Showcasing creative skills

Assessments

- Quizzes
- Tests
- Inquiry Based Activities
- Worksheets

21st Century Skills

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

Interdisciplinary Connections

- Math: Lab skills
- Language Arts: Students will identify concepts learned in class & use writing skills to apply them to case studies.
- Art: Students showcase creativity.

Technology Integration

- PowerPoint Presentations
- Data Projector
- Elmo Incorporation
- DVD/VHS

YouTube Content Shorts/CSI/Forensic Files Episodes