NEW MILFORD PUBLIC SCHOOLS

New Milford, Connecticut



College Prep Forensic Science

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New Milford's Mission Statement

The mission of the New Milford Public Schools, a collaborative partnership of students, educators, family and community, is to prepare each and every student to compete and excel in an ever-changing world, embrace challenges with vigor, respect and appreciate the worth of every human being, and contribute to society by providing effective instruction and dynamic curriculum, offering a wide range of valuable experiences, and inspiring students to pursue their dreams and aspirations.

Forensic Science Course Overview

Grades 11-12

Forensic Science is an integrated course in which students weave the various core sciences together to problem solve using crime scene scenarios. Students use open-ended inquiry, logic, and analytical thought to make sense of various types of evidence. Students differentiate between classification of evidence (identification, or what something is) and individualization of evidence (the exact source). They learn about careers in forensic science, how to accurately draw a crime scene, how to explain the crime scene with a reconstruction, as well as various landmark cases in forensic science. Technology and laboratory techniques such as glass fracture interpretation, blood spatter reconstruction, gel electrophoresis, fingerprinting analysis, blood typing, hair and fiber analysis, and microscopy may be used. This is a rigorous semester course for academic level credit. Students may contract for honors level credit with teacher recommendation. Additional coursework includes a true crime book report and a scientific journal article summary, as well as more detailed quizzes/tests. For the Landmark Case Project, college prep students may choose to do either a paper or a presentation, whereas honors students must complete both.

Pacing Guide

Introduction to Forensic Science	3 weeks
Physical Evidence and the Crime Scene	4 weeks
Examination of Physical Evidence	5 weeks
Physical Pattern Evidence for Individualization	3 weeks
Biological Evidence	3 weeks

ESTABLISHED GOALS	Tra	ansfer
• CCSS.ELA-Literacy.RST.1 1-12.1 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.	 Students will be able to independently use their Ask questions and define problems Construct explanations and design solut Engage in argument from evidence Value integrity in forensic science and in 	<i>r learning to…</i> ions their educational and personal endeavors
 CCSS.ELA-Literacy.RST.1 	Ме	aning
 CCSS.ELA-Literacy.RST.1 1-12.3 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. CCSS.ELA-Literacy.WHS T.11-12.2.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 	 UNDERSTANDINGS Forensic science is the application of scientific knowledge and techniques to solving crime. Physical evidence is impartial and unbiased, unlike direct evidence (eyewitness testimony). Evidence is only as good as the technology that exists and the expertise of the investigators. A reconstruction must account for all the evidence and is the best explanation for the events which created the evidence. Forensic science provides a major societal benefit, yet costs only a small fraction of what is spent for the entire legal system. Evidence that can be <i>individualized</i> can be narrowed down to one source 	 ESSENTIAL QUESTIONS Students will keep considering What is forensic science, and what is its role in the American legal system? How is the scientific method utilized in forensic science? How is physical evidence created at a crime scene, and how does the forensic scientist use it to answer questions? What role do reconstruction patterns and individualization patterns play in forensic science? What limitations exist in forensic science today?

 and context as well as to the expertise of likely readers. CCSS.ELA-Literacy. WHST.9-12.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) 	 whereas evidence that can be merely classified can be narrowed down to a group. Individualization means to narrow down to one source, whereas classification means to narrow down to a group. 	
or solve a problem;	100	uisition
	Acquisition	
synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.	 Students will know the following: The definition of physical evidence How to maximize the value of physical evidence by maintaining its integrity How to apply the scientific method forensic science disciplines/career opportunities The difference between reconstruction and reenactment Problems with eyewitness testimony The societal benefits of forensic science Individualization vs. classification 	 Identifying whether something is considered physical evidence Correctly applying the scientific method to a situation encountered by a forensic scientist Detailing a day in the life of a forensic scientist of his/her choosing Constructing a reconstruction based on evidence Showing the specific source of a piece of evidence (individualization)

STAGE 2

Codo	Evaluativo Critoria	Assessment Evidence
A, M, T	lab questions & monitoring of proper	PERFORMANCE TASK(S): Students will show that they really understand evidence of
	technique	
		Audience: Classmates, teacher
		Situation: Evidence has been retrieved from crime scene
		Product or Performance: Properly focus microscope and show
		how samples line up and whether a direct match can be declared
		Standards for Success: Student can correctly state whether a
		piece of evidence is a class characteristic whether it has
		potential

		OTHER EVIDENCE: Students will show they have achieved Stage 1 goals by
Α, Μ, Τ	Creative writing exercise will be graded for quality of content specific to the discipline as well as creativity in putting it together	 Formative Jumpstarts Exit tickets Reading guides Lab questions Summative Quiz/test Video questions Creative writing exercise - A day in the life of a forensic scientist List/explanation of forensic science techniques observed in <i>The Bone Collector</i>

Code	Pre-Assessment		
	The pre-assessment will be in the form of a class discussion about what sciences are utilized in solving crimes. Which are more trusted? Which have greater power for reconstruction or individualization?		
	Summary of Key Learning Events and Instruction Student success at transfer meaning and acquisition depends on	Progress Monitoring	
А, М	 NOVA special: Forensic Science on Trial - discusses problems that exist in forensic science. What sciences are more trustworthy? Which can lead to problems/ miscarriages of justice? 	Discussion during video	
А, М, Т А, М А, М, Т	• Forensic specialty writing assignment - "A day in the life of a forensic" (anthropologist, odontologist, sculptor, etc.) - Students will take the information they find about their chosen area to discuss a typical day for that forensic expert. This allows them to be exposed to the variety of areas that exist under the heading "forensic science" while also allowing them to pursue what they are most interested in.	Sharing of examples, review of rubric	
Α, Μ	• Guest speaker to discuss forensic science careers - Exposure to actual forensic scientists really brings the information to life. Students will be prepared with questions to ask, and they will take notes on the speaker's presentation. Students may also evaluate how the presenter's description compares to the description found online (used for their creative writing exercise).	Monitoring student engagement	

• Analyze paper samples under microscope to explore individualization vs. classification - students will compare cut samples vs. torn samples and learn how to focus stereo microscope on edge of paper to examine how they fit together	Monitor microscope usage
• Explain forensic science techniques observed in the movie <i>The Bone Collector,</i> as well as how these techniques help solve the crime. Students get to see a portrayal of forensic science in action.	Discussion during video, providing examples

UbD Template 2.0

Unit 2: Examination of Physical Evidence

ESTABLISHED GOALS	Transfer
 HSN-Q.A.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. HSN-Q.A.2 Define appropriate guartities for 	 Students will be able to independently use their learning to Ask questions and define problems Develop and use models Plan and carry out investigations Analyze and interpret data Construct explanations and design solutions Engage in argument from evidence Value integrity in forensic science and in their educational and personal endeavors
	Meaning

the purpose of descriptive modeling.

- HSN-Q.A.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

UNDERSTANDINGS Students will understand that...

- Physical evidence must be processed in a specific order to maintain its integrity.
- Controls (known, alibi, blank) and substratum comparison are used to maintain the validity and reliability of evidence.
- Physical evidence can tell investigators many important things that may help solve a crime.
- Physical evidence can tell investigators the following important information: develop the assailant's *modus operandi*, provide leads, establish linkages or exclusions, provide corroboration, identify substances, identify people, and establish *corpus delicti*
- The crime scene must be processed in a specific order to maintain its integrity.
- Locard's Exchange Principle states that when objects come into contact, there is a mutual exchange of material between the objects across the contact boundary.
- A reconstruction must account for all the evidence and is the best explanation for the events which created the evidence. Reenactments are speculative and are only partially supported by the evidence.

ESSENTIAL QUESTIONS

- Students will keep considering...
 - How are careful collection and documentation essential to the integrity of forensics evidence?
 - What information can evidence tell investigators about the crime that took place?
 - What role do reconstruction patterns and individualization patterns play in forensic science?
 - How is physical evidence created at a crime scene, and how does the forensic scientist use it to answer questions?

Acquisition		
 Students will know The order of physical evidence processing The importance of controls The order of crime scene processing The important information the physical evidence can provide The purpose of a reconstruction 	 Students will be skilled at Explaining how forensic scientists can use physical evidence to answer questions Writing a detailed reconstruction based on evidence Providing essential documentation for a piece of evidence Creating a druggist fold to contain trace evidence Drawing a crime scene to scale with adequate evidence Providing a reasonable reconstruction for a fictional crime scene based on evidence of students' choosing Applying Locard's Exchange Principle to the examination of an article of the student's clothing 	

STAGE 2

Qada	Freely stires Onitania	
Code	Evaluative Criteria	
		PERFORMANCE TASK(S). Students will show that they really understand evidence of
АМТ	Accuracy of crime scene sketch	Goal: Draw accurate crime scene sketch with accompanying
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	- drawn to scale	
	- sufficient evidence	reconstruction that explains all evidence
	- evidence labelled	Role: Crime scene investigator (CSI)
	 documentation included 	Audience: Judge/jury
	Reconstruction explains evidence and	Situation: Crime scene being documented
	matches the crime scene sketch	Product or Performance: Sketch & reconstruction
	Students may present crime scene to class	Standards for Success: Drawing is to scale, contains a variety of
		evidence, and reconstruction explains all the evidence

A, M, T Evidence found on clothing is packaged in druggist folds with proper documentation. Explanations are provided for evidence found Students attempt to connect activities while wearing shirts with what they found on the shirt. This will demonstrate the accuracy of the Locard Exchange Principle.	OTHER EVIDENCE: Students will show they have achieved Stage 1 goals by Formative • Jumpstarts • Exit tickets • Reading guides • Lab questions • Computer Chip activity • Locard Exchange Principle Lab Summative • Quiz/test • Video questions • Crime scene sketch
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Code	<i>Pre-Assessment</i> The pre-assessment will take the form of a presentation of fossil footprints. What can you observe? What might you infer? What is the <u>best</u> interpretation of the evidence?		
	Summary of Key Learning Events and Instruction Student success at transfer meaning and acquisition depends on	Progress Monitoring	
	Learning Activities:		
Α, Μ	• Fossil evidence lab - Students explain a series of fossil footprints in a reconstruction that factors in all observations but also uses common sense.	Ask students to explain their reasoning	
A, M, T	• The Case of the Missing Computer Chip activity - Students sort through clues to determine the most likely scenario that led to the theft of a computer chip. They will be put in groups of 3-4, then groups will be joined, then final class discussion. Most likely reconstruction will be discussed as a class.	Ask student groups to explain their reasoning, have them collaborate with other groups	
Α, Μ, Τ	• Crime scene sketch and reconstruction - Students come up with a creative crime scene that is explained in a reconstruction that factors in all the evidence. May work alone or in groups of 2-3.	Remind students or rubric, discuss common misconceptions	
Α, Μ	 Article: reconstruction vs. reenactment - Scenario of shooting reconstruction is discussed. How does this differ from a reenactment? Class discussion will address why a reconstruction is more scientific than a reenactment. 	Class discussion	

ESTABLISHED GOALS	Transfer	
school goals (Power standards).	Students will be able to independently use their	r learning to
 HS-PS3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects). CCSS.ELA-Literacy. RST.9-10.8 Assess the extent to which the 		explain/troubleshoot errors ns onal thinking gn solutions ce a variety of formats. and varied sources to accomplish a specific task. en conducting research. s when presenting to varied audiences e and in their educational and personal endeavors
a text support the author's	Ме	eaning
 claim or a recommendation for solving a scientific or technical problem. CCSS.ELA-Literacy.RST.1 1-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific 	 UNDERSTANDINGS Students will understand that Reconstruction patterns can only be "collected" through thorough documentation. Blood spatter is created according to well-known physical laws. Factors that affect glass fracture patterns can indicate direction and order of multiple impacts. Radial fractures emanate from the projectile impact and move toward the 	 ESSENTIAL QUESTIONS Students will keep considering What role do reconstruction patterns and individualization patterns play in forensic science? What role does physical evidence play in the development of a reconstruction? What makes direct physical matching more inherently convincing than indirect matches?

 results based on explanations in the text. CCSS.ELA-Literacy. RST.11-12.7 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. CCSS.ELA-Literacy. WHST.9-12.7 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 	 edge, whereas tangential fractures encircle the point of impact. Individualization requires physical matching between an evidentiary specimen and a known specimen. Direct physical matches allow the matching of a known sample to the unknown sample (evidentiary specimen) with certainty. Direct physical matches are more convincing that two objects were once part of the same object than indirect physical matches. 		
	synthesize multiple	Aca	uisition
	sources on the subject	Students will know	Students will be skilled at
	demonstrating	Examples of reconstruction	Brainstorming factors that affect
	understanding of the	patterns	the appearance of blood spatter
	subject under	 Factors that affect blood spatter 	and manipulate those factors to
	investigation.	patterns	generate data.
•	CCSS.ELA-Literacy.	 Factors that affect glass fracture 	Explaining data generated by blood
	WHST.11-12.8 Gather	 Direct vs. indirect matches 	spatter experiment.
	relevant information from	 Radial vs. tangential fractures 	Drawing glass fracture pattern
	multiple authoritative print	<u>:</u>	showing the result of multiple
	and digital sources, using		Impacts.
	effectively: assess the		Reconstructing solid glass object using knowledge of impact patterns
	strengths and limitations		and direct/indirect physical
	of each source in terms of		

the specific task, purpose,	matches.
and audience: integrate	
information into the text	
selectively to maintain the	
flow of ideas, avoiding	
nlagiarism and	
overreliance on any one	
source and following a	
standard format for	
citation	
• CCSS.ELA-Literacy.	
SL.11-12.4 Present claims	
and findings emphasizing	
colient pointe in a focused	
salient points in a locuseu,	
coherent manner with	
relevant evidence, sound	
valid reasoning and	
well-chosen details, use	
appropriate eye contact,	
adequate volume, and	
clear pronunciation	

STAGE 2

Code	Evoluctivo Critorio	Accomment Evidence
Code		Assessment Evidence PERFORMANCE TASK(S): Students will show that they really understand evidence of Goal: Lab report
A, M, T	Lab report rubric	Role: Forensic scientist conducting experiment in laboratory
		Audience: Other forensic scientists
		Situation: Evidence being analyzed in laboratory for validity &
		reliability
		Product or Performance: Lab Report
		Standards for Success: Experimental design generates reliable
		quantitative data. Conclusions explain data and reflect on
		validity and reliability of data/experiment.

	OTHER EVIDENCE: Students will show they have achieved Stage 1 goals by
	 Formative Jumpstarts Exit tickets Reading guides Blood spatter lab (development of procedure and data collection) Research progress in class/LLC
Landmark Case Rubric	Summative • Quiz/test • Video questions • Blood spatter lab report • Landmark Case Project

Code	Pre-Assessment		
	Questions to help complete this portion:		
	This pre-assessment involves asking students how blood spatte	r can provide a window into what happened at a	
	chime scene. How could you design an experiment to prove the	connection between blood spatter and the actions	
	hypothesis to connect IV and DV and a scientific explanation of	the relationship?	
	Summary of Key Learning Events and Instruction Student success at transfer meaning and acquisition depends on	Progress Monitoring	
	Learning Activities:		
А, М	• A Killer's Trail (documentary of Dr. Sam Sheppard)	Discussion of important points during video	
A, M,T	• Blood spatter lab - Students (in pairs) will design 2 experiments that test the effect of a variable on the appearance of blood spatter. Students will be asked what might create blood spatter at a crime scene, and then will be encouraged to create an experimental scenario to simulate it. Eventually they must generate data (at least one of the experiments must generate quantitative data), which will lead to a complete lab report.	Multiple check-ins during planning, conducting, and interpreting of experiment	
А, М	• Who Shot Ard Dia bullet reconstruction - Students will be shown how to draw fractures in glass, then will have to reproduce a particular scenario correctly and write a corresponding reconstruction	Monitor correct drawing	
А, М	 Create footprint casts using dental stone 	Monitor correct procedure mixing dental stone, pouring mixture, and cleaning of cast	
A, M	Glass bottle reconstruction	Monitor careful building of bottle	

A, M, T	 Landmark Case Research - demonstration of online search tools/databases in LLC 	Multiple check-ins with students on research, providing feedback on rough drafts
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UbD Template 2.0

Unit 4: Physical Pattern Evidence for Individualization

ESTABLISHED GOALS	Tra	ansfer
 CCSS.ELA-Literacy.RST.1 1-12.7 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. 	 Students will be able to independently use their learning to Integrate evidence from multiple and varied sources to accomplish a specific task Ask questions and define problems Plan and carry out investigations Analyze and interpret data Construct explanations and design solutions Engage in argument from evidence Value integrity in forensic science and in their educational and personal endeavors 	
T.9-12.9 Draw evidence	Meaning	
from informational texts to support analysis, reflection, and research.	 UNDERSTANDINGS Students will understand that Biometric measures have the power to individualize when used properly. Biometric measures include fingerprints, retina/iris scans, dental records, DNA analysis, face thermography, and others. 	 ESSENTIAL QUESTIONS Students will keep considering What role do biometric measures play in individualization? What is the value of questioned documents in a forensic investigation?

 Fingerprints may be developed using physical or chemical methods. AFIS (Automated Fingerprint Identification System) has revolutionized the examination of fingerprint evidence. A questioned document is any means of communication that is suspect as to its authenticity or origin. 	
Acq	uisition
 Students will know the following: Types of biometric measures How do develop fingerprints How to handle questioned documents Type of questioned documents 	 Students will be skilled at Developing and collecting fingerprints using magnetic powder and tape Developing and collecting fingerprints using a chemical method such as superglue, ninhydrin, or iodine fuming. Identifying whether a fingerprint is an arch, loop, or whorl pattern and the minutiae it contains. Providing examples of questioned documents

Code	Evaluative Criteria	Assessment Evidence
		PERFORMANCE TASK(S):
		Students will show that they really understand evidence of
A, M, T	Students will be monitored to ensure that	Goal: Collect fingerprints from surfaces around the school
	proper technique is used. Students sometimes have a difficult time finding prints,	Role: Dactyloscopist (fingerprint expert)
	and the quality is poor, so this assignment is	Audience: Superior officer, judge/jury
	dissuade students from creating their own	Situation: Prints left at crime scene
	fingerprints and lifting them). Students who	Product or Performance: Fingerprint cards with documentation
	points.	Standards for Success: Can locate fingerprints on surfaces
		students are likely to touch, can identify print as arch, loop, or
		whorl, and can identify at least one minutiae point on each print

 OTHER EVIDENCE: Students will show they have achieved Stage 1 goals by Formative Jumpstarts Exit tickets Reading guides Demonstration of proper fingerprint development/collection technique Video clip: Death Grip (Vernon Mathis Robinson case)
 Article: Remains of the Day – details difficulties in separating 9/11 victims remains from those of the terrorists Summative Quizzes/tests Proper identification of arch, loop, whorl on fingerprint sheets Proper identification of minutiae for purposes of matching 2 fingerprints

Code	Pre-Assessment This pre-assessment will take the form of a class discussion. Student will be asked "why are fingerprints so commonly used in forensic science?" This will eventually lead to the discovery that they are unique (different among different people), do not change (stay constant throughout life), and can be classified (grouped according to common characteristics).	
	Summary of Key Learning Events and Instruction Student success at transfer meaning and acquisition depends on	Progress Monitoring
А, М	 Learning Activities: Development and collection of fingerprints at students desks 	Monitoring of proper technique
A, M, T	 Discovery, development, and collection of fingerprints around school 	Monitoring of proper technique
А, М	 Superglue fuming technique - Students will be shown proper technique, then will answer questions about the process. Information from books and online research will supplement what they see happening. 	Monitoring of proper technique
А, М	• Video clip: <i>Death Grip</i> (Vernon Mathis Robinson case) - Discussion of how a case was solved using only fingerprint evidence, 25 years after the crime.	Discussion of case during/after video

Unit 5: Biological Evidence

 ESTABLISHED GOALS HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring. HS-LS3-3. Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population. 	Transfer	
	 Students will be able to independently use their learning to Ask questions and define problems Develop and use models Plan and carry out investigations Analyze and interpret data Construct explanations and design solutions Engage in argument from evidence Value integrity in forensic science and in their educational and personal endeavors 	
	Meaning	
	 UNDERSTANDINGS Students will understand that Blood and other biological material must be handled carefully to avoid decomposition and contamination. Blood typing allows for exclusion of suspects, but cannot individualize. Antigens on the surface of blood cells stimulate the production of antibodies, causing agglutination (clotting). This phenomenon allows for the identification of blood type. Blood and other biological material is collected/preserved/packaged/ analyzed in order to minimize decomposition and contamination to maximize its validity. 	 ESSENTIAL QUESTIONS Students will keep considering How has biological technology revolutionized forensic science? How does the structure of DNA allow for individualization? What is the value of multiple pieces of coinciding evidence?

 The structure of DNA determines its function in organisms. Except for identical twins, individuals have a unique DNA sequence that can be distinguished from all other people on the planet. The value of multiple pieces of evidence can be quantified by multiplying the likelihood of each independent event together to get a total probability of the events' occurring together. DNA evidence is increasingly used (RFLP, PCR, STR), and CODIS (Combined DNA Index System) plays an increasingly important role in matching a suspect to a crime. 	
Acq	uisition
 Students will know The relationship between antigens and antibodies The proper way to handle biological evidence to maximize its integrity Every cell in the body contains DNA except for red blood cells. Everyone's DNA is unique (except for identical twins). 	 Students will be skilled at Performing preliminary tests to indicate the presence of blood and confirmatory tests to indicate the specific blood type Demonstrating blood type inheritance in a Punnett square When presented with multiple pieces of evidence, students will multiply the likelihood of each together to determine the total probability. Performing the steps of gel electrophoresis Interpreting the banding pattern in an electrophoresis gel

Code	Evaluative Criteria	Assessment Evidence
	_	PERFORMANCE TASK(S):
Α, Μ, Τ	Lab sheet with questions. Students	Students will show that they really understand evidence of
	must interpret their blood type data to	Goal: Use preliminary and confirmatory blood tests to ascertain the
	determine the guilty person. Class discussion will follow to compare	most likely suspect in a murder investigation
	accuracy of blood typing to DNA	Role: Forensic biologist
	proming.	Audience: Judge/jury
		Situation: Blood typing of two suspects accused of murder, seeing
		whether their blood matches that of the victim
		Product or Performance: Lab sheet with data table and questions

	OTHER EVIDENCE: Students will show they have achieved Stage 1 goals by
	 Formative Jumpstarts Exit tickets Probability questions Blood typing using phenolphthalein (preliminary test) and simulated antisera (confirmatory test) Punnett squares Hair analysis lab Summative Quiz/test Blood typing lab, correctly interpreting results PCR lab packet

Code	Pre-Assessm Students will be asked about the power of DNA to individualize. powerful tool for forensic science?	<i>ent</i> What about the structure of DNA makes it such a
	Summary of Key Learning Events and Instruction Student success at transfer meaning and acquisition depends on	Progress Monitoring
Α, Μ	 Learning Activities: Probability activity - Class activity using clothing colors to calculate total probability of leaving 2 different colored threads at a crime scene. Calculations will be done as a class to show that individual probabilities are multiplied to get total probability. 	Go over calculations in class
A, M, T	 Punnett squares showing inheritance of blood types - Students will fill out Punnett squares and interpret what they show. 	Practice as a class
A, M, T	• Blood typing lab (explained in "performance tasks")	Monitor student progress
A, M	 PCR/DNA electrophoresis lab with demonstration of micropipetting technique, pouring of gel, loading of gel, and interpreting of bands. 	Monitor student technique
A, M	 Virtual Lab of gel electrophoresis (Gizmo) - same as above, just in a virtual version 	Monitor steps of lab
Α, Μ	• New York Times video clip: <i>How DNA changed the world of forensic science</i> – focuses on how hair evidence used prior to DNA analysis has been shown to be unreliable	Class discussion

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