# Unit 1- Intro to Forensics

Content Area: **Science**
Course(s): **Forensics Science (s)**
Time Period: **1st Marking Period**
Length: **2 weeks**
Status: **Not Published**

## Summary of the Unit

Forensic science is the application of sciences such as physics, chemistry, biology, computer science and engineering to matters of law. Forensic science plays an important role in the criminal justice system by providing scientifically based information through the analysis of physical evidence, medical evidence, and eyewitness evidence.This unit will introduce students to what Forensic Science is along with the main ideas about working a crime scene. These main idea topics include what is forensics, eyewitness basics, physical evidence, and medical evidence. Within in What is Forensics, students will learn about the History of the FBI Crime Lab, what jobs are available in the field, education required, and key terminology. Eyewitness Basics will entail teaching the students the power of observation and how these observations can be exaggerated, or not entirely correct. Students will also learn how to become good eyewitnesses themselves by practicing observing and then reporting what they saw or heard. Physical evidence will focus on proper collection and chain of evidence. It will also include key terminology. While learning about medical evidence, students will be given information about key terms like rigor mortis, time of death, temperature, insects, stomach contents, etc. one of the activities will include analyzing stomach contents to determine what restaurant was eaten at before death.

## Enduring Understandings

- What is Forensic Science
- The Importance of an Eyewitness
- The Importance of Physical Evidence
- The Importance of Medical Evidence

## Essential Questions

**What is Forensic Science**

What is a specific education necessary to be a forensic scientist

What educational background is needed

What jobs are available

Why is Forensics Science important to solving crimes

**The Importance of an Eyewitness**

What is an observation

How can an eyewitness be helpful or harmful

What are basic questions to ask an eyewitness

**The Importance of Physical Evidence**

What is physical evidence

How should physical evidence be collected

How can physical evidence collection cause the evidence not to be used

**Medical Evidence**

What is medical evidence

What are the types of medical evidence

What can medical evidence tell you

How is medical evidence properly collected

## Summative Assessment and/or Summative Criteria

- Quizzes
- Worksheets
- Webquests
- Lab Activities
- Guided Notes

## Resources

- FBI Crime Lab Video and Questions
- Forensic Challenge A-Z word search and fill in
- Forensic Science Unit 1 Quiz
- Notes with student guided notes
- CSI Webquest
- Unit Review Crossword
- Death Meaning and Manner Reading packet with questions
- Death Lab #2 problems 1, 2, 3
- Murder and a Meal Lab
- Food Science Lab

- Textbook/Textbook worksheets
- Labs
- Centers
- Escape Rooms
- Science Videos
- Mosa Mack
- Discovery Education
- BrainPop
- Achieve 3000

## Unit Plan

| Topic/Selection Timeframe | General Objectives | Instructional Activities | Benchmarks/Assessm |
|---|---|---|---|
| What is Forensics/1 week | SWBAT identify the importance of Forensic Science in solving crimes and other problems | FBI Crime Lab Video and Questions<br>Forensic Challenge A-Z | Quiz |
| Eyewitness Basics | SWBAT analyze and identify proper eyewitness interviewing techniques and determine validity of eyewitness information | Guided Notes<br>CSI Webquest<br>Observation Challenges | Guided Notes<br>Webquest<br>Challenges |

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| Physical Evidene | SWBAT analyze and identify proper physical evidence collection techniques and the importance of physical evidence<br>SWBAT evaluate physical evidence to infer causes of death or details about a crime scene | Guided Notes<br>Practice Labs of evidence collection | Guided Notes<br>Class Discussion |
| Medical Evidence | SWBAT define medical terminology<br>SWBAT evaluate medical | Death Meaning and Manner reading and questions<br>Death Lab Scenarios #2 | Guided Notes<br>Reading Questions<br>Lab Outcomes |

| | | | |
|---|---|---|---|
| | evidence to infer causes of death and other peripheral information surrounding death | Murder and a Meal Mystery<br>Food Science | |

## Suggested Modifications for Special Education, ELL and Gifted Students

Follow all IEP's and 504 plans exactly as written

Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.

- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).

- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Restructure lesson using UDL principals

## Suggested Technological Innovations/Use

- Discovery Education
- Mosa Mack
- BrainPop
- Achieve 3000

## Cross Curricular/21st Century Connections

English Language Arts

- Cite specific textual evidence to support analysis of science and technical texts that provide evidence for how the body is a system of interacting subsystems composed of cells.
- Trace and evaluate a text's argument that the body is a system of interacting subsystems composed of cells, distinguishing claims that are supported by reasons and evidence from claims that are not.
- Write arguments, supported by evidence, for how the body is a system of interacting subsystems composed of groups of cells.
- Gather relevant information concerning how sensory receptors function by responding to stimuli, then sending messages to the brain, which responds immediately through some form or behavior or by storing the message

Mathematics - N/A

Science

- Structure and Function

Engineering

- Defining the problem to determine possible solutions
- Experimenting
- Analyzing and interpreting data

Technology

- Use the Internet to explore, complete webquests,  and research
- Use on line applications
- Create documents using Google Docs and Slides

# Unit 2 - DNA

Content Area: **Science**
Course(s): **Forensics Science (s)**
Time Period: **1st Marking Period**
Length: **1 1/2 weeks**
Status: **Not Published**

## Summary of the Unit

Since each person's DNA is different, DNA collected from crime scenes can either implicate or eliminate suspects. In this unit, students will be taught foundational information about DNA that will be not only be applicable to Forensics, but also Life Science. Students will first learn what DNA is, where it is located within the cell, base pairs, and that DNA is different person to person. Identical twins will also be discussed in terms of DNA and crime scenes. Students will learn what a DNA profile is, and shown several pictures of DNA profiles for comparisions and to solve cases. Students will than be introduced to what DNA evidence is, and how it is useful in Forensics. Students will learn that DNA can be taken from skin, nails, hair, bodily fluids, etc. and used to for various reasons in Forensics. The unit will also discuss the new trend of DNA Genealogy testing from places like 23 and Me and Ancestry to discuss ways in which cold cases are being solved as a result of individuals or relatives matching DNA in old files that were previously unidentified.

## Enduring Understandings

- What is DNA, structure and function
- DNA is specific to individuals
- How DNA is used in Forensics
- How to collect and test samples
- How to use samples to analyze findings

## Essential Questions

- What is the structure and function of DNA?
- How can DNA be used to implicate or eliminate someone as a suspect?
- How is DNA collected from a crime scene?
- How can DNA be tested and analyzed to gather information?

## Summative Assessment and/or Summative Criteria

- Quizzes
- Worksheets
- Webquests
- Lab Activities

- Guided Notes

## Resources

- Textbook/Textbook worksheets
- Labs
- Centers
- Escape Rooms
- Science Videos
- Mosa Mack
- Discovery Education
- BrainPop
- Achieve 3000
- Guided notes
- CSI webquest pg. 1
- DNA evidence handout
- Kiwi DNA lab
- DNA databases like Ancestry
- Biointeractives cases: Earthquake and Switched at Birth
- Articles
- Who robbed the Bank activity

## Unit Plan

| Topic/Selection Timeframe | General Objectives | Instructional Activities | Benchmarks/As |
|---|---|---|---|
| | | | |
| | | Thirty years of DNA forensics: How DNA has revolutionized criminal investigations<br>https://cen.acs.org/articles/95/i37/Thirty-years-DNA-forensics-DNA.html<br><br>Article: NJ National Institute of Justice: DNA Evidence: Basics of Identifying, Gathering and Transporting<br>https://www.nij.gov/topics/forensics/evidence/dna/basics/pages/identifying-to-transporting.aspx | |
| | | It started as a hobby. Now they're using DNA to help cops crack cold cases | |

## Suggested Modifications for Special Education, ELL and Gifted Students

Follow all IEP's and 504 plans exactly as written

Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.

- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Restructure lesson using UDL principals

## Suggested Technological Innovations/Use

- Discovery Education
- Mosa Mack
- BrainPop
- Achieve 3000

## Cross Curricular/21st Century Connections

English Language Arts

- Cite specific textual evidence to support analysis of science and technical texts that provide evidence for how the body is a system of interacting subsystems composed of cells.
- Trace and evaluate a text's argument that the body is a system of interacting subsystems composed of cells, distinguishing claims that are supported by reasons and evidence from claims that are not.
- Write arguments, supported by evidence, for how the body is a system of interacting subsystems composed of groups of cells.
- Gather relevant information concerning how sensory receptors function by responding to stimuli, then sending messages to the brain, which responds immediately through some form or behavior or by storing the message

Science

- Structure and Function

Engineering

- Defining the problem to determine possible solutions
- Experimenting
- Analyzing and interpreting data

Technology

- Use the Internet to explore, complete webquests,  and research
- Use on line applications
- Create documents using Google Docs and Slides

# Unit 3- Fingerprints

Content Area: **Science**
Course(s): **Forensics Science (s)**
Time Period: **1st Marking Period**
Length: **2 weeks**
Status: **Not Published**

## Summary of the Unit

Fingers of a person contain small ridges to allow for the gripping of objects. Although genetic in nature, these ridges form while a fetus is developing in the womb, creating a pattern that is unique to each individual.In this unit students will learn how to use these unique prints for identification purposes. Students will begin by learning the major identifying features of finger prints: arch, loop, and whorl. Students will also learn how to identify more detailed features, such as the core, bifurcation, abrupt ending, cicatrix, delta, etc. Next, students will use fingerprint identification cards and ink pads to collect their own prints for the purpose of identifying their own detailed, unique features of their fingerprints. Students will than learn the technique of lifting finger prints with powder, brush and tape. To demonstrate technique, students will lift unknown prints for comparison against identified prints to determine who the prints belong to in class along with various other challenges.

## Enduring Understandings

- A finger print is unique
- identifying features of a fingerprint
- How to lift prints with ink pads and tape
- How to analyze and identify fingerprints

## Essential Questions

- Why is a fingerprint unique?
- What do the main features/details of a fingerprint look like?
- How can ink pads, powder, and tape be used to lift a fingerprint
- How can lifted prints be analyzed for identification and to help solve crimes?

## Summative Assessment and/or Summative Criteria

- Quizzes
- Worksheets
- Webquests
- Lab Activities
- Guided Notes

## Resources

- Textbook/Textbook worksheets
- Labs
- Centers
- Escape Rooms
- Science Videos
- Mosa Mack
- Discovery Education
- BrainPop
- Achieve 3000
- Guided notes
- Articles
- Lifting Prints Activity
- Fingerprint Challenges

## Unit Plan

| Topic/Selection Timeframe | General Objectives | Instructional Activities | Benchmarks/Assessm |
|---|---|---|---|
| | | | |
| Identifying features of a fingerprint<br>3 days | SWBAT identify the identifying structures of a fingerprint. | Guided Notes Fingerprinting Article pgs 3-4<br>Finger Print Challenges<br>Finger Print Analysis Activity<br>Finger Print Identification Poster Sets | Challenge outcomes<br>Analysis Activity |

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| Lifting Prints for analysis 6 days | SWBAT lift prints using various techniques to analyze and identify the owners of the prints | Fingerprint Article pgs. 2, 5-6<br>page 2- ink pad lifting to identification cards<br>applicant cards for prints<br>pgs.5-6 dusting with tape<br>Whose Fingerprints Where Left Behind Kit | Print lifting activity technique and outcom |

## Suggested Modifications for Special Education, ELL and Gifted Students

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- Provide ELL students with multiple literacy strategies.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Restructure lesson using UDL principals

## Suggested Technological Innovations/Use

- Discovery Education
- Mosa Mack
- BrainPop
- Achieve 3000
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## Cross Curricular/21st Century Connections

English Language Arts

- Cite specific textual evidence to support analysis of science and technical texts that provide evidence for how the body is a system of interacting subsystems composed of cells.
- Trace and evaluate a text's argument that the body is a system of interacting subsystems composed of cells, distinguishing claims that are supported by reasons and evidence from claims that are not.
- Write arguments, supported by evidence, for how the body is a system of interacting subsystems composed of groups of cells.
- Gather relevant information concerning how sensory receptors function by responding to stimuli, then sending messages to the brain, which responds immediately through some form or behavior or by storing the message

Science

- Structure and Function

Engineering

- Defining the problem to determine possible solutions
- Experimenting
- Analyzing and interpreting data

Technology

- Use the Internet to explore, complete webquests,  and research
- Use on line applications
- Create documents using Google Docs and Slides
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# Unit 4 - Anthropology

Content Area: **Science**
Course(s): **Forensics Science (s)**
Time Period: **1st Marking Period**
Length: **1 Week**
Status: **Not Published**

## Summary of the Unit

Students develop a basic understanding of what the study of anthropology is and why it is important. Students will construct explanations on how anthropology relates to the field of forensics and how scientists use the evidence to connect human biological and physiological features to their evolution and ultimately, make conclusions for forensic decisions.

## Enduring Understandings

- Calculating height of an individual's activity
- Human skeleton diagram
- Virtual skeleton identification

## Essential Questions

- What role do anthropologists play in solving crimes?
- What does a physical anthropologist investigate?
- What techniques or tools did the scientists use to find the body?
- What information do they provide for law enforcement agencies?

## Summative Assessment and/or Summative Criteria

- Skeleton Identification Lab
- Quiz/Test Assessment

## Resources

- Textbook/Textbook worksheets
- Labs

- Centers
- Escape Rooms
- Science Videos
- Mosa Mack
- Discovery Education
- BrainPop
- Achieve 3000

## Unit Plan

| Topic/Selection Timeframe | General Objectives | Instructional Activities | Benchmarks/Asse |
|---|---|---|---|
| | • Identify the role that anthropologists play in solving crimes. | • Forensic anthropology video and associated questions<br>• Human skeleton labeling<br>• Calculating the height of an individual<br>• Virtual skeleton Identification | Department created un assessments<br>Video questions<br>Project rubrics<br>Mosa Mack "make" an "engineer" rubrics<br>Lab and lab journals |
| | • Identify the evidence that a physical anthropologist investigate.<br>• Identify the techniques and tools used by scientists to find and identify a body. | • Forensic anthropology video and associated questions<br>• Human skeleton labeling<br>• Calculating the height of an individual<br>• Virtual skeleton Identification | Department created un assessments<br>Video questions<br>Project rubrics<br>Mosa Mack "make" an |

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| | | | "engineer" rubrics<br><br>Lab and lab journals |
| | • | • Forensic anthropology video and associated questions<br>• Human skeleton labeling<br>• Calculating the height of an individual<br>• Virtual skeleton Identification | Department created un assessments<br><br>Video questions<br><br>Project rubrics<br><br>Mosa Mack "make" an "engineer" rubrics<br><br>Lab and lab journals |

## Suggested Modifications for Special Education, ELL and Gifted Students

Structure lessons around questions that are authentic, relate to students' interests, social/family background

and knowledge of their community.

- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Restructure lesson using UDL principals

## Suggested Technological Innovations/Use

- Discovery Education
- Mosa Mack
- BrainPop
- Achieve 3000

## Cross Curricular/21st Century Connections

English Language Arts

- Cite specific textual evidence to support analysis of science and technical texts that provide evidence for how the body is a system of interacting subsystems composed of cells.
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- Write arguments, supported by evidence, for how the body is a system of interacting subsystems composed of groups of cells.

- Gather relevant information concerning how sensory receptors function by responding to stimuli, then sending messages to the brain, which responds immediately through some form or behavior or by storing the message

Mathematics - N/A

# Unit 5- Entomology

Content Area: **Science**
Course(s): **Forensics Science (s)**
Time Period: **1st Marking Period**
Length: **1-2 weeks**
Status: **Not Published**

## Summary of the Unit

Forensic Entomology is the study of insets, their life cycles and their behavior to collect information and clues about a crime. This requires the ability to identify insects and their life cycles, and how to collect and preserve specimens. Additionally, these scientists also need to be observant of not only insect evidence but also weather, location, and the condition bodies and other evidence have been found. In this unit students will learn how to identify insects and learn about their life cycles as they relate to crimes. Students will also learn to analyze weather factors such as: air temp, ground temp, and precipitation in relationship to insect growth and evidence breakdown.Students will be presented with different scenarios and case studies to make conclusions based on entomological evidence analysis.

## Enduring Understandings

- How is Forensic Entomology used to solve crimes
- Insect Identification and Life Cycles
- Technique to analyze insect and abiotic factors to make inferences

## Essential Questions

- How is Forensic Entomology used to solve crimes?
- What can be inferred about the types of insects at a crime scene or on a body?
- What can be inferred about the stage of life insects are in at a crime scene or on a body?
- How can abiotic factors such as: air temp, ground temp, and precipitation influence the rate of insect colonization and growth at a crime scence or on a body?

## Summative Assessment and/or Summative Criteria

- Quizzes
- Worksheets
- Webquests
- Lab Activities
- Guided Notes

## Resources

- Textbook/Textbook worksheets
- Labs
- Centers
- Escape Rooms
- Science Videos
- Mosa Mack
- Discovery Education
- BrainPop
- Achieve 3000
- Guided notes
- Articles
- Forensics Entomology Crossword & Unit Review
- Insect Identification Cards
- Crime Solving Insect Info and Scenarios
- Forensic Science: Fundamentals & Investigations Activity Handout #'s 4-6
- Forensic Entomology Kits

## Unit Plan

| Topic/Selection Timeframe | General Objectives | Instructional Activities | Benchmarks/Assessm |
|---|---|---|---|
| What is Forensic Entomology? 1 day | SWBAT define Forensic Entomology and describes its importance to solving crimes | Guided notes<br>Google Slides | guided notes |
| What are abiotic factors? How do they influence insect colonization? | SWBAT list and describe abiotic factors.<br><br>SWBAT infer how abiotic factors influence insect | Forensics Entomology Crossword & Unit Review<br>Insect Identification Cards | crossword<br>unit review |

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| 2 days | colonization of a crime scene | | |
| How can analyzing insects and their life stages along with abiotic factors help solve crimes?<br>5-6 days | SWBAT identity common insects and describe their life cycles<br><br>SWBAT evaluate insects and abiotic factors to make determinations about crime scenes. | Crime Solving Insect Info and Scenarios<br>Forensic Science: Fundamentals & Investigations Activity Handout #'s 4-6<br>Forensic Entomology Kits | outcomes of scenarios<br>activity handout #'s 4-6<br>outcomes of kit activiti |

## Suggested Modifications for Special Education, ELL and Gifted Students

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- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple

entry points and multiple ways to demonstrate their understandings.

- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Restructure lesson using UDL principals

## Suggested Technological Innovations/Use

- Discovery Education
- Mosa Mack
- BrainPop
- Achieve 3000
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## Cross Curricular/21st Century Connections

English Language Arts

- Cite specific textual evidence to support analysis of science and technical texts that provide evidence for how the body is a system of interacting subsystems composed of cells.
- Trace and evaluate a text's argument that the body is a system of interacting subsystems composed of cells, distinguishing claims that are supported by reasons and evidence from claims that are not.
- Write arguments, supported by evidence, for how the body is a system of interacting subsystems composed of groups of cells.
- Gather relevant information concerning how sensory receptors function by responding to stimuli, then sending messages to the brain, which responds immediately through some form or behavior or by storing the message

Science

- Structure and Function
- Animals engage in characteristic behaviors that increase the odds of reproduction.

Engineering

- Defining the problem to determine possible solutions
- Experimenting
- Analyzing and interpreting data

Technology

- Use the Internet to explore, complete webquests,  and research
- Use on line applications
- Create documents using Google Docs and Slides

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# Unit 6 - Ink and Handwriting

Content Area: **Science**
Course(s): **Forensics Science (s)**
Time Period: **1st Marking Period**
Length: **2 weeks**
Status: **Not Published**

## Summary of the Unit

Since each person's handwriting is different, handwriting samples are collected from crime scenes can either implicate or eliminate suspects. In this unit, students will be taught foundational information about handwriting samples and letter formation and how each differs from person to person. Students will first learn how handwriting and letter formation occurs and differences to look for within each letter. Students will learn what chromatography is, and will be shown several examples of chromatography basics. Students will learn how ink analsyis can be used to identify writing utensils which are used in different notes and letters, which can lead to evidence in a crome scene.

## Enduring Understandings

- What is  chromatography
- How are handwriting and letter formation specific to individuals
- How Ink analysis and handwriting is used in forensics and crime investigation
- How to collect and test samples
- How to use samples to analyze findings

## Essential Questions

- What is the function of chromatography?
- How can ink analysis, handwriting and letter formation be used to implicate or eliminate someone as a suspect?
- How are handwriting samples collected from a crime scene?
- How can ink be tested and analyzed to gather information?
- How can handwriting samples be tested and analyzed to gather information?

## Summative Assessment and/or Summative Criteria

- Quizzes
- Worksheets
- Webquests
- Lab Activities
- Guided Note
- Textbook/Textbook worksheets

- Centers
- Escape Rooms
- Science Videos
- Mosa Mack
- Discovery Education
- BrainPop
- Achieve 3000

## Resources

- Textbook/Textbook worksheets
- Labs
- Centers
- Escape Rooms
- Science Videos
- Mosa Mack
- Discovery Education
- BrainPop
- Achieve 3000
- Guided notes
- Articles
- Forensics Crossword & Unit Review
- Forensic Science: Fundamentals & Investigations Activity Handout

## Unit Plan

| Topic/Selection Timeframe | General Objectives | Instructional Activities | Benchmarks/Asse |
|---|---|---|---|
| | • Identify the components of chromatology and give examples of chromatology<br>• Identify how mixtures and solution assist in the science of chromatology | Students will complete the following:<br>• Paper chromatology lab<br>• Chromatology Challenge | • Lab report<br>• Challenge questions |

| | | | |
|---|---|---|---|
| Ink Analysis | • Identify how ink identification and analysis assists in forensic science analysis | • Complete "The Parting of Pen" lab<br>• Analyze the ink from a written note | • Lab report |
| Handwriting Analysis | • Demonstrate how handwriting is unique to each individual by analyzing handwriting samples | • Handwriting Analysis Lab | • Lab report |

## Suggested Modifications for Special Education, ELL and Gifted Students

Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.

- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables,

multimedia, modeling).

- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Restructure lesson using UDL principals

## Suggested Technological Innovations/Use

- Discovery Education
- Mosa Mack
- BrainPop
- Achieve 3000

## Cross Curricular/21st Century Connections

English Language Arts

- Cite specific textual evidence to support analysis of science and technical texts that provide evidence for how each individual has their own specific handwriting and letter formation.
- Trace and evaluate a text's argument that the brain is source in which letter formation and handwriting is started.
- Analyze texts which support the science of chromotology and handwriting analysis.

Mathematics - N/A

# Unit 7 - Hair and Fiber

Content Area: **Science**
Course(s): **Forensics Science (s)**
Time Period: **1st Marking Period**
Length: **1 week**
Status: **Not Published**

## Summary of the Unit

Since each person's DNA is unique, hair samples are collected from crime scenes can either implicate or eliminate suspects. In this unit, students will be taught foundational information about hair samples and the testing of the protein keratin which is the primary component of hair, finger nails and toe nails. In order to test hair for nuclear DNA, the root of the hair must be present. The hair may also be tested using mitochondrial DNA even if the root is not present.

Fiber evidence can be found at crime scenes in a number of different ways. In personal cotnact between the clothing of a suspect and a victim, cross-transfer can occur. In a break-in, fibers can become fixed to window screens or broken glass. If a fight occurs, fibers can become fied to a number of objects. In an auto accident, fibers, threads oe even pieces of clothing may adhere to parts to the vehicle. Several different tests may be performed on fibers in order to determine if they belong to a suspect or victim and whether or not they were placed there during the time that the crime took place.

## Enduring Understandings

- What is hair and fiber analysis
- How are hair and fiber samples specific to individuals
- How hair and fiber samples are used in forensics and crime investigation
- How to collect and test samples
- How to use samples to analyze findings

## Essential Questions

- What is the function of hair and fiber analysis?
- How can hair and/or fiber analysis be used to implicate or eliminate someone as a suspect?
- How are samples collected from a crime scene?
- How can hair and fiber be tested and analyzed to gather information?

## Summative Assessment and/or Summative Criteria

- Quizzes
- Worksheets
- Webquests
- Lab Activities
- Guided Note
- Textbook/Textbook worksheets
- Centers
- Escape Rooms
- Science Videos
- Mosa Mack
- Discovery Education
- BrainPop
- Achieve 3000

## Resources

- Textbook/Textbook worksheets
- Labs
- Centers
- Escape Rooms
- Science Videos
- Mosa Mack
- Discovery Education
- BrainPop
- Achieve 3000
- Guided notes
- Articles
- Forensics Crossword & Unit Review
- Forensic Science: Fundamentals & Investigations Activity Handout

## Unit Plan

| Topic/Selection Timeframe | General Objectives | Instructional Activities | Benchmarks/Asse |
|---|---|---|---|
| Hair Analysis | Identify the characteristics of the biology of hair including the cuticle which may be important in | Complet Hair Evidence Lab | Lab Report |

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|---|---|---|---|
| | distinguishing between hairs of different species and the structure of hair with regard to thickness, texture and color. | | |
| Fiber Analysis | Identify the characteristics of a fiber which is the smallest unit of textile material that has length that is many times greater than its diameter. Distinguish between natural and manmade or synthetic fibers. | COmplete Fiber Analysis Lab | Lab Report |
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## Suggested Modifications for Special Education, ELL and Gifted Students

Structure lessons around questions that are authentic, relate to students' interests, social/family background

and knowledge of their community.

- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Restructure lesson using UDL principals

## Suggested Technological Innovations/Use

- Discovery Education
- Mosa Mack
- BrainPop
- Achieve 3000

## Cross Curricular/21st Century Connections

English Language Arts

- Cite specific textual evidence to support analysis of science and technical texts that provide evidence for how each individual has their own specific DNA and how that can be extracted from hair follicles.
- Trace and evaluate a text's argument regarding hair analysis and DNA.
- Analyze texts which support the science of hair and fiber analysis.

- Mathematics - N/A

# Unit 8 - Powder Analysis

Content Area: **Science**
Course(s): **Forensics Science (s)**
Time Period: **1st Marking Period**
Length: **1 week**
Status: **Not Published**

## Summary of the Unit

Powder analysis at a crime scence can be a key piece of evidence. It is important to determine if it is legal or not. The powder is identified using chemistry of the unknown powder.

## Enduring Understandings

- What is powder analysis
- How is powder analysis used to in crime investigation.
- How to collect and test samples
- How to use samples to analyze findings

## Essential Questions

- What is the function of powder analysis?
- How can powder analysis be used to implicate or eliminate someone as a suspect?
- How are samples collected from a crime scene?
- How can powder be tested and analyzed to gather information?

## Summative Assessment and/or Summative Criteria

- Quizzes
- Worksheets
- Webquests
- Lab Activities
- Guided Note
- Textbook/Textbook worksheets
- Centers
- Escape Rooms
- Science Videos
- Mosa Mack
- Discovery Education

- BrainPop
- Achieve 3000

## Resources

- Textbook/Textbook worksheets
- Labs
- Centers
- Escape Rooms
- Science Videos
- Mosa Mack
- Discovery Education
- BrainPop
- Achieve 3000
- Guided notes
- Articles
- Forensics Crossword & Unit Review
- Forensic Science: Fundamentals & Investigations Activity Handout

## Unit Plan

| Topic/Selection Timeframe | General Objectives | Instructional Activities | Benchmarks/Asse |
|---|---|---|---|
| Powder Analysis | Test, compare and analyze the results of an unknown powder substance | • Powder Analysis Lab and Powerful Powderers Lab<br>• Case of the Christmas Cookie Mystery | Lab Reports |

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## Suggested Modifications for Special Education, ELL and Gifted Students

Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.

- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Restructure lesson using UDL principals

## Suggested Technological Innovations/Use

- Discovery Education
- Mosa Mack
- BrainPop
- Achieve 3000

## Cross Curricular/21st Century Connections

English Language Arts

- Cite specific textual evidence to support analysis of science and technical texts that provide evidence for how the body is a system of interacting subsystems composed of cells.
- Trace and evaluate a text's argument that the body is a system of interacting subsystems composed of cells, distinguishing claims that are supported by reasons and evidence from claims that are not.
- Write arguments, supported by evidence, for how the body is a system of interacting subsystems composed of groups of cells.
- Gather relevant information concerning how sensory receptors function by responding to stimuli, then sending messages to the brain, which responds immediately through some form or behavior or by storing the message

Science

- Structure and Function

Engineering

- Defining the problem to determine possible solutions
- Experimenting
- Analyzing and interpreting data

Technology

- Use the Internet to explore, complete webquests,  and research
- Use on line applications
- Create documents using Google Docs and Slides
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