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CSI: Who Killed Henry Ward? Lab Activity

Aligned With All Published National Standards

IMGN 250 8038

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standards alignment

framework for K-12 science education © 2012

* The Dimension I practices listed below are called out as **bold** words throughout the activity.

DIMENSION 1 Science and Engineering Practices

X	Asking questions (for science) and defining problems (for engineering)	X	Use mathematics and computational thinking
X	Developing and using models	X	Constructing explanations (for science) and designing solutions (for engineering)
X	Planning and carrying out investigations	X	Engaging in argument from evidence
X	Analyzing and interpreting data	X	Obtaining, evaluating, and communicating information

DIMENSION 2 Cross Cutting Concepts

X	Patterns		Energy and matter: Flows, cycles, and conservation
	Cause and effect: Mechanism and explanation	X	Structure and function
X	Scale, proportion, and quantity		Stability and change
	Systems and system models		

X Indicates standards covered in activity

DIMENSION 3 Core Concepts

Discipline	Core Idea Focus
Life Science	LS1: From Molecules to Organisms: Structures and Processes
	LS2: Ecosystems: Interactions, Energy, and Dynamics
	LS3 Heredity: Inheritance and Variations of Traits
	LS4: Biological Evolution: Unity and Diversity
Physical Science	PS2: Motion and Stability: Forces and Interactions

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Middle School Standards Covered	High School Standards Covered
MS.LS1-1: Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.	HS.LS1-2: Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
MS.LS1-2: Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	HS.LS2-2: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.
MS.LS4-2: Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.	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.

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Middle School Standards Covered	High School Standards Covered
MS.PS2-1: Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.	HS.LS3-3: Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.
MS.PS2-2: Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	HS.LS4-3: Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.
MS.PS2-4: Construct and present arguments using evidence to support the claims that gravitational interactions are attractive and depend on the masses of interacting objects.	HS.PS2-1: Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.
	HS.PS2-4: Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.

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Content Standards (K-12)			
X	Systems, order, and organization	X	Evolution and equilibrium
X	Evidence, models, and explanation	X	Form and Function
X	Constancy, change, and measurement		

Life Science Standards Middle School		Life Science Standards High School	
X	Structure and Function in Living System	X	The Cell
X	Reproduction and Heredity	X	Molecular Basis of Heredity
X	Populations and Ecosystems	X	Biological Evolution
X	Diversity and Adaptations of Organisms		
Physical Science Standards Middle School		**Physical Science Standards High School**	
X	Properties and Changes of Properties in Matter	X	Structure and Properties of Matter
X	Motions and Forces	X	Motions and Forces
Science in Personal and Social Perspectives Standards Middle School			
X	Science and Technology in Society		

X Indicates standards covered in activity

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standards/learning objectives

benchmarks for science literacy (AAAS, © 1993)

1. The Nature of Science	1B: Scientific Inquiry
	1C: The Scientific Enterprise
2. The Nature of Mathematics	2A: Patterns and Relationships
	2B: Mathematics, Science, and Technology
3. The Nature of Technology	3A: Technology and Science
4. The Physical Setting	4D: Structure of Matter
	4F: Motion
	4G: Forces of Nature
5. The Living Environment	5A: Diversity of Life
	5B: Heredity
	5C: Cells
	5F: Evolution of Life
6. The Human Organism	6A: Human Identity
	6B: Human Development
	6C: Basic Functions
9. The Mathematical World	9B: Symbolic Relationships
	9C: Shapes
11.Common Themes	11A. Systems
	11B. Models
	11C: Constancy and Change

activity objectives:

- Become familiar with and apply a variety of forensic techniques to examine the evidence obtained from a crime scene.
- Utilize critical thinking skills to determine the likely perpetrator of the unsolved crime involving Henry Ward.

time requirement:

The time it will take to complete the entire activity will vary depending on the set-up method chosen by the instructor. Minimally, you should allow at least four lab periods to complete the entire activity.

- Module 1: Hair analysis
- Module 2: Bone analysis
- Module 3: Fingerprint analysis
- Module 4: Blood typing
- Module 5: Impression analysis (footprints & tires)
- Module 6: Blood spatter analysis
- Module 7: DNA Fingerprinting (as a class)
- Summary of Evidence (as a class)