

Forensic Science

**Unit: Introduction to Forensics**  
 Essential Questions  
**What is Forensic Science?**  
**What is deductive reasoning**  
**What is the Federal Crime lab?**  
**What services does the Federal Crime lab offer?**  
**What is the job of a Forensic scientist?**  
**What are other Forensic science services?**  
**What are types of Forensic evidence?**  
**What is the difference between individual and class evidence?**  
**What are the steps used to approach a crime scene?**  
**How is a crime scene reconstructed?**  
**Discuss the case of “Lyle and Louise” with students and student theories, such as how the events detailed in the Investigation may have occurred and their possible relation to one another.**

Framework Standard Learning Objectives/ Content Outcomes	Skills	Resources	Instructional Strategies	Assessments
SIS 1 Make observations, raise questions, and formulate hypotheses.	Observe the world around them from a scientific perspective Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.	What is Forensic Science power point Introduction to Forensics Power point Evidence and science power point Physical evidence Power point CSI PowerPoint	<b>Models/simulations</b> <b>Warm up questions</b> <b>Think pair share</b> <b>10-2</b> <b>learning buddies</b> <b>Ticket to leave</b> <b>Acting out a story</b>	Introduction to crime scene investigation The Deadly Picnic: A Lab on deductive Reasoning That’s my story and I’m sticking to it! A Lab on Observing, Remembering, and Recording Events
SIS 2 Design and conduct scientific investigations.	Articulate and explain the major concepts being investigated and the purpose of an investigation. Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge. Identify independent and dependent variables Write procedures that are clear and replicable Employ appropriate methods for accurately and consistently Making observations Making and recording measurements at an appropriate level of precision and Collecting data or evidence in an organized way	Lesson on crime scene evaluation I’m Clueless: A lesson on Deductive Reasoning The Deadly Picnic: A Lab on deductive Reasoning I’ve Got My Eye On You: A Lesson on Observing, Remembering, and Recording Events That’s my story and I’m sticking to it! A Lab on Observing, Remembering, and Recording		

	<p>Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage          Follow safety guidelines</p>	<p>Events          Movie Clip: Brain Games, remember This YouTube clip 15 minutes.          Rubric for case Study          The mystery of Lyle and Louise          (Power point)          The mystery of Lyle and Louise          Background detail worksheet          Kidnapping case Report rubric          Kidnapping case Poster rubric</p>		
<p>SIS 3 Analyze and interpret results of scientific investigations</p>	<p>Present relationships between variables in appropriate forms          Use the results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis          State questions raised by an experiment that may require further investigation</p>			
<p><b>Reading Standards for Literacy in Science</b></p>	<p>1. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.          2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.          7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. proficiently.          10. By the end of grade 12, read and comprehend science/technical texts in the grades 11–CCR text complexity band independently and proficiently</p>	<p>Lesson on crime scene evaluation          I'm Clueless: A lesson on Deductive Reasoning          I've Got My Eye On You: A Lesson on Observing, Remembering, and Recording Events</p>		<p>Case study on "some headache" parts 1-5          Term 1 project a report and Poster on a Kidnapping case          Introduction to crime scene investigation          The Deadly Picnic: A Lab on deductive Reasoning          That's my story and I'm sticking to it! A Lab on Observing, Remembering, and Recording Events</p>
<p><b>Writing Standards for Literacy in Science</b></p>	<p>1. Write arguments focused on <i>discipline-specific content</i>.          a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing</p>			<p>Case study on "some headache" parts 1-5          Term 1 project a report and Poster on a Kidnapping case</p>

	<p>claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience’s knowledge level, concerns, values, and possible biases.</p> <p>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.</p> <p>e. Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience’s knowledge of the topic.</p> <p>c. Use varied transitions and sentence structures to</p>			
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	<p>link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.</p> <p>6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.</p> <p>8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p> <p>10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of</p>			
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	discipline-specific tasks, purposes, and audiences.			
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**Forensic Science**

**Unit: Blood Spatter Analysis**  
 Essential Questions  
**What is blood and explain its components?**  
**How is blood type determined?**  
**What is the velocity and how is it determined?**  
**What is the difference between different velocities of blood spatter?**  
**Evaluate how blood is synthesized and evaluated at a crime scene?**

Framework Standard Learning Objectives/ Content Outcomes	Skills	Resources	Instructional Strategies	Assessments
SIS 1 Make observations, raise questions, and formulate hypotheses.	Observe the world around them from a scientific perspective Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.	Blood analysis power point  The mystery of Lyle and Louise: patterns of Murder: A lab on Blood Spatter	<b>Models/simulations</b> <b>Warm up questions</b> <b>Think pair share</b> <b>10-2</b> <b>learning buddies</b> <b>Ticket to leave</b>	The mystery of Lyle and Louise: patterns of Murder: A lab on Blood Spatter
SIS 2 Design and conduct scientific investigations.	Articulate and explain the major concepts being investigated and the purpose of an investigation. Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge. Identify independent and dependent variables Write procedures that are clear and replicable Employ appropriate methods for accurately and consistently Making observations Making and recording measurements at an appropriate level of precision and Collecting data or evidence in an organized way Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks,	The mystery of Lyle and Louise: patterns of Murder: A lab on Blood Spatter grading rubric  Falling Blood Drops: A lesson on blood-Drop Analysis  What Type are you? A Lesson on Inheritance of Blood types  Blood Typing Lab		Blood Typing Lab

	microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage Follow safety guidelines			
SIS 3 Analyze and interpret results of scientific investigations	Present relationships between variables in appropriate forms Use the results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis State questions raised by an experiment that may require further investigation			
Physics: 1.2 Distinguish between displacement, distance, velocity, speed, and acceleration. Solve problems involving displacement, distance, velocity, speed, and constant acceleration.	Be able to determine change, constancy, and measurements  Determine different velocities of a blood spatter at a crime scene.	Blood spatter lab <u>Case Study 2 “The Fatal Vision Murder”</u> Case Study 2 grading rubric	Models/simulations Warm up questions Think pair share 10-2 learning buddies Ticket to leave	Blood spatter lab Case study “The Fatal vision murders”
<b>Reading Standards for Literacy in Science</b>	2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. 3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. 4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to <i>grades 11–12 texts and topics</i> . 8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of			Case study “The Fatal vision murders” The mystery of Lyle and Louise: patterns of Murder: A lab on Blood Spatter  Blood Typing Lab

	information.			
<b>Writing Standards for Literacy in Science</b>	<p>1. Write arguments focused on <i>discipline-specific content</i>.</p> <p>e. Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>			<p>Case study “The Fatal vision murders”          The mystery of Lyle and Louise: patterns of Murder: A lab on Blood Spatter</p> <p>Blood Typing Lab</p>

**Forensic Science**

**Unit: Forensic Entomology**  
 Essential Questions  
**What is Entomology?**  
**What is the life cycle of a fly?**  
**What are characteristics of fly larva by species and life stage?**  
**Explain the effects of weather on the fly larva life cycle.**  
**What are characteristics of soil?**  
**Explain how to collect evidence of soil?**  
**Compare and contrast different soil samples?**

Framework Standard Learning Objectives/	Skills	Resources	Instructional Strategies	Assessments
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Content Outcomes				
SIS 1 Make observations, raise questions, and formulate hypotheses.	Observe the world around them from a scientific perspective Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.	Trace evidence for soil power point. Soil Lab The Mystery of Lyle and Louise: Nature’s Witness: A lab on Forensic Entomology	<b>Models/simulations</b> <b>Warm up questions</b> <b>Think pair share</b> <b>10-2</b> <b>learning buddies</b> <b>Ticket to leave</b>	Soil Lab Forensic entomology lab (The mystery of Lyle and Louise) Exam 1
SIS 2 Design and conduct scientific investigations.	Articulate and explain the major concepts being investigated and the purpose of an investigation. Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge. Identify independent and dependent variables Write procedures that are clear and replicable Employ appropriate methods for accurately and consistently Making observations Making and recording measurements at an appropriate level of precision and Collecting data or evidence in an organized way Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage Follow safety guidelines	Fly life stages sheet Highland park Climatological Data Morphology of each life stage of two species of fly worksheet Dissecting microspores A lab on Forensic Entomology Grading rubric Time of Death: A Lesson on Forensic Entomology  Movie: Forensic Firsts – Insect Evidence  Exam 1 with answer sheet		
SIS 3 Analyze and interpret results of scientific investigations	Present relationships between variables in appropriate forms Use the results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis State questions raised by an experiment that may require further investigation			

<p>5.2 Describe species as reproductively distinct groups of organisms. Recognize that species are further classified into a hierarchical taxonomic system (kingdom, phylum, class, order, family, genus, species) based on morphological, behavioral, and molecular similarities. Describe the role that geographic isolation can play in speciation.</p>	<p>Be able to identify the life cycle of fly larva.</p>	<p>Fly life stages sheet          Trace evidence for soil power point.          Soil Lab          The mystery of Lyle and Louise case          Forensic entomology lab</p>	<p>Models/simulations          Warm up questions          Think pair share          10-2          learning buddies          Ticket to leave</p>	<p>Soil Lab          Forensic entomology lab          (The mystery of Lyle and Louise)</p>
<p>6.2 Analyze changes in population size and biodiversity (speciation and extinction) that result from the following: natural causes, changes in climate, human activity, and the introduction of invasive, non-native species.</p>	<p>Contrast the growth rates of populations that have undergone demographic transition with those of populations that have not          Explain the behavior of organisms</p>	<p>Fly life stages sheet          Trace evidence for soil power point.          Soil Lab          The mystery of Lyle and Louise case          Forensic entomology lab</p>	<p>Models/simulations          Warm up questions          Think pair share          10-2          learning buddies          Ticket to leave</p>	<p>Soil Lab          Forensic entomology lab          (The mystery of Lyle and Louise)</p>
	<p>Explain the link between weather and species life stages</p>	<p>Fly life stages sheet          Trace evidence for soil power point.          Soil Lab          The mystery of Lyle and Louise case          Forensic entomology lab</p>	<p>Models/simulations          Warm up questions          Think pair share          10-2          learning buddies          Ticket to leave</p>	<p>Soil Lab          Forensic entomology lab          (The mystery of Lyle and Louise)</p>

<p>6.1 Explain how birth, death, immigration, and emigration influence population size.</p>	<p>Be able to explain the interdependence of organisms</p>	<p>Fly life stages sheet          Trace evidence for soil power point.          Soil Lab          The mystery of Lyle and Louise case          Forensic entomology lab</p>	<p>Models/simulations          Warm up questions          Think pair share          10-2          learning buddies          Ticket to leave</p>	<p>Soil Lab          Forensic entomology lab          (The mystery of Lyle and Louise)</p>
<p>6.3 Describe how relationships among organisms (predation, parasitism, competition, commensalisms, and mutualism) add to the complexity of biological communities.</p>	<p>Be able to determine how soil and other organisms effect the growth and development of fly larva</p>	<p>Fly life stages sheet          Trace evidence for soil power point.          Soil Lab          The mystery of Lyle and Louise case          Forensic entomology lab</p>	<p>Models/simulations          Warm up questions          Think pair share          10-2          learning buddies          Ticket to leave</p>	<p>Soil Lab          Forensic entomology lab          (The mystery of Lyle and Louise)</p>
<p><b>Reading Standards for Literacy in Science</b></p>	<p>3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.          8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>			<p>Forensic entomology lab          (The mystery of Lyle and Louise)</p>
<p><b>Writing Standards for Literacy in Science</b></p>	<p>1. Write arguments focused on <i>discipline-specific content</i>.          e. Provide a concluding statement or section that follows from or supports the argument presented.          2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. e. Provide a concluding statement or section that follows from and supports the information or</p>			<p>Forensic entomology lab          (The mystery of Lyle and Louise)</p>

	<p>explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>			
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**Forensic Science**

**Unit: Forensic Foot printing**  
 Essential Questions  
**How are footprints located and recovered?**  
**What are the different types of class and individual characteristics as well as the wear patterns that result from different type of foot types?**

Framework Standard Learning Objectives/ Content Outcomes	Skills	Resources	Instructional Strategies	Assessments
SIS 1 Make observations, raise questions, and formulate hypotheses.	Observe the world around them from a scientific perspective Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.	Foot print evidence power point If the Shoe Fits: A Lesson on Making and Evaluation Shoe Impressions The mystery of Lyle and Louise A Shoe must Fit : A lab on Footprint Analysis Interpret the Data Class Data sheet	Models/simulations Warm up questions Think pair share 10-2 learning buddies Ticket to leave	Footprint Lab (The mystery of Lyle and Louise)
SIS 2 Design and conduct scientific investigations.	Articulate and explain the major concepts being investigated and the purpose of an investigation. Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge. Identify independent and dependent variables Write procedures that are clear and replicable Employ appropriate methods for accurately and consistently Making observations			

	<p>Making and recording measurements at an appropriate level of precision and          Collecting data or evidence in an organized way          Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage          Follow safety guidelines</p>			
SIS 3 Analyze and interpret results of scientific investigations	<p>Present relationships between variables in appropriate forms          Use the results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis          State questions raised by an experiment that may require further investigation</p>			
<b>Reading Standards for Literacy in Science</b>	<p>3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.          8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>			The mystery of Lyle and Louise A Shoe must Fit : A lab on Footprint Analysis
<b>Writing Standards for Literacy in Science</b>	<p>1. Write arguments focused on <i>discipline-specific content</i>.          e. Provide a concluding statement or section that follows from or supports the argument presented.          2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications</p>			The mystery of Lyle and Louise A Shoe must Fit : A lab on Footprint Analysis

	<p>or the significance of the topic).</p> <p>4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>			
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**Forensic Science**

**Unit: Forensic Anthropology and DNA Typing**  
 Essential Questions  
**What is Forensic Anthropology?**  
**What are the fields of Forensic anthropology?**  
**How do you determine if bones are human?**  
**How to determine age, sex, height, and race using bones?**  
**How to estimate time of death using bones?**  
**Explain how DNA used in bone analysis?**  
**What is the structure and function of DNA?**  
**What is DNA Fingerprinting and Gel Electrophoresis?**  
**How is Gel Electrophoresis run?**  
**How is DNA Fingerprinting and Gel Electrophoresis used in a case study?**  
**Explain how DNA is collected at a crime scene.**  
**Explain why DNA amplification is necessary and how PCR amplification works.**  
**Analyze a gel electrophoresis, using instastain, in real time.**

Framework Standard Learning Objectives/ Content Outcomes	Skills	Resources	Instructional Strategies	Assessments
SIS 1 Make observations, raise questions, and formulate hypotheses.	Observe the world around them from a scientific perspective Pose questions and form hypotheses based on personal observations, scientific articles,	Forensic Anthropology Power point Anthropology Lab Forensic Anthropology Review Sheet web quest.	Models/simulations Warm up questions Think pair share 10-2	Anthropology Lab Forensic Anthropology Review Sheet web quest Missing Persons: A lab

	experiments, and knowledge.	Your Bones have a Message: A lesson on Forensic Anthropology Missing Persons: A lab on Forensic Anthropology Making No Bones A bout it! A Lesson on Skeletal Evidence Bone Bonanza: A Lab on Male and female Skeletons Movie: Forensic Firsts – Skeletal Remains	learning buddies Ticket to leave	on Forensic Anthropology Bone Bonanza: A Lab on Male and female Skeletons
SIS 2 Design and conduct scientific investigations.	Articulate and explain the major concepts being investigated and the purpose of an investigation. Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge. Identify independent and dependent variables Write procedures that are clear and replicable Employ appropriate methods for accurately and consistently Making observations Making and recording measurements at an appropriate level of precision and Collecting data or evidence in an organized way Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage Follow safety guidelines	DNA Analysis PowerPoint The Mystery of Lyle and Louise An identity crisis: A Lab on DNA Typing What a Cell can tell: A Lesson on DNA Fingerprinting Missing Parents: A Lab on DNA Fingerprinting and Paternity		The Mystery of Lyle and Louise An identity crisis: A Lab on DNA Typing Missing Parents: A Lab on DNA Fingerprinting and Paternity
SIS 3 Analyze and interpret results of scientific investigations	Present relationships between variables in appropriate forms Use the results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis State questions raised by an experiment that may require further investigation			

<p>3.1 Describe the basic structure (double helix, sugar/phosphate backbone, linked by complementary nucleotide pairs) of DNA, and describe its function in genetic inheritance.</p>	<p>Name several events that led to the discovery of the structure and function of DNA          Describe the structure of a nucleotide          Explain the relationship between nucleotide sequence and DNA structure</p>	<p>DNA Analysis power point          The mystery of Lyle and Louise case            DNA Typing lab “A lab on DNA Analysis” <u>Case study “a mix up at the hospital”</u>          Polymerase chain reaction web quest</p>	<p>Models/simulations          Warm up questions          Think pair share          10-2          learning buddies          Ticket to leave</p>	<p>The Mystery of Lyle and Louise An identity crisis:          A Lab on DNA Typing</p>
<p>3.4 Distinguish among observed inheritance patterns caused by several types of genetic traits (dominant, recessive, incomplete dominance, co-dominant, sex-linked, polygenic, and multiple alleles).</p>	<p>Infer the effect on protein manufacture if a strand of DNA is copied incorrectly          Distinguish between a chromosomal and a gene mutation          Explain how mutations are passed from one generation to another</p>	<p>DNA Analysis power point          The mystery of Lyle and Louise case          DNA Typing lab “A lab on DNA Analysis”  <u>Case study “a mix up at the hospital”</u>          Polymerase chain reaction web quest</p>	<p>Models/simulations          Warm up questions          Think pair share          10-2          learning buddies          Ticket to leave</p>	<p>The Mystery of Lyle and Louise An identity crisis:          A Lab on DNA Typing</p>
<p><b><i>Reading Standards for Literacy in Science</i></b></p>	<p>3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.          5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.          6. Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.          8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>			<p>The Mystery of Lyle and Louise An identity crisis:          A Lab on DNA Typing</p>

<p><i>Writing Standards for Literacy in Science</i></p>	<p>1. Write arguments focused on <i>discipline-specific content</i>.          e. Provide a concluding statement or section that follows from or supports the argument presented.          2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).          4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.          7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.          9. Draw evidence from informational texts to support analysis, reflection, and research.</p>			<p>The Mystery of Lyle and Louise An identity crisis:          A Lab on DNA Typing</p>
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**Forensic Science**

<p><b>Unit: Forensic Fire Debris Analysis</b>          Essential Questions          What is Arson?          What is Oxidation?          What is energy and what are the different forms of energy?          What is the role of heat energy in chemical reactions?          What is heat of combustion and ignition temperature?          Explain the difference between an exothermic and endothermic chemical reaction.          Explain whose role it is to investigate fire          What evidences can be collected?          Describe how physical evidence must be collected at the scene of a suspected arson.          Explain why the oxidation of iron to rust is not accompanied by a flaming fire.</p>
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List the requirements necessary to initiate and sustain combustion.  
 Understand the three mechanisms of heat transfer.  
 Understand how ignitable liquids are identified.

Framework Standard Learning Objectives/ Content Outcomes	Skills	Resources	Instructional Strategies	Assessments
SIS 1 Make observations, raise questions, and formulate hypotheses.	Observe the world around them from a scientific perspective Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.	Forensic Aspects of Fire Investigation PowerPoint The Mystery of Lyle and Louise A Forensic Fire Debris Analysis Lab	Models/simulations Warm up questions Think pair share 10-2 learning buddies Ticket to leave	The Mystery of Lyle and Louise A Forensic Fire Debris Analysis Lab
SIS 2 Design and conduct scientific investigations.	Articulate and explain the major concepts being investigated and the purpose of an investigation. Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge. Identify independent and dependent variables Write procedures that are clear and replicable Employ appropriate methods for accurately and consistently Making observations Making and recording measurements at an appropriate level of precision and Collecting data or evidence in an organized way Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage Follow safety guidelines			
SIS 3 Analyze and interpret results of scientific investigations	Present relationships between variables in appropriate forms Use the results of an experiment to develop a conclusion to an investigation that addresses the			

	initial questions and supports or refutes the stated hypothesis State questions raised by an experiment that may require further investigation			
<p>Physics          3.2 Explain how heat energy will move from a higher temperature to a lower temperature until equilibrium is reached.</p> <p>Physics          3.3 Describe the relationship between average molecular kinetic energy and temperature. Recognize that energy is absorbed when a substance changes from a solid to a liquid to a gas, and that energy is released when a substance changes from a gas to a liquid to a solid. Explain the relationships among evaporation, condensation, cooling, and warming.</p>	<p>Define fire, arson, and oxidation.          Define energy and give examples of its different forms.          Describe the role of heat energy in chemical reactions.          Define heat of combustion and ignition temperature.          Describe the difference between an exothermic and endothermic chemical reaction.          Explain whose role it is to investigate fire          What evidences can be collected?          Describe how physical evidence must be collected at the scene of a suspected arson.          Explain why the oxidation of iron to rust is not accompanied by a flaming fire.          List the requirements necessary to initiate and sustain combustion.          Understand the three mechanisms of heat transfer.          Understand how ignitable liquids are identified.</p>			
<b><i>Reading Standards for Literacy in Science</i></b>	<p>3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p>8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>			The Mystery of Lyle and Louise A Forensic Fire Debris Analysis Lab

<p><i>Writing Standards for Literacy in Science</i></p>	<p>1. Write arguments focused on <i>discipline-specific content</i>.          e. Provide a concluding statement or section that follows from or supports the argument presented.          2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).          4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.          7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.          9. Draw evidence from informational texts to support analysis, reflection, and research.</p>			<p>The Mystery of Lyle and Louise A Forensic Fire Debris Analysis Lab</p>
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**Forensic Science**

<p><b>Unit: Analyzing Documents</b>          Essential Questions          What is Forgery?          What types of documents can be forged?          How are forgeries discovered?          Who confirms forgeries and what are the punishments for forgeries?          What are the 12 handwriting characteristics?          How are handwriting samples taken?          What is paper chromatograph?          How and why are chromatography done?          What are questioned documents?</p>
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Framework Standard Learning Objectives/ Content Outcomes	Skills	Resources	Instructional Strategies	Assessments
SIS 1 Make observations, raise questions, and formulate hypotheses.	Observe the world around them from a scientific perspective Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.	Document and Handwriting analysis PowerPoint  Forensic science Questions documents PowerPoint	Models/simulations Warm up questions Think pair share 10-2 learning buddies Ticket to leave	Write On! A Lab on Document Forgery
SIS 2 Design and conduct scientific investigations.	Articulate and explain the major concepts being investigated and the purpose of an investigation. Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge. Identify independent and dependent variables Write procedures that are clear and replicable Employ appropriate methods for accurately and consistently Making observations Making and recording measurements at an appropriate level of precision and Collecting data or evidence in an organized way Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage Follow safety guidelines	The Mystery of Lyle and Louise: An Inky Lead A Lab on Questioned Documents Who Wrote This? A Lesson on Document Forgery Write On! A Lab on Document Forgery Typewriter Personality: A lesson on Typewriter Comparison Tattle – Tale Type: A Lab on typewriter Comparison		The Mystery of Lyle and Louise: An Inky Lead A Lab on Questioned Documents  Tattle – Tale Type: A Lab on typewriter Comparison
SIS 3 Analyze and interpret results of scientific investigations	Present relationships between variables in appropriate forms Use the results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis State questions raised by an experiment that may require further investigation			

	Chromatography			
<b>Reading Standards for Literacy in Science</b>	<p>3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p>8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>			The Mystery of Lyle and Louise: An Inky Lead A Lab on Questioned Documents
<b>Writing Standards for Literacy in Science</b>	<p>1. Write arguments focused on <i>discipline-specific content</i>.</p> <p>e. Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>			The Mystery of Lyle and Louise: An Inky Lead A Lab on Questioned Documents

**Forensic Science**

**Unit: Fingerprinting**  
 Essential Questions

Explain the fundamental principles of fingerprinting.  
 What are the three classes of fingerprints?  
 What methods are available for detecting fingerprints?  
 How are finger prints taken and processed?

Framework Standard Learning Objectives/ Content Outcomes	Skills	Resources	Instructional Strategies	Assessments
SIS 1 Make observations, raise questions, and formulate hypotheses.	Observe the world around them from a scientific perspective Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.	Fingerprint PowerPoint  The Mystery of Lyle and Louise: Read the Found Prints: A Lab on Finger printing Analysis	<b>Models/simulations</b> <b>Warm up questions</b> <b>Think pair share</b> <b>10-2</b> <b>learning buddies</b> <b>Ticket to leave</b>	The Mystery of Lyle and Louise: Read the Found Prints: A Lab on Finger printing Analysis  Finger print Lab 2 Finger print web quest
SIS 2 Design and conduct scientific investigations.	Articulate and explain the major concepts being investigated and the purpose of an investigation. Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge. Identify independent and dependent variables Write procedures that are clear and replicable Employ appropriate methods for accurately and consistently Making observations Making and recording measurements at an appropriate level of precision and Collecting data or evidence in an organized way Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage Follow safety guidelines	Finger Print Web quest Finger Print Lab 2 Finger print practice exercise Fingerprint Identification worksheet Minnie mouse finger print case Movie: Forensic Firsts - Fingerprints		
SIS 3 Analyze and interpret results of scientific investigations	Present relationships between variables in appropriate forms Use the results of an experiment to develop a conclusion to an investigation that addresses the			

	<p>initial questions and supports or refutes the stated hypothesis          State questions raised by an experiment that may require further investigation          Identify finger print patterns</p>			
<p><b><i>Reading Standards for Literacy in Science</i></b></p>	<p>3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.          8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>			<p>The Mystery of Lyle and Louise: Read the Found Prints: A Lab on Finger printing Analysis</p>
<p><b><i>Writing Standards for Literacy in Science</i></b></p>	<p>1. Write arguments focused on <i>discipline-specific content</i>.          e. Provide a concluding statement or section that follows from or supports the argument presented.          2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).          4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.          7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>			<p>The Mystery of Lyle and Louise: Read the Found Prints: A Lab on Finger printing Analysis</p>

**Unit: Forensic Odontology (Bite Mark Analysis)**

Essential Questions

What is Forensic odontology?

What is a bite mark?

Why are bite marks useful in solving crimes?

How are bite marks analyzed?

How are bite mark samples and evidence collected?

What are some consideration and limitations of bite marks?

What characteristics of teeth are helpful in analyzing bite marks?

Framework Standard Learning Objectives/ Content Outcomes	Skills	Resources	Instructional Strategies	Assessments
SIS 1 Make observations, raise questions, and formulate hypotheses.	Observe the world around them from a scientific perspective Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.	Analysis of Bite marks power point  Impressive evidence PowerPoint  Bite mark identification activity  The Mystery of Lyle and Louise: Bad Impression: A Lab on Bite marks Analysis	<b>Models/simulations</b> <b>Warm up questions</b> <b>Think pair share</b> <b>10-2</b> <b>learning buddies</b> <b>Ticket to leave</b>	The Mystery of Lyle and Louise: Bad Impression: A Lab on Bite marks Analysis  Bite mark identification activity  Take a Bite out of Crime: A lab on Dental Forensics Bite Marks Analysis Lab
SIS 2 Design and conduct scientific investigations.	Articulate and explain the major concepts being investigated and the purpose of an investigation. Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge. Identify independent and dependent variables Write procedures that are clear and replicable Employ appropriate methods for accurately and consistently Making observations Making and recording measurements at an appropriate level of precision and Collecting data or evidence in an organized way	The Teeth Will Tell A Lesson on Dental Forensics  Take a Bite out of Crime: A lab on Dental Forensics Bite Marks Analysis Lab  The Thief who wore lipstick: A lesson on Lip Print patterns  Red Lips A Lab on Lip Print Patterns		Red Lips A Lab on Lip Print Patterns

	<p>Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage          Follow safety guidelines</p>			
<p>SIS 3 Analyze and interpret results of scientific investigations</p>	<p>Present relationships between variables in appropriate forms          Use the results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis          State questions raised by an experiment that may require further investigation</p>			
<p><i>Reading Standards for Literacy in Science</i></p>	<p>3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.          8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>			<p>The Mystery of Lyle and Louise: Bad Impression: A Lab on Bite marks Analysis</p>

<p><b>Writing Standards for Literacy in Science</b></p>	<p>1. Write arguments focused on <i>discipline-specific content</i>.          e. Provide a concluding statement or section that follows from or supports the argument presented.          2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).          4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.          7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>			<p>The Mystery of Lyle and Louise: Bad Impression:          A Lab on Bite marks          Analysis</p>
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**Forensic Science**

<p><b>Unit: Glass Fragment Identification</b>          Essential Questions          What is glass?          How do Forensic scientists analyze glass evidence?          How does glass break?          What characteristics of glass are analyzed at crime scenes?</p>
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<b>Framework Standard          Learning Objectives/          Content Outcomes</b>	<b>Skills</b>	<b>Resources</b>	<b>Instructional Strategies</b>	<b>Assessments</b>
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<p>SIS 1 Make observations, raise questions, and formulate hypotheses.</p>	<p>Observe the world around them from a scientific perspective          Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.</p>	<p>Shattered: Forensic Glass Analysis PowerPoint           The mystery of Lyle and Louise          The jagged edge: A Glass Fragment Identification Lab           Forces that Fracture Glass: A Lesson on Examination of Glass Fractures</p>	<p>Models/simulations          Warm up questions          Think pair share          10-2          learning buddies          Ticket to leave</p>	<p>The mystery of Lyle and Louise          The jagged edge:          A Glass Fragment Identification Lab</p>
<p>SIS 2 Design and conduct scientific investigations.</p>	<p>Articulate and explain the major concepts being investigated and the purpose of an investigation.          Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.          Identify independent and dependent variables          Write procedures that are clear and replicable          Employ appropriate methods for accurately and consistently          Making observations          Making and recording measurements at an appropriate level of precision and          Collecting data or evidence in an organized way          Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage          Follow safety guidelines</p>	<p>Glass Chip Tips: A lesson on Glass identification           Glass Can tell on You. A Lab on Glass identification</p>		

<p>SIS 3 Analyze and interpret results of scientific investigations</p>	<p>Present relationships between variables in appropriate forms          Use the results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis          State questions raised by an experiment that may require further investigation</p>			
<p><b>Reading Standards for Literacy in Science</b></p>	<p>3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.          8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>			<p>The mystery of Lyle and Louise The jagged edge:          A Glass Fragment          Identification Lab</p>
<p><b>Writing Standards for Literacy in Science</b></p>	<p>1. Write arguments focused on <i>discipline-specific content</i>.          e. Provide a concluding statement or section that follows from or supports the argument presented.          2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).          4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.          7. Conduct short as well as more sustained research projects to answer a question (including a self-generated</p>			<p>The mystery of Lyle and Louise The jagged edge:          A Glass Fragment          Identification Lab</p>

	question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.			
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**Forensic Science**

**Unit: Hair and Fiber Analysis**  
 Essential Questions  
 Explain the anatomy of a hair.  
 How are hair and fiber used as evidence at a crime scene?  
 What evidence can be found at the root of a hair?  
 What is the primary purpose of examining hair and fibers in a criminal case?  
 How is hair and fiber evidence collected?  
 Compare and contrast different hair and fiber samples.

<b>Framework Standard Learning Objectives/ Content Outcomes</b>	<b>Skills</b>	<b>Resources</b>	<b>Instructional Strategies</b>	<b>Assessments</b>
SIS 1 Make observations, raise questions, and formulate hypotheses.	Observe the world around them from a scientific perspective Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.	Trace Evidence: Hair and Fibers power point  Hair and Fiber analysis web quest  Hair Analysis activity  Sarah Payne Case Study with Rubric	Models/simulations Warm up questions Think pair share 10-2 learning buddies Ticket to leave	Hair and Fiber Analysis Lab  Hair Analysis activity  Sarah Payne Case Study  Hair and Fiber Lab The mystery of Lyle and Louise: Strands of

<p>SIS 2 Design and conduct scientific investigations.</p>	<p>Articulate and explain the major concepts being investigated and the purpose of an investigation.          Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.          Identify independent and dependent variables          Write procedures that are clear and replicable          Employ appropriate methods for accurately and consistently          Making observations          Making and recording measurements at an appropriate level of precision and          Collecting data or evidence in an organized way          Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage          Follow safety guidelines</p>	<p>Hair and Fiber Lab</p> <p>The mystery of Lyle and Louise:          Strands of evidence: A lab on Hair and Fiber Analysis</p> <p>Fibers Don't Fib! A lesson on Fiber Analysis</p>		<p>evidence: A lab on Hair and Fiber Analysis</p>
<p>SIS 3 Analyze and interpret results of scientific investigations</p>	<p>Present relationships between variables in appropriate forms          Use the results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis          State questions raised by an experiment that may require further investigation</p>			

<p><b>Reading Standards for Literacy in Science</b></p>	<p>2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p>3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p>8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p> <p>10. By the end of grade 12, read and comprehend science/technical texts in the grades 11–CCR text complexity band independently and proficiently</p>			<p>The mystery of Lyle and Louise: Strands of evidence: A lab on Hair and Fiber Analysis        Sarah Payne Case Study</p>
<p><b>Writing Standards for Literacy in Science</b></p>	<p>1. Write arguments focused on <i>discipline-specific content</i>.</p> <p>a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</p> <p>b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience’s knowledge level, concerns, values, and possible biases.</p> <p>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p>			<p>The mystery of Lyle and Louise: Strands of evidence: A lab on Hair and Fiber Analysis        Sarah Payne Case Study</p>

	<p>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.</p> <p>e. Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>4. Produce clear and coherent writing in which the development, organization, and style are</p>			
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	<p>appropriate to task, purpose, and audience.</p> <p>5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.</p> <p>6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.</p> <p>7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p> <p>8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p> <p>9. Draw evidence from informational texts to support analysis, reflection, and research.</p> <p>10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.</p>			
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Forensic Science

**Unit: Blood Detection and Evidence Analysis**  
 Essential Questions  
**What is blood?**  
**What are the components of blood?**  
**How is blood typed?**  
**Describe several presumptive tests for blood detection.**  
**How is a case processed using blood?**  
**What actions should be avoided when collecting blood evidence?**  
**How is the evidence protected and handled while collection is taking place?**  
**Explain the chain of custody for the evidence.**

Framework Standard Learning Objectives/ Content Outcomes	Skills	Resources	Instructional Strategies	Assessments
SIS 1 Make observations, raise questions, and formulate hypotheses.	Observe the world around them from a scientific perspective Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.	Forensic DNA Analysis PowerPoint  The Mystery of Lyle and Louise: Stained with suspicion A Lab on Blood Detection and Evidence Processing	<b>Models/simulations</b> <b>Warm up questions</b> <b>Think pair share</b> <b>10-2</b> <b>learning buddies</b> <b>Ticket to leave</b>	The Mystery of Lyle and Louise: Stained with suspicion A Lab on Blood Detection and Evidence Processing
SIS 2 Design and conduct scientific investigations.	Articulate and explain the major concepts being investigated and the purpose of an investigation. Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge. Identify independent and dependent variables Write procedures that are clear and replicable Employ appropriate methods for accurately and consistently Making observations Making and recording measurements at an appropriate level of precision and			

	<p>Collecting data or evidence in an organized way          Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage          Follow safety guidelines</p>			
<p>SIS 3 Analyze and interpret results of scientific investigations</p>	<p>Present relationships between variables in appropriate forms          Use the results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis          State questions raised by an experiment that may require further investigation</p>			
<p><i>Reading Standards for Literacy in Science</i></p>	<p>3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.          8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>			<p>The Mystery of Lyle and Louise: Stained with suspicion A Lab on Blood Detection and Evidence Processing</p>

<p><i>Writing Standards for Literacy in Science</i></p>	<p>1. Write arguments focused on <i>discipline-specific content</i>.          e. Provide a concluding statement or section that follows from or supports the argument presented.          2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).          4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.          7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>			<p>The Mystery of Lyle and Louise: Stained with suspicion A Lab on Blood Detection and Evidence Processing</p>
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**Forensic Science**

**Unit: Gunshot Analysis**  
 Essential Questions  
 Explain which characteristics can aid in detecting a specific Firearms?  
 What are the components of a bullet cartridge?  
 Compare and contrast different types of bullets  
 What is a caliber?  
 Compare and contrast rifle and bullet marks .  
 How can gunshot residue be used to determine firing distance?  
 What tests are used to determine the existence of Gunshot residue?

Framework Standard Learning Objectives/ Content Outcomes	Skills	Resources	Instructional Strategies	Assessments
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<p>SIS 1 Make observations, raise questions, and formulate hypotheses.</p>	<p>Observe the world around them from a scientific perspective          Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.</p>	<p>Firearms, Tool Marks, and Other Impressions PowerPoint           The Mystery of Lyle and Louise: A Smoking Gun. A lab on Gun Shot Residue.           The Mystery of Lyle and Louise: Shot in the dark: A Lab on Bullet Striations</p>	<p>Models/simulations          Warm up questions          Think pair share          10-2          learning buddies          Ticket to leave</p>	<p>The Mystery of Lyle and Louise: A Smoking Gun. A lab on Gun Shot Residue.           The Mystery of Lyle and Louise: Shot in the dark: A Lab on Bullet Striations</p>
<p>SIS 2 Design and conduct scientific investigations.</p>	<p>Articulate and explain the major concepts being investigated and the purpose of an investigation.          Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.          Identify independent and dependent variables          Write procedures that are clear and replicable          Employ appropriate methods for accurately and consistently          Making observations          Making and recording measurements at an appropriate level of precision and          Collecting data or evidence in an organized way          Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage          Follow safety guidelines</p>	<p>Movie: Forensic Firsts – Smoking Gun</p>		

<p>SIS 3 Analyze and interpret results of scientific investigations</p>	<p>Present relationships between variables in appropriate forms        Use the results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis        State questions raised by an experiment that may require further investigation</p>			
<p><b>Reading Standards for Literacy in Science</b></p>	<p>3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.        8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>			<p>The Mystery of Lyle and Louise: A Smoking Gun. A lab on Gun Shot Residue.         The Mystery of Lyle and Louise: Shot in the dark: A Lab on Bullet Striations</p>
<p><b>Writing Standards for Literacy in Science</b></p>	<p>1. Write arguments focused on <i>discipline-specific content</i>.        e. Provide a concluding statement or section that follows from or supports the argument presented.        2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).        4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.        7. Conduct short as well as more sustained research projects to answer a question (including a self-generated</p>			<p>The Mystery of Lyle and Louise: A Smoking Gun. A lab on Gun Shot Residue.         The Mystery of Lyle and Louise: Shot in the dark: A Lab on Bullet Striations</p>

	question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.			
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**Forensic Science**

**Unit: Drug Analysis**  
 Essential Questions  
 What is Toxicology?  
 Explain the role and responsibilities of a forensic toxicologist.  
 What are some effects of toxins to the body?  
 Explain where the best places to test for toxins are located in the body.  
 List and explain some common testing procedures for toxins.  
 Describe several familiar toxins and their effects.  
 Compare and contrast depressants and stimulants.

<b>Framework Standard Learning Objectives/ Content Outcomes</b>	<b>Skills</b>	<b>Resources</b>	<b>Instructional Strategies</b>	<b>Assessments</b>
SIS 1 Make observations, raise questions, and formulate hypotheses.	Observe the world around them from a scientific perspective Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.	Toxicology drugs and poisons PowerPoint  List of familiar poisons student handout  White substance analysis and identification lab  The mystery of Lyle and Louise:	Models/simulations Warm up questions Think pair share 10-2 learning buddies Ticket to leave	Drug Testing and analysis lab  White substance analysis and identification lab

<p>SIS 2 Design and conduct scientific investigations.</p>	<p>Articulate and explain the major concepts being investigated and the purpose of an investigation.          Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.          Identify independent and dependent variables          Write procedures that are clear and replicable          Employ appropriate methods for accurately and consistently          Making observations          Making and recording measurements at an appropriate level of precision and          Collecting data or evidence in an organized way          Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage          Follow safety guidelines</p>	<p>A Prescription for Crim. A lab on Drug Testing and Analysis.</p> <p>Video Clip for Lyle and Louse case</p> <p>Movie: Forensic Firsts – Proving Poison</p>		
<p>SIS 3 Analyze and interpret results of scientific investigations</p>	<p>Present relationships between variables in appropriate forms          Use the results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis          State questions raised by an experiment that may require further investigation</p>			

<p><b>Reading Standards for Literacy in Science</b></p>	<p>3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p>8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>			<p>Drug Testing and analysis lab</p> <p>White substance analysis and identification lab</p>
<p><b>Writing Standards for Literacy in Science</b></p>	<p>1. Write arguments focused on <i>discipline-specific content</i>.</p> <p>e. Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>			<p>Drug Testing and analysis lab</p> <p>White substance analysis and identification lab</p>

**Forensic Science**

**Unit: Mock Trial**  
 Essential Questions

**What are the procedures for trial of criminal cases and the simplified rules of evidence?**

**Explain how the US court system functions.  
 Explain the roles of each of the participants during the trial.**

Framework Standard Learning Objectives/ Content Outcomes	Skills	Resources	Instructional Strategies	Assessments
SIS 1 Make observations, raise questions, and formulate hypotheses.	Observe the world around them from a scientific perspective Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.	The mystery of Lyle and Louise Mock Trial	Models/simulations Warm up questions Think pair share 10-2 learning buddies Ticket to leave	The Mystery of Lyle and Louise Mock Trial
SIS 2 Design and conduct scientific investigations.	Articulate and explain the major concepts being investigated and the purpose of an investigation. Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge. Identify independent and dependent variables Write procedures that are clear and replicable Employ appropriate methods for accurately and consistently Making observations Making and recording measurements at an appropriate level of precision and Collecting data or evidence in an organized way Properly use instruments, equipment, and materials (such as scales, probe ware, meter sticks, microscopes, computers, etc.) including: set-up, calibration (if required), technique, maintenance, and storage Follow safety guidelines			

<p>SIS 3 Analyze and interpret results of scientific investigations</p>	<p>Present relationships between variables in appropriate forms          Use the results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis          State questions raised by an experiment that may require further investigation</p>			
<p><b>Reading Standards for Literacy in Science</b></p>	<p>5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.          8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.          9. Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p>			<p>The Mystery of Lyle and Louise Mock Trial</p>
<p><b>Writing Standards for Literacy in Science</b></p>	<p>1. Write arguments focused on <i>discipline-specific content</i>.          a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.          b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience’s knowledge level, concerns, values, and possible biases.</p>			<p>The Mystery of Lyle and Louise Mock Trial</p>

	<p>c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.</p> <p>e. Provide a concluding statement or section that follows from or supports the argument presented.</p> <p>2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p>a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</p> <p>d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</p> <p>e. Provide a concluding statement or section that follows from and supports the information or</p>			
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	<p>explanation provided (e.g., articulating implications or the significance of the topic).</p> <p>4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.</p> <p>6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.</p> <p>8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p> <p>10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.</p>			
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