



**MIDLAND PARK PUBLIC SCHOOLS**  
*Midland Park, New Jersey*  
**CURRICULUM**

# **Forensics**

**Prepared by:**  
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*Approved by the Midland Park Board of Education on  
August 16, 2016*

## **Forensics (Semester Course)**

### ***Course Description:***

Forensics is designed to investigate, collect data and solve crimes. Forensic scientists use chemistry, physics, biology, mathematics, engineering and even psychology to help solve crimes. Forensic science incorporates both science and the law. Forensic scientist document evidence from a crime scene, study the physical evidence, research and present evidence to detectives, police officers, lawyers and the court of law to help solve crimes. Students will learn the history of forensics, forensic methodologies and techniques, physical evidence detection and collection, forensic tools and analyzing data to link evidence to the criminal.

A guided inquiry program, problem-based learning experiences and engineering projects will give students the opportunity to explore topics and concepts through investigations. Participating in this hands-on program helps students:

1. To be prepared for College/Ca
2. Career by emphasizing key skills and practices (NGSS, CCSS, STEM).
3. Become lifelong learners and engaged citizens.

Suggested Course Sequence\*:

#### Unit 1

Forensics & the Law (12-14 days)

#### Unit 2

Fingerprints and Impressions (7-9 days)

#### Unit 3

The Crime Scene (10-12 days)

#### Unit 4

The Criminal Mind (15-16 days)

#### Unit 5

Hair & Fiber Evidence (9-10 days)

#### Unit 6

Handwriting Analysis (7-8 days)

#### Unit 7

Human Remains (17 days)

#### Unit 8

Blood & Blood Spatter (10 days)

#### Unit 9

Fire Investigation (5 days)

*\*The number of instructional days is an estimate based on the information available at this time. 1 day equals approximately 48 minutes of seat time. Teachers are strongly encouraged to review the entire unit of study carefully and collaboratively to determine whether adjustments to this estimate need to be made.*

## Unit Overview

**Content Area: Science**

**Unit Title: Introduction to Forensic Science and the Law**

**Grade Level: 11th/12th**

**Unit Summary: Introduce students to Forensic Science, branches of forensics, lab skills, laws that govern court evidence and ethical issues.**

**Interdisciplinary**

**Connections:**

**RST.11-12.1, WHST.9-12.7, WHST.11-12.8, WHST.11-12.9, WHST.9-12.2, SL.11-12.5**

**MP.2, MP.4, RST.9-10.7, HSN-Q.A.1, HSN-Q.A.2, HSN-Q.A.3**

**6.2.12.C.6.d**

**21<sup>st</sup> Century**

**Themes and Skills: CRP1, CRP2, CRP8, CRP10**

**Technology: 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.1**

## Learning Targets

**Standards (Content and Technology):**

<b>CPI#:</b>	<b>Statement:</b>
<b>6.3.12.D.1</b>	Analyze the impact of current governmental practices and laws affecting national security and/or individual civil rights/ privacy.
<b>HS-PS1-1</b>	Use a model to predict relationships between systems or between components of systems.
<b>HS-PS2-2</b>	Use mathematical representation of phenomena to describe explanations

**Unit Essential Question(s):**

- What is forensic science?
- What are the different careers in forensic science?
- How does Federal Law relate to evidence in crimes?

**Unit Enduring Understandings:**

- Careers in Forensic Science
- How forensic science determines what evidence to submit in court.
- How scientific method is utilized in solving crimes.

**Unit Learning Targets/Objectives:**

*Students will...*

- Compare and contrast the different careers in Forensic Science
- Explain forensics labs and how they work.
- Analyze evidence and predict what can be presented as evidence in court.

**Evidence of Learning**

**Formative Assessments: Tests, Careers Project with Rubric**

**Summative/Benchmark Assessment(s): Lab Report, Quiz, Case Studies, Q&A**

**Resources/Materials** (copy hyperlinks for digital resources):

*Forensic Science* by Richard Silverstein

*Forensics – Teachers A-Z Resource Guide*

Discovery Channel School Science Collections *Forensic Science*

Text - *Forensic Science and Forensics for Dummies*

*Forensic Science for High School* by Deslich & Funkhouser

**Modifications:** group problem solving, peer tutoring, modeling,

● **Special Education Students:**

● **At-Risk Students:**



- Hands on lab activity
- Cooperative learning
- Peer tutoring
- Extended time
- English Language Learners:
- Hands-on activities & explanations
- Assess comprehension through demonstration
- Give instructions/directions in writing & orally
- Use translation dictionaries to locate words in the native language

- Hands on activity
- cooperative learning
- reteach in various methods
- Gifted and Talented Students:
- Provide extension activities per student interest

### Lesson Plans

Lesson Name/ Topic	Lesson Objective(s)	Time frame (day(s) to complete)
	What is Forensic Science?	1 day
	Summarize the History of Forensic Science	1/2 day
	Methodology	1/2 day
	Discuss Criminal Justice and the Law	1 day
	Analyze Types of Crimes	1 day
	Explore Federal Law- Rules of Evidence	1 day
	Examine Forensic Science Careers and Specialties	3-4 days
	88 Minutes	2 days


**Teacher Notes:**

**Additional Resources**

Click links below to access additional resources used to design this unit:

[http://www.crimezzz.net/forensic\\_history/index.htm](http://www.crimezzz.net/forensic_history/index.htm)

Unit Overview
<b>Content Area: Science</b>
<b>Unit Title: Fingerprints &amp; Impressions</b>
<b>Grade Level: 11/12</b>
<b>Unit Summary: Differentiate the different types of fingerprints. Learn how to read a fingerprint. Discuss other types of identifying prints.</b>
<b>Interdisciplinary</b>
<b>Connections: RST.11-12.1, WHST.9-12.7, WHST.11-12.8, WHST.11-12.9, WHST.9-12.2, SL.11-12.5</b>
<b>MP.2, MP.4, RST.9-10.7, HSN-Q.A.1, HSN-Q.A.2, HSN-Q.A.3</b>
<b>21<sup>st</sup> Century</b>
<b>Themes and Skills: CRP1, CRP2, CRP8, CRP10, CRP11, CRP12</b>
<b>Technology</b>
<b>8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.1, 8.2.12.B.4, 8.1.12.D.5</b>

## Learning Targets

**Standards (Content and Technology):**

**CPI#:**

**Statement:**

**HS-LS3-3**

Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

**HS-LS4-3**

Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.

**Unit Essential Question(s):**

- How do forensic scientists utilize fingerprints?
- How are shoe and tire prints characterized?
- What types of impressions are utilized in forensics?

**Unit Enduring**

**Understandings:**

- Computers personal identification.
- Impression evidence
- Unique fingerprints

**Unit Learning Targets/Objectives:**

*Students will...*

- **Analyze the basic properties of fingerprints.**
  - Produce a readable set of fingerprint.
  - Recognize the patterns of fingerprints
  - Develop latent prints.
  - Evaluate prints.
  - Design and carry out scientific investigations.
  - Use technology and mathematics with fingerprinting.
  - Communicate and defend a scientific argument.

- **Relate different impressions as evidence**  
Using mathematics in forensics.

**Formative Assessments: Test, Project on Fingerprints**

**Summative/Benchmark Assessment(s): Lab Reports, Quiz, Q&A, homework**

**Resources/Materials** (copy hyperlinks for digital resources):

*Forensic Science* by Richard Silverstein

*Forensics – Teachers A-Z Resource Guide*

Discovery Channel School Science Collections *Forensic Science*

Text - *Forensic Science and Forensics for Dummies*

*Forensic Science for High School* by Deslich & Funkhouser

**Modifications: group problem solving, peer tutoring, modeling,**

● **Special Education Students:**

● Hands on lab activity

● Cooperative learning

● Peer tutoring

● Extended time

● **English Language Learners:**

● Hands-on activities & explanations

● Assess comprehension through demonstration

● Give instructions/directions in writing & orally

● Use translation dictionaries to locate words in the native language

● **At-Risk Students:**

● Hands on activity

● cooperative learning

● reteach in various

methods

● **Gifted and Talented Students:**

● Provide extension activities per student interest

### Lesson Plans

Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)



	<b>Discuss the History of Fingerprinting</b>	1 day
	<b>Compare &amp; Contrast types of fingerprints</b>	1 day
	<b>Identifying Fingerprints at the Crime Scene</b>	2 days
	<b>Examine Physical and Chemical Methods of Lifting Fingerprints</b>	1 day
	<b>Discuss other forms of identification-Biometrics</b>	1 day
	<b>Lab "Constructing Self-Fingerprints"</b>	1 day
	<b>Critique type of fingerprints from lab</b>	1-2 day

**Teacher Notes:**

**Additional Resources**

Click links below to access additional resources used to design this unit:

<http://www.fbi.gov/news/stories/2010/july/fingerprints/fingerprint-systems/>

[http://www.fbi.gov/news/stories/2010/march/biometrics\\_031110/delivering-the-future-the-biometric-center-of-excellence](http://www.fbi.gov/news/stories/2010/march/biometrics_031110/delivering-the-future-the-biometric-center-of-excellence)

### Unit Overview

**Content Area: Science**

**Unit Title: Types of Evidence and the Crime Scene**

**Grade Level: 11/12**

**Unit Summary: Evidence that can be gathered at a crime scene. Processing a crime scene.**

**Interdisciplinary**

**Connections: RST.11-12.1, WHST.9-12.7, WHST.11-12.8, WHST.11-12.9, WHST.9-12.2, SL.11-12.5**

**MP.2, MP.4, RST.9-10.7, HSN-Q.A.1, HSN-Q.A.2, HSN-Q.A.3**

**21<sup>st</sup> Century**

**Themes and Skills: CRP1, CRP2, CRP8, CRP10, CRP11, CRP12**

**Technology**

**8.1.12.F.1, 8.1.12.C.1, 8.2.12.B.4**

### Learning Targets

**Standards (Content and Technology):**

<b>CPI#:</b>	<b>Statement:</b>
6.3.12.D.1	Analyze the impact of current governmental practices and laws affecting national security and/or individual civil rights/ privacy.
HS-PS1-1	Use a model to predict relationships between systems or between components of systems.
HS-PS2-2	Use mathematical representation of phenomena to describe explanations


**Unit Essential Question(s):**

- What types of evidence is used in forensics?
- How is evidence collected?
- What processes occur at a crime scene?

**Unit Enduring Understandings:**

- Different Types of Evidence
- Evidence Collection
- Searching and securing a crime scene

**Unit Learning Targets/Objectives:**

*Students will...*

- Explain the difference between indirect and direct evidence.
- Describe physical evidence
- Compare class evidence vs. individual evidence
- Locate, evaluate and package evidence
- Create a sketching of a crime scene
- Justify the chain of custody at a crime scene

**Evidence of Learning**

**Formative Assessments:**

Test

**Summative/Benchmark Assessment(s):**

Lab Reports, Quiz, DVD Worksheet, Sketching a crime scene, Case Study, homework

**Resources/Materials (copy hyperlinks for digital resources):**

*Forensic Science* by Richard Silverstein

*Forensics – Teachers A-Z Resource Guide*

Discovery Channel School Science Collections *Forensic Science*

Text - *Forensic Science and Forensics for Dummies*

*Forensic Science for High School* by Deslich & Funkhouser

**Modifications: group problem solving, peer tutoring, modeling,**

- Special Education Students:
- Hands on lab activity

- At-Risk Students:
- Hands on activity

- Cooperative learning
- Peer tutoring
- Extended time
- English Language Learners:
- Hands-on activities & explanations
- Assess comprehension through demonstration
- Give instructions/directions in writing & orally
- Use translation dictionaries to locate words in the native language
- cooperative learning
- reteach in various methods
- Gifted and Talented Students:
- Provide extension activities per student interest

### Lesson Plans

Lesson Name/ Topic	Lesson Objective(s)	Time frame (day(s) to complete)
	Identify Evidence	1 day
	Distinguish between Testimonial or Direct Evidence	1 day
	Analyze the difference between Class or Individual Evidence	1 day
	Evaluating a Crime Scene	2 days
	Examine Chain of custody and processing a crime scene	1 day
	Sketching a model Crime Scene	2 days
	Deductive Reasoning	2 days
	Lovely Bones	2 days




**Teacher Notes:**

**Additional Resources**

Click links below to access additional resources used to design this unit:

<http://www.crime-scene-investigator.net/>

<http://www.fbi.gov/about-us/lab/handbook-of-forensic-services-pdf>

<http://www.feinc.net/sketch.htm>

<http://www.fbi.gov/about-us/lab/forensic-science-communications/fsc/july2000/deedric4.htm/>

<http://www.pathguy.com/autopsy.htm>

**Unit Overview**

**Content Area: Science**

**Unit Title: Fiber and Hair as Evidence**

**Grade Level: 11/12**

**Unit Summary: Fibers are used as circumstantial evidence to link the victim, suspect and crime scene.**

**Hair is used as class evidence and has probative value after analysis.**

**Interdisciplinary**

**Connections:**

**RST.11-12.1, WHST.9-12.7, WHST.11-12.8, WHST.11-12.9, WHST.9-12.2, SL.11-12.5**

MP.2, MP.4, RST.9-10.7, HSN-Q.A.1, HSN-Q.A.2, HSN-Q.A.3

21<sup>st</sup> Century

Themes and Skills: CRP1, CRP2, CRP8, CRP10, CRP11, CRP12

Technology:

8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.1, 8.2.12.B.4

### Learning Targets

Standards (Content and Technology):

CPI#:	Statement:
HS-PS1-1	Use a model to predict relationships between systems or between components of systems.
HS-PS2-2	Use mathematical representation of phenomena to describe explanations
HS-LS3-3	Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

**Unit Essential Question(s):**

- How are fibers used as trace evidence?
- How does hair relate to forensic science?

**Unit Enduring**

**Understandings:**

- Different types of fibers as evidence
- Different types of hair as evidence

**Unit Learning Targets/Objectives:**

*Students will...*

Identify different types of fibers.

- Categorize fibers as evidence
- Classifying fibers
- Describe the structure of a hair.
- Compare and contrast human vs. animal hair.

- Characteristics of hair important in forensics.
- Analyzing hair for environmental factors.

### Evidence of Learning

**Formative Assessments:**

Test

**Summative/Benchmark Assessment(s):**

Lab Reports

Quiz

Project

**Resources/Materials** (copy hyperlinks for digital resources):

*Forensic Science* by Richard Silverstein

*Forensics – Teachers A-Z Resource Guide*

Discovery Channel School Science Collections *Forensic Science*

Text - *Forensic Science and Forensics for Dummies*

*Forensic Science for High School* by Deslich & Funkhouser

**Modifications: group problem solving, peer tutoring, modeling,**

● **Special Education Students:**

- Hands on lab activity
- Cooperative learning
- Peer tutoring
- Extended time

● **English Language Learners:**

- Hands-on activities & explanations
- Assess comprehension through demonstration
- Give instructions/directions in writing & orally
- Use translation dictionaries to locate words in the native language

● **At-Risk Students:**

- Hands on activity
- cooperative learning
- reteach in various methods

● **Gifted and Talented Students:**

- Provide extension activities per student interest

### Lesson Plans

Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)

	<b>Identify Fibers as evidence</b>	2 days
	<b>Discuss Source and types of fibers</b>	1 day
	<b>Collecting Hair as evidence</b>	1 day
	<b>Analyze form and structure of hair</b>	1 day
	<b>Surveying the crime scene Collecting fiber/hair evidence</b>	2 days
<b>Lab</b>	<b>Classify hair as human or animal. Differentiate fiber types</b>	2 days
<b>Teacher Notes:</b>		
<b>Additional Resources</b> Click links below to access additional resources used to design this unit:		



## Unit Overview

Content Area: Science

Unit Title: Handwriting Analysis, Forgery and Counterfeiting

Grade Level: 11/12

Unit Summary: Analysis of handwriting, forgery and counterfeiting

Interdisciplinary

Connections: RST.11-12.1, WHST.9-12.7, WHST.11-12.8, WHST.11-12.9, WHST.9-12.2, SL.11-12.5

MP.2, MP.4, RST.9-10.7, HSN-Q.A.1, HSN-Q.A.2, HSN-Q.A.3

21<sup>st</sup> Century

Themes and Skills: CRP1, CRP2, CRP8, CRP10, CRP11, CRP12

Technology

8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.1, 8.2.12.B.4

## Learning Targets

Standards (Content and Technology):

CPI#:

Statement:

HS-LS4-4

Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

HS-PS2-2

Use mathematical representation of phenomena to describe explanations

Unit Essential Question(s):

- What do handwriting analyst look for?
- How can you tell if currency is counterfeit?

Unit Enduring

Understandings:

- Handwriting is characteristic to individuals.
- How handwriting and currency is analyzed.

**Unit Learning Targets/Objectives:**

*Students will...*

- Analyze different handwriting samples.
- Learn characteristics of handwriting.
- Compare different inks in documents.
- Analyze documents for forgery.
- Predict if currency is counterfeit.
- Examine currency.

**Evidence of Learning**

**Formative Assessments:**

Quiz, Identification of handwriting samples

**Summative/Benchmark Assessment(s):**

Worksheets

**Resources/Materials** (copy hyperlinks for digital resources):

*Forensic Science* by Richard Silverstein

*Forensics – Teachers A-Z Resource Guide*

Discovery Channel School Science Collections *Forensic Science*

Text - *Forensic Science and Forensics for Dummies*

*Forensic Science for High School* by Deslich & Funkhouser

**Modifications:** group problem solving, peer tutoring, modeling,

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• <b>Special Education Students:</b></li> <li>• Hands on lab activity</li> <li>• Cooperative learning</li> <li>• Peer tutoring</li> <li>• Extended time</li> </ul> | <ul style="list-style-type: none"> <li>• At-Risk Students:</li> <li>• Hands on activity</li> <li>• cooperative learning</li> <li>• reteach in various methods</li> </ul> |
| <ul style="list-style-type: none"> <li>• <b>English Language Learners:</b></li> <li>• Hands-on activities &amp; explanations</li> <li>• Assess comprehension through demonstration</li> </ul>             | <ul style="list-style-type: none"> <li>• Gifted and Talented Students:</li> </ul>  |



<b>Teacher Notes:</b>		
<b>Additional Resources</b> Click links below to access additional resources used to design this unit:  <a href="http://www.fbi.gov/about-us/lab/forensic-science-communications/fsc/oct2007/research/2007_10_research01_test1.htm">http://www.fbi.gov/about-us/lab/forensic-science-communications/fsc/oct2007/research/2007_10_research01_test1.htm</a> <a href="http://www.treas.gov/usss">www.treas.gov/usss</a>		

Unit Overview	
<b>Content Area: Science</b>	
<b>Unit Title: Human Remains</b>	
<b>Grade Level: 11/12</b>	
<b>Unit Summary: Identification of human remains and time of death utilizing various techniques.</b>  <b>Interdisciplinary</b> <b>Connections: RST.11-12.1, WHST.9-12.7, WHST.11-12.8, WHST.11-12.9, WHST.9-12.2, SL.11-12.5</b> <b>MP.2, MP.4, RST.9-10.7, HSN-Q.A.1, HSN-Q.A.2, HSN-Q.A.3</b>  <b>21<sup>st</sup> Century</b> <b>Themes and Skills: CRP1, CRP2, CRP8, CRP10, CRP11, CRP12</b>  <b>Technology</b> <b>8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.1, 8.2.12.B.4, 8.1.12.D.5</b>	
Learning Targets	
<b>Standards (Content and Technology):</b>	
<b>CPI#:</b>	<b>Statement:</b>



HS-LS4-4	Construct an explanation based on evidence for how natural selection leads to adaptation of populations.
HS-PS2-2	Use mathematical representation of phenomena to describe explanations
HS-LS3-3	Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.
HS-LS4-3	Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.
<b>Unit Essential Question(s):</b> <ul style="list-style-type: none"> <li>• How is a person identified from remains?</li> <li>• How is time of death determined?</li> </ul>	<b>Unit Enduring Understandings:</b> <ul style="list-style-type: none"> <li>· How forensic anthropologists determine sex, age, race and time of death from remains.</li> </ul>
<b>Unit Learning Targets/Objectives:</b> <i>Students will...</i> <ul style="list-style-type: none"> <li>· Distinguish between a male and female skeleton.</li> <li>· Determine whether bones are human or animal.</li> <li>· Identification marks on remains.</li> <li>· Predict race and sex.</li> <li>· Estimating time since death.</li> <li>· Predicting cause and manner of death.</li> </ul>	
<b>Evidence of Learning</b>	
<b>Formative Assessments:</b> Test Lab "Identification of Bones"	
<b>Summative/Benchmark Assessment(s):</b> Worksheets, Quiz, homework	

**Resources/Materials** (copy hyperlinks for digital resources):

*Forensic Science* by Richard Silverstein

*Forensics – Teachers A-Z Resource Guide*

Discovery Channel School Science Collections *Forensic Science*

Text - *Forensic Science and Forensics for Dummies*

*Forensic Science for High School* by Deslich & Funkhouser

**Modifications:** group problem solving, peer tutoring, modeling,

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>● <b>Special Education Students:</b></li> <li>● Hands on lab activity</li> <li>● Cooperative learning</li> <li>● Peer tutoring</li> <li>● Extended time</li> <br/> <li>● <b>English Language Learners:</b></li> <li>● Hands-on activities &amp; explanations</li> <li>● Assess comprehension through demonstration</li> <li>● Give instructions/directions in writing &amp; orally</li> <li>● Use translation dictionaries to locate words in the native language</li> </ul> | <ul style="list-style-type: none"> <li>● At-Risk Students:</li> <li>● Hands on activity</li> <li>● cooperative learning</li> <li>● reteach in various methods</li> <br/> <li>● Gifted and Talented Students:</li> <li>● Provide extension activities per student interest</li> </ul> |
|---|--|

### Lesson Plans

Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
	Investigating Human Remains	1 day
	The Post Mortem Interval: Determining the Time of Death	1 day
	Forensic Anthropology: Skeletal Remains	1 day
	The Skeleton	1/2 day
	Human vs. Animal Bones	1 day

	<b>Estimating Height Using Long Bones</b>	1/2 day
	<b>Differences in Skull Features Determining Sex, Age and Race</b>	1 day
<b>Lab</b>	<b>Bone Identification Lab</b>	3 days
	<b>Facial Reconstruction</b>	1/2 day
	<b>The Body Farm</b>	1 day
	<b>The Bone Collector</b>	2 days
<b>Teacher Notes:</b>		
<b>Additional Resources</b> Click links below to access additional resources used to design this unit:		

<b>Unit Overview</b>
<b>Content Area: Science</b>
<b>Unit Title: The Criminal Mind</b>
<b>Grade Level: 11/12</b>

**Unit Summary:** To peer into the criminal mind. Dealing with deception, sanity, profiling and MO of suspects. Tracking and defining serial offenders. Linking criminals and crime scenes.

**Interdisciplinary**

**Connections:**

RST.11-12.1, WHST.9-12.7, WHST.11-12.8, WHST.11-12.9, WHST.9-12.2, SL.11-12.5  
MP.2, MP.4, RST.9-10.7, HSN-Q.A.1, HSN-Q.A.2, HSN-Q.A.3

**21<sup>st</sup> Century**

**Themes and Skills:** CRP1, CRP2, CRP4, CRP6, CRP8, CRP11, CRP12

**Technology**

8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.1, 8.2.12.B.4, 8.1.12.A.1

**Learning Targets**

**Standards (Content and Technology):**

<b>CPI#:</b>	<b>Statement:</b>
HS-LS4-4	Construct an explanation based on evidence for how natural selection leads to adaptation of populations.
HS-PS2-2	Use mathematical representation of phenomena to describe explanations
HS-LS3-3	Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

**Unit Essential Question(s):**

- Are there common profiles for criminals?
- What causes someone to commit a crime?

**Unit Enduring Understandings:**

- Knowledge of how law enforcement tracks, profiles, determines suspect, and arrests suspect.
- Psyche of the mind of offenders.

**Unit Learning Targets/Objectives:**



*Students will...*

- Differentiate forensic vs. clinical psychiatry.
  - Record medical history.
  - Asking the right questions.
  - Recognizing lying and false confessions
  - Determining a defendant's competence
  - Classify multiple murderer
  - Assessing the perpetrator's psyche
  - Defining the killer's domain
  - Linking Criminals and Crime Scenes.
  - Generating profiles of perpetrator.

**Evidence of Learning**

**Formative Assessments:**

Test

Power point with rubric

**Summative/Benchmark Assessment(s):**

Quiz , Worksheets

**Resources/Materials** (copy hyperlinks for digital resources):

*Forensic Science* by Richard Silverstein

*Forensics – Teachers A-Z Resource Guide*

Discovery Channel School Science Collections *Forensic Science*

Text - *Forensic Science and Forensics for Dummies*

*Forensic Science for High School* by Deslich & Funkhouser

**Modifications:** group problem solving, peer tutoring, modeling,

- **Special Education Students:**
  - Hands on lab activity
  - Cooperative learning
  - Peer tutoring
  - Extended time
- **English Language Learners:**
  - Hands-on activities & explanations
  - Assess comprehension through demonstration
- **At-Risk Students:**
  - Hands on activity
  - cooperative learning
  - reteach in various methods
- **Gifted and Talented Students:**
  - Provide extension activities per student interest



- Give instructions/directions in writing & orally
- Use translation dictionaries to locate words in the native language

### Lesson Plans

Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
	Defining the role of the Forensic Psychiatric Professional	1 day
	Testing the Brain	1 day
	Questioning techniques	1 day
	Dealing with deception and sanity	1 day
	Tracking Offenders	1 day
	Motive Operandi	1 day
	Linking Criminals and Crime Scenes	3-4 days
	Project on Serial Offenders	6 days

<b>Teacher Notes:</b>		
<b>Additional Resources</b> Click links below to access additional resources used to design this unit:		

Unit Overview	
<b>Content Area: Science</b>	
<b>Unit Title: Blood and Blood Spatter</b>	
<b>Grade Level: 11/12</b>	
<p><b>Unit Summary:</b> Investigators often find blood at the scenes of crimes. They can use the location, distribution and pattern of blood and bloodstains to help reconstruct the crime. Blood evidence is analyzed for comparison DNA and utilized as court evidence.</p> <p><b>Interdisciplinary Connections:</b> RST.11-12.1, WHST.9-12.7, WHST.11-12.8, WHST.11-12.9, WHST.9-12.2, SL.11-12.5 MP.2, MP.4, RST.9-10.7, HSN-Q.A.1, HSN-Q.A.2, HSN-Q.A.3</p> <p><b>21<sup>st</sup> Century Themes and Skills:</b> CRP1, CRP2, CRP8, CRP10, CRP11, CRP12</p> <p><b>Technology</b> 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.1, 8.2.12.B.4</p>	

## Learning Targets

### Standards (Content and Technology):

CPI#:	Statement:
HS-PS1-1	Use a model to predict relationships between systems or between components of systems.
HS-PS2-2	Use mathematical representation of phenomena to describe explanations
HS-LS3-3	Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.
HS-LS4-2	Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.

### Unit Essential Question(s):

- How is blood used as evidence?
- What are the different types of blood?  
How does blood spatter determine where the crime occurred?

### Unit Enduring Understandings:

- Understand blood's characteristics.
- Analyze bloodstain patterns.

### Unit Learning Targets/Objectives:

*Students will...*

- Determine whether a stain is blood.
- Determine whether a bloodstain is human or animal blood.
- Understand blood types and clotting.
- Analyze blood spatters.
- Classify blood spatters.
- Reconstruct the crime scene from bloodstains.
- Use technology and mathematics to improve investigations and communications.

- Communicate and defend a scientific argument.

### Evidence of Learning

**Formative Assessments:**

Test

Problem Based Learning

**Summative/Benchmark Assessment(s):**

Lab, Worksheets

**Resources/Materials** (copy hyperlinks for digital resources):

[Forensic Science](#) by Richard Silverstein

[Forensics – Teachers A-Z Resource Guide](#),

Discovery Channel School Science Collections [Forensic Science](#)

**Modifications:** group problem solving, peer tutoring, modeling,

• **Special Education Students:**

- Hands on lab activity
- Cooperative learning
- Peer tutoring
- Extended time

• **English Language Learners:**

- Hands-on activities & explanations
- Assess comprehension through demonstration
- Give instructions/directions in writing & orally
- Use translation dictionaries to locate words in the native language

• **At-Risk Students:**

- Hands on activity
- cooperative learning
- reteach in various methods

• **Gifted and Talented Students:**

- Provide extension activities per student interest

### Lesson Plans

Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
	Blood at the Crime Scene	1 day

	<b>Human or Animal</b>	1 day
	<b>Serology</b>	1 day
<b>Lab</b>	<b>Blood Typing</b>	1 day
	<b>Blood Spatter Evidence</b>	1-2 days
<b>Lab</b>	<b>Blood Pattern Analysis</b>	2 days
	<b>DNA analysis</b>	2 days

**Teacher Notes:**

**Additional Resources**

Click links below to access additional resources used to design this unit:

- <http://www.crimescene-forensics.com/index.html>
- <http://www.pimall.com/nais/nl/n.bloodstains.html>
- <http://science.howstuffworks.com/bloodstain-pattern-analysis.html>

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## Unit Overview

**Content Area: Science**

**Unit Title: Forensic Aspects of Fire Investigation**

**Grade Level: 11/12**

**Unit Summary: Learn the characteristics of fire and how to determine if it is arson.**

**Interdisciplinary**

**Connections:**

RST.11-12.1, WHST.9-12.7, WHST.11-12.8, WHST.11-12.9, WHST.9-12.2, SL.11-12.5  
MP.2, MP.4, RST.9-10.7, HSN-Q.A.1, HSN-Q.A.2, HSN-Q.A.3

**21<sup>st</sup> Century**

**Themes and Skills: CRP1, CRP2, CRP8, CRP10, CRP11, CRP12**

**Technology**

**8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.1,**

## Learning Targets

**Standards (Content and Technology):**

<b>CPI#:</b>	<b>Statement:</b>
HS-PS1-1	Use a model to predict relationships between systems or between components of systems.
HS-PS3-1	Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known
HS-PS3-3	Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of and within a system.

<b>Unit Essential Question(s):</b> <ul style="list-style-type: none"> <li>· What is arson?</li> <li>· How is the source of arson determined?</li> </ul>	<b>Unit Enduring Understandings:</b> <ul style="list-style-type: none"> <li>· Determination of arson and the source of the fire.</li> </ul>	
<b>Unit Learning Targets/Objectives:</b> <i>Students will...</i> <ul style="list-style-type: none"> <li>· List the conditions necessary to initiate and sustain combustion.</li> <li>· Understand the three mechanisms of heat transfer.</li> <li>· Recognize the telltale signs of an accelerant-initiated fire.</li> <li>· Describe how to collect physical evidence at the scene of a suspected arson.</li> <li>· Identification of hydrocarbon residues in labs.</li> </ul>		
<b>Evidence of Learning</b>		
<b>Formative Assessments:</b> <b>Quiz</b>  <b>Summative/Benchmark Assessment(s):</b> <b>Worksheet</b>  <b>Resources/Materials</b> (copy hyperlinks for digital resources): <i>Forensic Science</i> by Richard Silverstein <i>Forensics – Teachers A-Z Resource Guide</i> Discovery Channel School Science Collections <i>Forensic Science</i> Text - <i>Forensic Science and Forensics for Dummies</i> <i>Forensic Science for High School</i> by Deslich & Funkhouser		
<b>Modifications: group problem solving, peer tutoring, modeling,</b> <ul style="list-style-type: none"> <li>● Special Education Students: <ul style="list-style-type: none"> <li>● Hands on lab activity</li> <li>● Cooperative learning</li> <li>● Peer tutoring</li> <li>● Extended time</li> </ul> </li> <li>● English Language Learners: <ul style="list-style-type: none"> <li>● At-Risk Students: <ul style="list-style-type: none"> <li>● Hands on activity</li> <li>● cooperative learning</li> <li>● reteach in various methods</li> </ul> </li> <li>● Gifted and Talented Students: <ul style="list-style-type: none"> <li>● Provide extension activities per student interest</li> </ul> </li> </ul> </li> </ul>		

- Hands-on activities & explanations
- Assess comprehension through demonstration
- Give instructions/directions in writing & orally
- Use translation dictionaries to locate words in the native language

**Lesson Plans**

Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
	Forensic Investigation of Arson	1 day
	Chemistry of Fire	1 day
	Searching the Fire Scene	1 day
	Collection and Preservation of Arson Evidence Analysis of Flammable Residues	1 day
	Ladder 49	2 days


**Teacher Notes:**

**Additional Resources**

Click links below to access additional resources used to design this unit:

<http://www.tforensic.com.au/docs/article3.html>

<https://www.ncjrs.gov/pdffiles1/nij/181584.pdf>

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