



HS FORENSICS CURRICULUM

Middle Township Public Schools

216 S. Main Street

Cape May Court House, NJ 08210

Born On Date: August 2018

Middle Township Public Schools

Content Area:	Forensics	Grade(s) 10-12
Unit Plan Title:	Observations	
Unit Topics:	Lab Safety, Witnesses, Innocence Project	
Standard(s) Number and Description (Established Goals)		
<p>HS-LS1-1 From Molecules to Organisms: Structures and Processes – 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.</p> <p>HS-LS3-1 Heredity: Inheritance and Variation of Traits – Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.</p> <p>HS-LS3-3 Heredity: Inheritance and Variation of Traits – Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.</p> <p>HS-LS4-1 Biological Evolution: Unity and Diversity – Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.</p> <p>HS-ETS1-2 Engineering Design – Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p>		
Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)		
<p><i>Students will understand that...</i></p> <ol style="list-style-type: none"> 1. The brain can alter information taken in through the senses. 2. Forensic scientists find, examine, and evaluate evidence by utilizing observation skills. 		
Essential Questions : (What provocative questions will foster inquiry, understanding, and transfer of learning?)		
<ol style="list-style-type: none"> 1. What is the importance of laboratory safety? 2. What is a forensic scientist’s role when called to a court of law? 3. How do emotions affect our mental state when we are observing something? 		

Middle Township Public Schools

	<ol style="list-style-type: none"> 4. What was the main conclusion of the Innocence Project? 5. What are some ways to improve our observational skills? 	
Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)		
<p><i>Students will know....</i></p> <ol style="list-style-type: none"> 1. Observation is how one perceives their surroundings. 2. The brain affects observations by filtering the information you take in from the environment. 3. Eyewitnesses are unreliable 4. Investigators are trained to improve their observation skills. 	<p><i>Students will be able to (do)...</i></p> <ol style="list-style-type: none"> 1. Define observation and describe what changes occur in the brain. 2. Describe examples of factors influencing eyewitness accounts of events after creating their own experiment and sharing relevant data. 3. Compare the reliability of eyewitness testimony to what actually happened. 4. Relate observation skills to their use in forensic science. 5. Define forensic science. 6. Practice and improve their own observation skills. 7. Analyze current case studies. 	
Key Vocabulary and Terms:		
<i>Analytical Skills, Deductive Reasoning, Eyewitness, Fact, Forensic, Logical, Observations, Opinion, Perception</i>		

Content Area:	Forensics	Grade(s) 10-12
Unit Plan Title:	Crime Scene Investigation and Evidence Collection	
Unit Topics:	Principle of Exchange, Types of Evidence, The Seven S's, Mapping, Analyzing, Reconstruction	
Standard(s) Number and Description (Established Goals)		
HS-LS1-1 From Molecules to Organisms: Structures and Processes – 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.		

Middle Township Public Schools

HS-LS3-1 Heredity: Inheritance and Variation of Traits – Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

HS- LS3-3 Heredity: Inheritance and Variation of Traits – Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

HS-LS4-1 Biological Evolution: Unity and Diversity – Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

HS-ETS1-2 Engineering Design – Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)

Students will understand that...

1. Crime scenes must be processed in a procedural manner.
2. Evidence is needed to determine the method by which a crime has been committed.

Essential Questions : (What provocative questions will foster inquiry, understanding, and transfer of learning?)

1. What are the implications in analyzing evidence related to Locard’s Principle of Exchange?
2. What are some examples of trace evidence?
3. What are the various types of evidence?
4. Why is it important to “separate the witnesses” at the crime scene?
5. What procedures are required when collecting evidence from a crime scene?
6. What are the essential elements of a crime scene sketch?

Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)

Students will know....

1. Crime-Scene investigators recognize, document, collect, and organize evidence left at the scene of the crime.
2. Investigators apply specific procedures and techniques to collect trace evidence, a kind of

Students will be able to (do)...

1. Describe Locard’s exchange principle.
2. Identify four examples of trace evidence.
3. Distinguish between direct and circumstantial evidence.
4. Identify the type of professionals who are present at a crime scene.

Middle Township Public Schools

<p>circumstantial evidence.</p> <p>3. It is important to preserve both direct and indirect evidence so that professionals can recreate as complete a picture as possible.</p> <p>4. Investigators must secure the crime scene; separate witnesses, take photographs and sketch the scene; and search, secure, and properly package evidence.</p>	<p>5. Summarize the seven steps of a crime-scene investigation.</p> <p>6. Explain the importance of securing the crime scene.</p> <p>7. Identify the methods by which a crime scene is documented.</p> <p>8. Demonstrate proper technique in collecting and packaging trace evidence.</p> <p>9. Describe how evidence from a crime scene is analyzed.</p> <p>10. Analyze a current case study related to the topic.</p>
Key Vocabulary and Terms:	
<i>Chain of Custody, Circumstantial Evidence, Class Evidence, Crime-Scene Investigation, Reconstruction, Datum Point, Direct Evidence, First Responder, Individual Evidence, Paper Bindle, Primary Crime Scene, Secondary Crime Scene, Trace Evidence, Triangulation</i>	

Content Area:	Forensics	Grade(s) 10-12
Unit Plan Title:	Hair Analysis	
Unit Topics:	History, Functions, Structure, Ethnic/Ancestral Differences, Animal/Human, Collection, Examination	
Standard(s) Number and Description (Established Goals)		
<p>HS-LS1-1 From Molecules to Organisms: Structures and Processes – 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.</p> <p>HS-LS3-1 Heredity: Inheritance and Variation of Traits – Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.</p> <p>HS- LS3-3 Heredity: Inheritance and Variation of Traits – Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.</p> <p>HS-LS4-1 Biological Evolution: Unity and Diversity – Communicate scientific information that common ancestry and biological</p>		

Middle Township Public Schools

<p>evolution are supported by multiple lines of empirical evidence.</p> <p>HS-ETS1-2 Engineering Design – Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p>	
<p>Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)</p>	
<p>Students will understand that...</p> <ol style="list-style-type: none"> 1. Evidence is needed to determine the method by which a crime has been committed. 2. Hair can be analyzed chemically and with a microscope for visual characteristics. 	
<p>Essential Questions : (What provocative questions will foster inquiry, understanding, and transfer of learning?)</p>	
<ol style="list-style-type: none"> 1. Why is hair considered class evidence? 2. What is the structure of hair? 3. How are the parts of a hair used for various forensic investigations? 	
<p>Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)</p>	
<p><i>Students will know....</i></p> <ol style="list-style-type: none"> 1. Hair is an important structure found on mammals, including humans. 2. All hairs have the same basic structure, differences in the specific characteristics of an individual's hair can help an investigator determine general characteristics of that individual. 3. Forensic investigators rely on their knowledge of hair structure, function, and variation when they use hair from a crime scene as evidence. 	<p><i>Students will be able to (do)...</i></p> <ol style="list-style-type: none"> 1. Identify the various parts of a hair. 2. Describe variations in the structure of the medulla, cortex, and cuticle. 3. Distinguish between human and nonhuman animal hair. 4. Determine if two examples of hair are likely to be from the same person. 5. Explain how hair can be used in a forensic investigation. 6. Calculate the medullary index for a hair. 7. Distinguish hairs from individuals belonging to the broad racial categories. 8. Analyze a current case study related to the topic.
<p>Key Vocabulary and Terms:</p>	

Middle Township Public Schools

Comparison Microscope, Cortex, Cuticle, Gas Chromatography, Hair Follicle, Hair Shaft, Keratin, Medulla, Melanin Granules, Mitochondria DNA (mtDNA), Nuclear DNA

Content Area:	Forensics	Grade(s) 10-12
Unit Plan Title:	Fibers and Textiles	
Unit Topics:	Collecting, Sampling, Evaluating, Classification	
Standard(s) Number and Description (Established Goals)		
<p>HS-LS1-1 From Molecules to Organisms: Structures and Processes – 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.</p> <p>HS-LS3-1 Heredity: Inheritance and Variation of Traits – Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.</p> <p>HS-LS3-3 Heredity: Inheritance and Variation of Traits – Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.</p> <p>HS-LS4-1 Biological Evolution: Unity and Diversity – Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.</p> <p>HS-ETS1-2 Engineering Design – Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p>		
Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)		
<p>Students will understand that...</p> <ol style="list-style-type: none"> 1. Evidence is needed to determine the method by which a crime has been committed. 2. Fiber evidence can be used in forensic science to create a link between crime and suspect. 		
Essential Questions : (What provocative questions will foster inquiry, understanding, and transfer of learning?)		

Middle Township Public Schools

<ol style="list-style-type: none"> 1. Why are fibers an excellent source of trace evidence? 2. How do natural fibers differ from synthetic fibers? 3. How is fiber evidence gathered? 4. How are fibers identified? 	
Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)	
<p><i>Students will know....</i></p> <ol style="list-style-type: none"> 1. Fibers can be transferred between people and between people and their environments. 2. A close study of fibers can prove contact between a victim and a suspect, or between a person and a crime scene. 3. Yarns are made of fibers. Textiles are created by weaving perpendicular yarns. 4. Weave patterns can be used to identify sources of textiles at crime scenes. 5. Fiber types can be determined by physical and chemical analysis. 	<p><i>Students will be able to (do)...</i></p> <ol style="list-style-type: none"> 1. Identify and describe common weave patterns of textile samples. 2. Compare and contrast various types of fibers through physical and chemical analysis. 3. Describe principal characteristics of common fibers used in their identification. 4. Apply forensic science techniques to analyze fibers. 5. Analyze a current case study related to the topic.
Key Vocabulary and Terms:	
<p><i>Amorphous, Crystalline, Direct Transfer, Fiber, Mineral Fiber, Monomer, Natural Fiber, Polymer, Secondary Transfer, Synthetic Fiber, Textile, Warp, Weft, Yarn</i></p>	

Content Area:	Forensics	Grade(s) 10-12
----------------------	-----------	----------------

Middle Township Public Schools

Unit Plan Title:	Fingerprints
Unit Topics:	Historical Development, Formation, Characteristics, Types, Alterations, Future Technology
Standard(s) Number and Description (Established Goals)	
<p>HS-LS1-1 From Molecules to Organisms: Structures and Processes – 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.</p> <p>HS-LS3-1 Heredity: Inheritance and Variation of Traits – Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.</p> <p>HS-LS3-3 Heredity: Inheritance and Variation of Traits – Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.</p> <p>HS-LS4-1 Biological Evolution: Unity and Diversity – Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.</p> <p>HS-ETS1-2 Engineering Design – Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p>	
Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)	
<i>Students will understand that...</i>	
<ol style="list-style-type: none"> 1. How is fingerprint evidence used to determine whether a crime has been committed? 2. Why is the use of fingerprints an imperfect form of identification? 	
Essential Questions : (What provocative questions will foster inquiry, understanding, and transfer of learning?)	
<ol style="list-style-type: none"> 1. How is fingerprint evidence used to determine whether a crime has been committed? 2. Why is the use of fingerprints an imperfect form of identification? 	
Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)	

Middle Township Public Schools

<p><i>Students will know....</i></p> <ol style="list-style-type: none"> 1. A person's fingerprints develop before birth. 2. Fingerprints are unique to each individual. 3. Ridges are in the shapes of loops, arches, and whorls. 4. Computer algorithms based on location of minutiae help to sort fingerprints. 5. Fingerprints can be collected by using tape, powders, or other chemicals; or they can be photographed and compared with criminal fingerprint cards on file. 	<p><i>Students will be able to (do)...</i></p> <ol style="list-style-type: none"> 1. Discuss the history of fingerprinting. 2. Describe the characteristics of fingerprints. 3. Identify the basic types of fingerprints. 4. Describe how criminals attempt to alter their fingerprints. 5. Determine the reliability of fingerprints as a means of identification. 6. Explain how fingerprint evidence is collected. 7. Describe the latest identification technologies. 8. Determine if a fingerprint matches a fingerprint on record. 9. Use the process of lifting a latent print during a lab activity. 10. Analyze a current case study related to the topic.
<p>Key Vocabulary and Terms:</p>	
<p><i>Arch, Core, Delta, Fingerprint, IAFIS, Latent, Loop, Minutiae, Patent, Plastic Fingerprint, Ridge Count, Ridge Pattern, Ten Card, Whorl</i></p>	

Content Area:	Forensics	Grade(s) 10-12
Unit Plan Title:	DNA Profiling	
Unit Topics:	Structure, Chromosomes, Gel Electrophoresis, Short Tandem Repeats, STR Profiles, Y STR & mtDNA, Romanav Families	
	Standard(s) Number and Description (Established Goals)	
	<p>HS-LS1-1 From Molecules to Organisms: Structures and Processes – 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.</p> <p>HS-LS3-1 Heredity: Inheritance and Variation of Traits – Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.</p> <p>HS-LS3-3 Heredity: Inheritance and Variation of Traits – Apply concepts of statistics and probability to explain the variation and</p>	

Middle Township Public Schools

distribution of expressed traits in a population.

HS-LS4-1 Biological Evolution: Unity and Diversity – Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

HS-ETS1-2 Engineering Design – Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)

Students will understand that...

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

Essential Questions : (What provocative questions will foster inquiry, understanding, and transfer of learning?)

1. Where does a child get his/her DNA?
2. What variations in the human genome exist among individuals?
3. What techniques are used in analyzing DNA evidence?

Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)

Students will know....

1. DNA is an important form of evidence that is used in criminal and civil investigations.
2. DNA can be isolated from saliva, blood, urine, or human remains.
3. Mitochondrial DNA and Y STRs can be analyzed to trace maternal or paternal relatives respectively.
4. Biotechnological advances have improved the accuracy and speed of analyzing DNA.

Students will be able to (do)...

1. Describe how crime-scene evidence is collected for DNA analysis.
2. Explain how crime-scene evidence is processed to obtain DNA.
3. Describe how radioactive probes are used in DNA fingerprinting.
4. Describe how DNA evidence is compared for matching.
5. Explain how DNA fingerprinting is used to determine if

Middle Township Public Schools

	<p>specimens come from related or unrelated individuals.</p> <p>6. Explain how to use DNA fingerprinting to identify DNA from a parent, child, or relative of another person.</p> <p>7. Analyze a current case study related to the topic.</p>
Key Vocabulary and Terms:	
<i>Allele, Chromosome, DNA Fingerprint, Electrophoresis, Exon, Gene, Genome, Intron, Karyotype, Polymerase Chain Reaction, Polymorphism, Primer, Restriction Enzyme, Restriction Fragment, Short Tandem Repeats</i>	

Content Area:	Forensics	Grade(s) 10-12
Unit Plan Title:	Blood and Blood Spatter	
Unit Topics:	History, Composition, Blood Types, Antigen-Antibody Response, Blood Spatter Patterns, Crime Scene Investigations	
Standard(s) Number and Description (Established Goals)		
<p>HS-LS1-1 From Molecules to Organisms: Structures and Processes – 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.</p> <p>HS-LS3-1 Heredity: Inheritance and Variation of Traits – Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.</p> <p>HS-LS3-3 Heredity: Inheritance and Variation of Traits – Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.</p> <p>HS-LS4-1 Biological Evolution: Unity and Diversity – Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.</p> <p>HS-ETS1-2 Engineering Design – Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p>		
Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)		

Middle Township Public Schools

Students will understand that...

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

Essential Questions : (What provocative questions will foster inquiry, understanding, and transfer of learning?)

1. What is the composition of blood?
2. How are blood types determined?
3. How are various sources of blood identified?
4. How are blood-spatter patterns created?

Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)

Students will know....

1. Blood is composed of red blood cells, white blood cells, and platelets.
2. Red blood cells transport oxygen to, and transport carbon dioxide away from, all parts of the body; white blood cells fight diseases; and platelets help blood clot.
3. Investigators can detect blood even after a scene has been cleaned.
4. Tests can determine if the blood is human, blood type, and a DNA profile.
5. Blood spatter patterns reveal the direction in which blood was traveling, the angle of impact of the weapon, and the point of origin of blood.
6. Blood analysis can recreate the sequence of events at a crime scene.

Students will be able to (do)...

1. Describe the composition of blood.
2. Describe the functions of blood cells.
3. Explain a brief history of the use of blood and blood-spatter analysis in forensics.
4. Describe how to determine the blood type of a sample of blood.
5. Describe how to screen for the presence of human blood.
6. Calculate the probability of certain blood types within a population.
7. Conduct a blood-spatter analysis.
8. Examine stab wounds and describe the nature of the weapon.
9. Use blood-spatter evidence to recreate the events at a crime scene.
10. Analyze a current case study related to the topic.

Key Vocabulary and Terms:

Middle Township Public Schools

Agglutination, Angle of Impact, Antibodies, Antigen, Antigen-Antibody Response, Area of Convergence, Area of Origin, Cast-Off Patterns, Passive Drop, Satellite, Spine, Swipe, Wipe		
Content Area:	Anatomy and Physiology	Grade(s) 10-12
Unit Plan Title:	Forensic Toxicology	
Unit Topics:	Evidence Detection, Collection, Storage, Reporting	
Standard(s) Number and Description (Established Goals)		
<p>HS-LS1-1 From Molecules to Organisms: Structures and Processes – 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.</p> <p>HS-LS3-1 Heredity: Inheritance and Variation of Traits – Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.</p> <p>HS-LS3-3 Heredity: Inheritance and Variation of Traits – Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.</p> <p>HS-LS4-1 Biological Evolution: Unity and Diversity – Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.</p> <p>HS-ETS1-2 Engineering Design – Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p>		
Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)		
<i>Students will understand that...</i>		
<ol style="list-style-type: none"> 1. Evidence is needed to determine the method by which a crime has been committed. 2. Forensic toxicology is a valuable tool in establishing the cause of death at a crime scene. 		
Essential Questions : (What provocative questions will foster inquiry, understanding, and transfer of learning?)		
<ol style="list-style-type: none"> 1. What are toxins? 		

Middle Township Public Schools

2. What are the five types of controlled substances?
3. What are the goals of toxicology?

Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)

Students will know....

1. Toxic substances include poisons, toxins, illegal drugs, and controlled drugs.
2. Toxicity depends on dose, duration, nature of exposure, interactions with other substances, and by-products of metabolism.
3. Exposure to poisonous and toxic substances, including arsenic, mercury, lead, toxic gases, pesticides, herbicides, and radiation, may occur naturally or deliberately.
4. Drugs can affect a person's health, mood, metabolism, perception of reality, and awareness,

Students will be able to (do)...

1. Identify the five types of controlled substances.
2. Give two examples of drugs in each of the five classes of controlled substances.
3. Relate signs and symptoms of overdose with a specific class of drugs or toxins.
4. Describe the role of various types of toxins in causing death.
5. Discuss agents that may be used in bioterrorism.
6. Define and describe the goals and practice of toxicology.
7. Analyze a current case study related to the topic.

Key Vocabulary and Terms:

Addiction, Controlled Substance, Controlled Substances Act, Dependency, Depressant, Hallucinogen, Illegal Drug, Narcotic, Poison, Stimulant, Tolerance, Toxicity, Toxicology, Toxin

Middle Township Public Schools

Content Area:	Forensics	Grade(s) 10-12
Unit Plan Title:	Handwriting Analysis, Forgery, and Counterfeiting	
Unit Topics:	Lab Safety, Witnesses, Innocence Project	
Standard(s) Number and Description (Established Goals)		
<p>HS-LS1-1 From Molecules to Organisms: Structures and Processes – 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.</p> <p>HS-LS3-1 Heredity: Inheritance and Variation of Traits – Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.</p> <p>HS-LS3-3 Heredity: Inheritance and Variation of Traits – Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.</p> <p>HS-LS4-1 Biological Evolution: Unity and Diversity – Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.</p> <p>HS-ETS1-2 Engineering Design – Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p>		
Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)		
<p><i>Students will understand that...</i></p> <ol style="list-style-type: none"> 1. Evidence is needed to determine the method by which a crime has been committed. 2. Document analysis is the examination and comparison of questioned documents with known material. 3. Counterfeiting involves the copying of false documents or other items for the purpose of deception. 		
Essential Questions : (What provocative questions will foster inquiry, understanding, and transfer of learning?)		
<ol style="list-style-type: none"> 1. What are the different characteristics of handwriting that experts analyze during a forensic investigation? 		

Middle Township Public Schools

2. What is an exemplar?
3. How is handwriting analyzed?
4. What is counterfeiting?

Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)

Students will know....

1. Document analysis is an area of forensics that compares questioned documents with authentic ones, which are called exemplars.
2. Handwriting is analyzed by examining the shape of the letters, and the use of connecting lines between letters.
3. To prevent check forgery, banks are changing how they print checks, and some are trying to eliminate paper checks all together.

Students will be able to (do)...

1. Describe twelve types of handwriting exemplars that can be analyzed in a document.
2. Demonstrate an example of five of the twelve exemplars of handwriting traits.
3. Identify the major goals of a forensic handwriting analysis.
4. Describe some of the technology used in handwriting analysis.
5. Distinguish between the terms forgery and fraudulence.
6. Identify several ways in which businesses prevent check forgery.
7. Describe four features of paper currency that are used to detect counterfeit bills.
8. Analyze a current case study related to the topic.

Key Vocabulary and Terms:

Counterfeiting, Currency, Document Expert, Exemplar, Forgery, Fraudulence, Questioned Document

Content Area:	Forensics	Grade(s) 10-12
Unit Plan Title:	Group Crime Scene Creation & Solving Project	
Unit Topics:	All Previous Topics	
Standard(s) Number and Description (Established Goals)		

Middle Township Public Schools

HS-LS1-1 From Molecules to Organisms: Structures and Processes – 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.

HS-LS3-1 Heredity: Inheritance and Variation of Traits – Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

HS-LS3-3 Heredity: Inheritance and Variation of Traits – Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

HS-LS4-1 Biological Evolution: Unity and Diversity – Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

HS-ETS1-2 Engineering Design – Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

Enduring Understandings: (What are the big ideas? What specific understandings about them are desired? What misunderstandings are predictable?)

Students will understand that...

1. Evidence is needed to determine the method by which a crime has been committed.
2. Investigators apply specific procedures and techniques to collect trace evidence.
3. 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.

Essential Questions : (What provocative questions will foster inquiry, understanding, and transfer of learning?)

1. How is a crime scene processed?
2. How is evidence collected and analyzed?

Middle Township Public Schools

3. What types of professionals and techniques are needed to process each type of evidence?

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

Student Learning Goals/Objectives: (What key knowledge and skills will students acquire as a result of this unit? What should they eventually be able to do as a result of such knowledge and skill?)

Students will know....

1. All previous knowledge

Students will be able to (do)...

1. Collect evidence using proper procedures.

2. Interview Witnesses

2. Analyze evidence with proper tools and techniques to determine the details surrounding the crime.

Key Vocabulary and Terms:

All previous terms.