

# **STRATFORD PUBLIC SCHOOLS**

## **Stratford, Connecticut**



*“Tantum eruditi sunt liberi”*  
Only the Educated Are Free

## **Forensic Science**

### **Grades 11 - 12**

Revised and Edited by  
**Carrie Tait**

Reviewed by  
**Secondary Science Department Heads**  
**Peter Bowe and Donald Mascola**

Adopted by the Board of Education on June 27, 2011

**Irene Cornish**  
**Superintendent of Schools**

**Elaine Watson**  
**Assistant Superintendent**

## **DISTRICT MISSION**

The mission of the Stratford Public Schools is to develop a community of learners in which students acquire the knowledge, skills and confidence to meet the challenges of a changing and increasingly diverse 21st century society.

## **DISTRICT CORE VALUES**

Students will acquire content knowledge, strengthen higher-order thinking, and develop character in order to address 21st century challenges.

## **BUNNELL HIGH SCHOOL BELIEFS**

We believe teachers must work collaboratively in support of student learning and to model collaboration as a social skill with students. We believe that a rigorous curriculum for all students, an acceptance of diversity, and a culture that actively welcomes all learners will contribute to a more knowledgeable community and society. We believe in the value of a strong education as a means of preparing students for work and life in the remainder of the 21st century.

## **STRATFORD HIGH SCHOOL BELIEFS**

- a safe, positive school climate that embraces diversity is essential to ensure respect and opportunity for each individual
- students should understand the world beyond their community in order to contribute to a global society
- parents and students must share responsibility and work in partnership with the school in order to improve academic performance and to develop lifelong learners
- students should use technology effectively to acquire, process, and deliver information

## **BUNNELL HIGH SCHOOL and STRATFORD HIGH SCHOOL**

### **LEARNING EXPECTATIONS**

All students will...

- use real-world digital and other research tools to access, evaluate and effectively apply information appropriate for authentic tasks. (Academic)

- work independently and collaboratively to solve problems and accomplish goals. (Civic-Social)
- communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes. (Academic)
- demonstrate innovation, flexibility and adaptability in thinking patterns, work habits and working/learning conditions. (Academic)
- effectively apply the analysis, synthesis and evaluation processes that enable productive problem solving. (Academic)
- value and demonstrate personal responsibility, character, cultural understanding and ethical behavior. (Civic-Social)
- show competence in all core academic subjects and other fields of interest, including the ability to clearly and effectively communicate content information in multiple formats. (Academic)

### **Stratford Information Literacy and Technology Standards**

#### **Standard 1: Information Strategies**

Students determine their need for information and apply strategies to select, locate, and access information resources.

*Essential Understanding:*

Intelligent decision-making is based on recognizing the need and applying appropriate strategies for accessing information.

#### **Standard 2: Information Use**

Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests.

*Essential Understanding:*

All information is not equal.

#### **Standard 3: Information and Technology Application**

Students use appropriate technologies to create written, visual, oral and multimedia products that communicate ideas and information.

*Essential Understanding:*

The effective communication of ideas and information is influenced by the use of appropriate formats.

#### **Standard 4: Literacy and Literary Appreciation**

Students extract meaning from fiction and non-fiction resources in a variety of formats. They demonstrate an enjoyment of reading, including an appreciation of literature and other creative expressions.

*Essential Understanding:*

Reading provides a variety of benefits and advantages.

#### **Standard 5: Personal Management**

Students display evidence of ethical, legal, and social responsibility in regard to information resources and project and self-management.

*Essential Understanding:*

## Successful learning requires self-evaluation and discipline

### 21<sup>st</sup> Century Skills

1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks.
2. Work independently and collaboratively to solve problems and accomplish goals.
3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.
4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions.
5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving.
6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.

## **Stratford Public Schools** **Standards for Science**

“What an exiting senior should be able to do in science.”

### **Inquiry**

1. Demonstrate an understanding and apply basic scientific concepts, principles and theories in biology, chemistry, physics and earth/space sciences relative to the science program completed by the student.
2. Identify and solve problems through scientific investigation, including: identification of the problem, student design of experiments, collection of relevant evidence or data, use of logical reasoning, appropriately analyzing quantitative and qualitative data from experiments, drawing conclusions and identifying the validity of an experiment.
3. Demonstrate various scientific inquiry skills including: formulating predictions, differentiating between observations and inferences, making generalizations from observations, relating an effect to its cause, identifying patterns or relationships, distinguishing between quantitative and qualitative observations, comparing, sorting and/or classifying objects or events.
4. Select and use appropriate technology, laboratory equipment and materials, including sensing devices to measure, calculate, organize and communicate data.
5. Demonstrate the ability to work independently and collaboratively in an organized fashion to complete a task.

### **Communication**

6. Demonstrate the abilities associated with accurate and effective communication. These include writing, following written procedures, summarizing data, using language appropriately, developing diagrams and charts, explaining statistical analysis, constructing a reasoned argument, and responding to critical comments.
7. Demonstrate the ability to create and/or interpret scientific information provided in graphs, tables, charts and illustrations.

### **STS – Science, Technology & Society**

8. Distinguish between the role of science striving to understand the natural world and technology seeking solutions to human problems.
9. Analyze the possibilities and limits of science and technology in order to make and defend decisions about societal issues.

### **Safety In The Science Laboratory**

Students and teachers must be aware of the potential for safety problems in the science classrooms and laboratories. Schools should review available safety resources and develop safety training for their teachers and students as well as safety rules for the classroom.

Teachers must choose safe labs that cover important concepts. Thought must be given to the chemicals purchased by schools. Which chemicals are the safest for the proposed labs, how much is needed, where will the chemicals be stored and in what arrangement? Are the storage areas locked and well ventilated?

### **General Lab Safety Recommendations**

1. Always perform an experiment or demonstration prior to allowing students to replicate the activity. Look for possible hazards. Alert students to potential dangers.
2. Safety instructions should be given orally and be posted each time an experiment is begun.
3. Constant surveillance and supervision of student activities are essential.
4. Never eat or drink in the laboratory or from laboratory equipment. Keep personal items off the lab tables.
5. Never use mouth suction in filling pipettes with chemical reagents. Use a suction bulb.

### **General Science Safety Checklist**

The following is a suggested checklist of safety concerns in K-12 science laboratories.

1. Appropriate protective equipment for the science laboratory
2. Enforcement of safety procedures
3. All students and teachers know the location of all protective equipment
4. All students read and sign a lab safety contract.

5. Sufficient, accessible lab stations per number of students in each laboratory
6. All students must wear proper safety goggles whenever chemicals, glassware, or heat are used

No food products should be consumed by staff or students  
as part of a lesson, unit or related course work.

**Stratford Public Schools**  
**Unit Plan for High School Science**  
**Forensic Science Unit # 1**

<b>Unit Name:</b> History of Forensics Fields and Careers in Forensics		<b>Est. # of Weeks:</b> 3 weeks
<b>Synopsis:</b> Students will investigate how the field of Forensic Science started and investigate historical figures in the forensic field. Students will list and describe the many fields and careers in forensics.		
<b>STUDENT LEARNING GOALS</b>		
<b>Content-Specific Powered Standards</b> Forensic Science is an interdisciplinary Subject incorporating various content standards from Biology , Chemistry, Physics, Math , and Psychology, and Art	<b>Interdisciplinary Standards (Technology Integration)</b> <b>Standard 1: Information Strategies</b> Students determine their need for information and apply strategies to select, locate, and access information resources. <b>Standard 2: Information Use</b> Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests. <b>Standard 3: Information and Technology Application</b> Students use appropriate technologies to create written, visual, oral and multimedia products that communicate ideas and information.. <b>Standard 5: Personal Management</b> Students display evidence of ethical, legal, and social responsibility in regard to information resources and project and self-management.	
<b>21<sup>st</sup> Century Skills</b> <b>1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks.</b> <b>2. Work independently and collaboratively to solve problems and accomplish goals.</b> <b>3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.</b> <b>4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions.</b> <b>5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving.</b> <b>6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.</b>	<hr style="border-top: 1px dashed black;"/> <b>Key Vocabulary:</b> Forensic Science Expert witness Locard's Exchange Principle Forensics Specialists Worksheet	

<p><b><u>Enduring Understandings</u></b></p> <ul style="list-style-type: none"> <li>• Students will understand the meaning of Forensic science.</li> <li>• Students will understand there are many different careers/ fields in Forensic science, but the most important field is particular to each case.</li> </ul>	<p><b><u>Essential Questions</u></b></p> <ul style="list-style-type: none"> <li>• What is Forensic Science?</li> <li>• What traits or characteristics are needed in the field of forensics?</li> <li>• Which career/field in Forensic Science is the most important in solving crimes?</li> </ul>
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<p><b>Learning Objectives / Grade Level Expectations</b>  <i>Students will be able to:</i></p> <ul style="list-style-type: none"> <li>• <i>Define forensic science and list the major disciplines it encompasses.</i></li> <li>• <i>Recognize the major contributors to the development of forensic science.</i></li> <li>• <i>Describe the services of a typical crime laboratory.</i></li> <li>• <i>Explain the role and responsibilities of an expert witness.</i></li> <li>• <i>List and describe the specialized forensic services and fields that are involved in the field of forensic science.</i></li> </ul>
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**ASSESSMENT PLAN**

<p><b>Summative Assessment(s)/Performance Based Assessments including 21<sup>st</sup> Century Learning</b></p> <ul style="list-style-type: none"> <li>• History of Forensics: mini project using glogster, photostory , voicethread to present facts about a historical figure and how they were important to the field of Forensics.</li> <li>• Research project: Students will research a specific field of forensics and a high profile case. They will determine what the best field in forensics is to solve the crime in the case. Presentation to the class using glogster, voicethread, photostory or any other multimedia form of presentation. ( This will continue throughout the semester)</li> </ul>	<p><b>Formative and Diagnostic Assessment(s)</b></p> <ul style="list-style-type: none"> <li>• Quiz on history of forensics</li> <li>• Lab: “I’m Clueless” on Deductive Reasoning</li> <li>• Jasclevich Case Study</li> <li>• OJ Simpson Case Study</li> <li>• Forensics Specialists Vocab</li> </ul>
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**LEARNING PLAN COMPONENTS**

<ul style="list-style-type: none"> <li>-Classwork</li> <li>-Homework</li> <li>-Labs</li> <li>-Notes</li> <li>-Video Clips</li> <li>-Class observations</li> <li>-Class discussions</li> <li>-Quizzes</li> </ul>
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**Stratford Public Schools**  
**Unit Plan for High School Science**  
**Forensic Science Unit # 2**

<b>Unit Name:</b> The Crime Scene		<b>Est. # of Weeks:</b> 2 weeks	
<b>Synopsis:</b> Students will understand how to Secure and Record the Crime Scene. They will understand how all crime scenes run on physical evidence and it is vital to follow the correct steps in order to preserve the evidence			
<b>STUDENT LEARNING GOALS</b>			
<b>Content-Specific Powered Standards</b> State and Federal laws protect individuals when crime scene evidence is collected.		<b>Interdisciplinary Standards (Technology Integration)</b>	
		<b>Standard 1: Information Strategies</b> Students determine their need for information and apply strategies to select, locate, and access information resources.	
		<b>Standard 2: Information Use</b> Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests.	
		<b>Standard 5: Personal Management</b> Students display evidence of ethical, legal, and social responsibility in regard to information resources and project and self-management.	
<b>21<sup>st</sup> Century Skills</b> 1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks. 2. Work independently and collaboratively to solve problems and accomplish goals. 3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes. 4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions. 5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving. 6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.		----- <b>Key Vocabulary:</b> Physical evidence Chain of custody Livor mortis Rigor mortis Algor mortis	

<p><b><u>Enduring Understandings:</u></b></p> <ul style="list-style-type: none"> <li>• Students will understand how securing and recording the crime scene is essential to the collection and preservation of physical evidence.</li> </ul>	<p><b><u>Essential Questions:</u></b></p> <ul style="list-style-type: none"> <li>• What are the steps necessary to secure and record the crime scene?</li> <li>• What is physical evidence?</li> <li>• How does a blowfly and its faunal succession determine the time of death?</li> </ul>
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<p><b>Learning Objectives / Grade Level Expectations</b>  <i>Students will:</i></p> <ul style="list-style-type: none"> <li>• Define physical evidence and specific examples of physical evidence.</li> <li>• Determine the difference between individual vs. class evidence.</li> <li>• Discuss the responsibilities of the first police responder who arrives at the crime scene.</li> <li>• Explain the steps needed to thoroughly record the crime scene.</li> <li>• Describe the proper procedures for conducting a systematic search of a crime scene for physical evidence.</li> <li>• Define and understand the concept of chain of custody</li> <li>• Describe the proper techniques for packaging common types of evidence. <ul style="list-style-type: none"> <li>• Determine the lifecycle of a blowfly and how it can determine the time of death</li> </ul> </li> </ul>
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**ASSESSMENT PLAN**

<p><b>Summative Assessment(s)/Performance Based Assessments including 21<sup>st</sup> Century Learning</b></p> <ul style="list-style-type: none"> <li>• Crime Scene Analysis Activity</li> <li>• Chapter 2/3 Test</li> <li>• Zodiac Killer study</li> <li>• Entomology Webquest</li> </ul>	<p><b>Formative and Diagnostic Assessment(s)</b></p> <ul style="list-style-type: none"> <li>• Searching For Evidence Lab</li> <li>• Enrique Camarena Case Study Discussion</li> <li>• Serial Killer Profiling Method</li> </ul>
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**LEARNING PLAN COMPONENTS**

<ul style="list-style-type: none"> <li>-Classwork</li> <li>-Homework</li> <li>-Labs</li> <li>-Notes</li> <li>-Video Clips</li> <li>-Class observations</li> <li>-Class discussions</li> <li>-Quizzes</li> </ul>
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**Stratford Public Schools**  
**Unit Plan for High School Science**  
**Forensic Science Unit # 3**

<b>Unit Name:</b> Analysis of Trace Evidence		<b>Est. # of Weeks:</b> 7 weeks																												
<b>Synopsis:</b> Once the evidence has been collected at the crime scene, students will determine how to analyze the evidence in a laboratory setting.																														
<b>STUDENT LEARNING GOALS</b>																														
<b>Content-Specific Powered Standards</b> The chain of possession by crime scene workers is critical as to the validity of evidence submitted in a court of law. Standard lab practices and scientific method are critical components of Forensic Science.		<b>Interdisciplinary Standards (Technology Integration)</b> <b>Standard 1: Information Strategies</b> Students determine their need for information and apply strategies to select, locate, and access information resources. <b>Standard 2: Information Use</b> Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests. <b>Standard 5: Personal Management</b> Students display evidence of ethical, legal, and social responsibility in regard to information resources and project and self-management.																												
<b>21<sup>st</sup> Century Skills</b> <b>1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks.</b> <b>2. Work independently and collaboratively to solve problems and accomplish goals.</b> <b>3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.</b> <b>4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions.</b> <b>5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving.</b> <b>6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.</b>		<hr style="border-top: 1px dashed black;"/> <b>Key Vocabulary:</b> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Anthropometry</td> <td style="width: 33%;">anagen phase</td> <td style="width: 33%;">agglutination</td> </tr> <tr> <td>Arch</td> <td>telogen phase</td> <td>antibody</td> </tr> <tr> <td>Loop</td> <td>catagen phase</td> <td>antigen</td> </tr> <tr> <td>Whorl</td> <td>cortex</td> <td>plasma</td> </tr> <tr> <td>Latent fingerprinting</td> <td>cuticle</td> <td>erythrocyte</td> </tr> <tr> <td>Visible print</td> <td>medulla</td> <td>blood spatter</td> </tr> <tr> <td>Plastic print</td> <td>follicular tag</td> <td></td> </tr> <tr> <td>Super glue fuming</td> <td>mitochondrial DNA</td> <td></td> </tr> <tr> <td>Minutiae</td> <td></td> <td></td> </tr> </table>		Anthropometry	anagen phase	agglutination	Arch	telogen phase	antibody	Loop	catagen phase	antigen	Whorl	cortex	plasma	Latent fingerprinting	cuticle	erythrocyte	Visible print	medulla	blood spatter	Plastic print	follicular tag		Super glue fuming	mitochondrial DNA		Minutiae		
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<b>. Enduring Understandings:</b> <ul style="list-style-type: none"> <li>• Students will understand how fingerprints are classified through the AFIS system and how this helps to identify criminals.</li> <li>• Students will determine how hair or fiber is retrieved from crime scenes and analyzed to determine origin or be used as comparison to help solve pieces of the crime.</li> <li>• Students will determine the nature of blood and how blood typing and blood spatter analysis can determine many different aspects of the crime</li> </ul>		<b>Essential Questions:</b> <ul style="list-style-type: none"> <li>• How do print patterns and minutiae patterns help to identify a criminal's fingerprints?</li> <li>• How can one determine where a particular piece of hair originated?</li> <li>• How can blood spatter patterns determine how, when and where a person died ?</li> </ul>																												

scene	
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**Learning Objectives / Grade Level Expectations**

*Students will:*

- Identify the three major print patterns and their subclasses.
- Know the different types of minutiae within a print.
- Distinguish visible, plastic and latent fingerprints.
- Describe the concept of the AFIS system.
- List and describe the techniques for developing latent fingerprints on different objects and how to preserve them.
- Identify the morphology of hair structure and phases of growth.
- Be able to identify and differentiate human vs. specific types of animal hair.
- Explain the proper collection of forensic hair and fiber evidence.
- List the properties that are most beneficial for fiber evidence.
- Explain the role of DNA typing in hair evidence.
- Determine how to identify the four blood types from unknown blood.
- Describe how a blood drop can determine the height off the ground the crime was committed.
- Understand antigen-antibody reactions.
- Describe how blood spatter analysis can determine many different conclusions to a crime scene

**ASSESSMENT PLAN**

**Summative Assessment(s)/Performance Based Assessments including 21<sup>st</sup> Century Learning**

- Latent Fingerprinting Lab
- Hair Analysis Lab
- Fiber Analysis Lab
- Blood Typing Lab

**Formative and Diagnostic Assessments:**

- Fingerprinting Card
- Blood Drop Lab Blood Spatter Analysis Lab (s)
- Sam Sheppard Case
- Wayne Williams Case Study
- Fingerprint Quiz
- Hair Analysis Quiz
- Blood Analysis Quiz

**LEARNING PLAN COMPONENTS**

- Classwork
- Homework
- Labs
- Notes
- Video Clips
- Class observations
- Class discussions
- Quizzes

**Stratford Public Schools**  
**Unit Plan for High School Science**  
 Forensic Science Unit # 4

<b>Unit Name:</b> Toxicology		<b>Est. # of Weeks:</b> 2 weeks	
<b>Synopsis:</b> Students will understand how toxicology is an important field in determining the cause of death. Students will also understand the history of drugs and alcohol, the analytical lab tests used to determine the presence of drugs or poisons, the effects on the body and the chemical makeup of each substance.			
<b>STUDENT LEARNING GOALS</b>			
<b>Content-Specific Powered Standards</b> Basic concepts of Biology , Chemistry, and Physics are applied when investigating crime scenes. Understanding chemical processes and organic chemistry allow Forensic scientists to analyze and test for residual drugs and drug metabolites.		<b>Interdisciplinary Standards (Technology Integration)</b>	
		<b>Standard 1: Information Strategies</b> Students determine their need for information and apply strategies to select, locate, and access information resources.	
		<b>Standard 2: Information Use</b> Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests.	
		<b>Standard 3: Information and Technology Application</b> Students use appropriate technologies to create written, visual, oral and multimedia products that communicate ideas and information.	
		<b>Standard 5: Personal Management</b> Students display evidence of ethical, legal, and social responsibility in regard to information resources and project and self-management.	
<b>21<sup>st</sup> Century Skills</b>			
1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks.			
2. Work independently and collaboratively to solve problems and accomplish goals.			
3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.			
4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions.			
5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving.			
6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.			
		<b>Key Vocabulary:</b>	
		Anabolic steroids	psychological dependence      metabolism
		Chromatography	spectrophotometry      oxidation
		Depressant	stimulant
		Hallucinogen	absorption
		Narcotic	excretion
		Physical dependence	fuel cell detector

<p><b>Enduring Understandings:</b></p> <ul style="list-style-type: none"> <li>Students will understand how drugs, poisons and alcohol affect the body and how toxicologists can test for these substances in various ways to determine the cause of death.</li> </ul>	<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>What does a toxicologist do within the field of forensic science?</li> <li>What does a toxicologist need to know in order to determine the cause of death?</li> </ul>
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<p><b>Learning Objectives / Grade Level Expectations</b>  <i>Students will:</i></p> <ul style="list-style-type: none"> <li>Compare and contrast psychological and physical dependence.</li> <li>Name and classify the commonly abused drugs.</li> <li>Describe the lab tests used to perform a drug identification analysis on the body.</li> <li>Understand the proper collection and preservation of drug evidence.</li> <li>Describe and explain gas chromatography and mass spectrometry.</li> <li>Explain how alcohol is absorbed into the bloodstream, transported throughout the body and eliminated by oxidation and excretion.</li> <li>Understand the process by which alcohol is excreted in the breath by the lungs.</li> <li>Understand how fuel cell breath testing is done.</li> <li>Describe the variety of field sobriety tests to assess alcohol impairment.</li> <li>Explain how to properly preserve blood in order to analyze its alcohol content.</li> <li>Describe techniques the toxicologists use to isolate and identify drugs and poisons</li> </ul>
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**ASSESSMENT PLAN**

<p><b>Summative Assessment(s)/Performance Based Assessments including 21<sup>st</sup> Century Learning</b></p> <ul style="list-style-type: none"> <li><b>Classification of drugs</b></li> <li><b>Alcohol Web Quest</b></li> </ul>	<p><b>Formative and Diagnostic Assessments:</b></p> <ul style="list-style-type: none"> <li><b>Presence of Drugs lab</b></li> <li><b>Toxicology quiz</b></li> </ul>
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**LEARNING PLAN COMPONENTS**

<ul style="list-style-type: none"> <li>-Classwork</li> <li>-Homework</li> <li>-Labs</li> <li>-Notes</li> <li>-Video Clips</li> <li>-Class observations</li> <li>-Class discussions</li> <li>-Quizzes</li> </ul>
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<b>understanding, and ethical behavior.</b>	
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<b><u>Enduring Understandings:</u></b>	<b><u>Essential Questions:</u></b>
<ul style="list-style-type: none"> <li>Students will understand how DNA is an indispensable tool to crime scene investigators and how it has helped to solve many crimes in the past decade.</li> </ul>	<ul style="list-style-type: none"> <li>How has the use of DNA technology changed over the last decade?</li> <li>What types of laboratory tests can be used to help solve crimes using DNA evidence?</li> </ul>

<p><b>Learning Objectives / Grade Level Expectations</b></p> <p><i>Students will:</i></p> <ul style="list-style-type: none"> <li>Name the parts of a nucleotide and explain how they are linked to form DNA.</li> <li>Understand the concept of base pairing as it relates to DNA.</li> <li>Explain the process of gel electrophoresis and how it relates to DNA evidence.</li> <li>Describe PCR.</li> <li>Understand the use of CODIS, a DNA computerized database.</li> <li>List the necessary procedures for proper preservation of biological evidence for lab DNA analysis.</li> </ul>
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**ASSESSMENT PLAN**

<b>Summative Assessment(s)/Performance Based Assessments including 21<sup>st</sup> Century Learning</b>	<b>Formative and Diagnostic Assessments:</b>
<ul style="list-style-type: none"> <li><b>Gel Electrophoresis/ DNA Fingerprinting Lab</b></li> </ul>	<ul style="list-style-type: none"> <li><b>DNA Quiz</b></li> </ul>

**LEARNING PLAN COMPONENTS**

<ul style="list-style-type: none"> <li>-Classwork</li> <li>-Homework</li> <li>-Labs</li> <li>-Notes</li> <li>-Video Clips</li> <li>-Class observations</li> <li>-Class discussions</li> <li>-Quizzes</li> </ul>
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**Stratford Public Schools**  
***Unit Plan for High School Science***  
**Forensic Science Unit # 6**

<b>Unit Name:</b> Anthropology	<b>Est. # of Weeks:</b> 2 weeks
<b>Synopsis:</b> Students will understand how the examination of human skeletal remains is important when trying to determine age, race, height and sex.	

**STUDENT LEARNING GOALS**

<b><u>Content-Specific Powered Standards</u></b> Understanding of Anatomy and Physiology concepts allow forensic scientists to identify gender and age when analyzing crime scene evidence.	<b><u>Interdisciplinary Standards (Technology Integration)</u></b> <b>Standard 1: Information Strategies</b> Students determine their need for information and apply strategies to select, locate, and access information resources. <b>Standard 2: Information Use</b>
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<p><b>21<sup>st</sup> Century Skills</b></p> <ol style="list-style-type: none"> <li>1. Use real-world digital and other research tools to access, evaluate, and effectively apply information appropriate for authentic tasks.</li> <li>2. Work independently and collaboratively to solve problems and accomplish goals.</li> <li>3. Communicate information clearly and effectively using a variety of tools/media in varied contexts for a variety of purposes.</li> <li>4. Demonstrate innovation, flexibility, and adaptability in thinking patterns, work habits, and working/learning conditions.</li> <li>5. Effectively apply the analysis, synthesis, and evaluative processes that enable productive problem solving.</li> <li>6. Value and demonstrate personal responsibility, character, cultural understanding, and ethical behavior.</li> </ol>	<p>Students evaluate, analyze, and synthesize information and data to solve problems, conduct research, and pursue personal interests.</p> <p><b>Standard 5: Personal Management</b></p> <p>Students display evidence of ethical, legal, and social responsibility in regard to information resources and project and self-management.</p> <p>-----</p> <p><b>Key Vocabulary:</b></p> <p>Anthropology Femur Tibia Fibula Humerus Radius Ulna ( See Sherlock Bones anatomy sheets for terms)</p>
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<p><b>Enduring Understandings:</b></p> <ul style="list-style-type: none"> <li>• Students will understand how age, sex, height and race determination can be discovered from human skeletal remains.</li> </ul>	<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>• How can an anthropologist determine the age, race, height and sex from human skeletal remains?</li> </ul>
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<p><b>Learning Objectives / Grade Level Expectations</b></p> <p><i>Students will:</i></p> <ul style="list-style-type: none"> <li>• Students will identify the structure and functions of many parts of the human skeletal anatomy.</li> <li>• Students will understand how to determine age, race, sex and height by examining human skeletal remains.</li> <li>• Students will observe how human remains that were discovered thousands of years ago are tested to determine age, race, height, sex and cause of death.</li> </ul>
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<b>ASSESSMENT PLAN</b>	
<p><b>Summative Assessment(s)/Performance Based Assessments including 21<sup>st</sup> Century Learning:</b></p> <ul style="list-style-type: none"> <li>• Sherlock Bones Lab Investigation</li> <li>• Who was the Iceman?</li> </ul>	<p><b>Formative and Diagnostic Assessments:</b></p> <ul style="list-style-type: none"> <li>• Anthropology Quiz</li> <li>• Anatomy of a Skeleton</li> </ul>

<b>LEARNING PLAN COMPONENTS</b>
<ul style="list-style-type: none"> <li>-Classwork</li> <li>-Homework</li> <li>-Labs</li> <li>-Notes</li> <li>-Video Clips</li> <li>-Class observations</li> <li>-Class discussions</li> <li>-Quizzes</li> </ul>

