



5-E CLASSROOM STEM ACTIVITY:
WINNING THE CASE WITH FORENSICS

By Dr. Alexandra Owens

FANGIRL REACHES THE BAR

BY SUE HAMILTON

Phylicia Rashad portrayed such a successful lawyer and strong mother as Clair Huxtable on *The Cosby Show* in the late 1980s that Terria Blunt was inspired to believe “Hey, I can do that!”

From her fascination with that television show as a young girl, Terria never lost her interest in a law career. She has worked in the legal field for 10 years in many law offices in many different positions and is currently a legal/law assistant for an attorney.

Paralegals and legal assistants perform many of the duties an attorney would do if she did not hire such a professional. “I am generally the first point of contact for clients,” Terria reports of her current job. “I speak with them about their case and assess their legal needs.” Legal assistants, also known as paralegals, do legal research and draft pleadings, contracts, leases, and other court and legal documents. “If the case goes to trial, then I usually attend the trial to assist the lawyer,” explains Terria.

Although legal assistants perform many tasks in a law office, they cannot give legal advice or guide clients toward one course of action or another. They also cannot sign pleadings or other documents, which must be reviewed and signed by the attorney.

The experience gained from working with her current employer has been important to Terria. “She has given me hands-on experiences by allowing me to attend numerous trials and work in the forefront with her on cases, not just in the background. The skills I have learned from working with her are invaluable.” Terria has also pursued additional education and is very proud of the fact that she graduated from the Nashville School of Law last year where she earned her Juris Doctor degree and is preparing to take the bar exam.

An associate or bachelor’s degree is required for the position of legal assistant, and Terria received her bachelor’s degree in political science. But she cautions students interested in a paralegal career

that there are also paralegal or specific certification courses that may be required for work in some positions.

STEM skills required for the job of legal assistant vary depending on the type of law practiced by the attorney or law firm which employs them. Those working in bankruptcy, real estate, business law, and estates, for example, must have strong math skills. Paralegals in a criminal law firm may need forensic science skills. All legal assistants, however, need technological skills as all of their work in research, drafting documents, and preparing clients’ reports is done on a computer. Many online legal research programs assist paralegals with this important part of their job.

Terria reports the most challenging part of her job is prioritizing tasks. “This job is very demanding and I must be able to manage my time and use it efficiently. I must also be creative, flexible, and able to solve problems.”

There are many STEM roles available in the field of law and justice, Terria explains, and the options are limitless. In addition to legal assistants, lawyers often require assistance from medical experts for injury and accident cases, mechanical engineers in product liability matters, e-discovery professionals in identity theft and cyber fraud, and accountants for determining business planning and valuation.

Terria advises students interested in a law career to gain as much knowledge about it as possible. “Connect with someone in the legal field. Research the different types of law and find the ones that interest you,” she suggests. “Consider interning at a law firm, and if you find that you really want to pursue a career in law, go for it. All things are possible if you believe in yourself.”

“I MUST BE CREATIVE, FLEXIBLE, AND ABLE TO SOLVE PROBLEMS.”



TERRIA BLUNT
LAW ASSISTANT/ASSOCIATE
DEGREES: BACHELOR'S
DEGREE IN POLITICAL
SCIENCE, JURIS DOCTOR (JD)
YEARS IN THE INDUSTRY: 10
STEM TYPE: ADVISOR



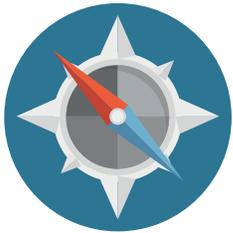
5-E CLASSROOM STEM ACTIVITY: WINNING THE CASE WITH FORENSICS

Here are some ideas for how high school teachers could use this story as a launching point for integrated STEM learning. Our activities follow the 5-E Learning Cycle Model.



Part 1: Engage

- ① Hold a class discussion about what students know about forensic science from media.
 - a. What do forensic scientists do?
 - b. How does forensics play a role in the courtroom?
 - c. Are forensic scientists always right?
- ② Have students read the article “Fangirl Reaches the Bar” in *STEM Jobs* magazine. Discuss the following questions:
 - a. What are the various duties of a paralegal? Did any surprise you?
 - b. Why do desired STEM skills for a career in law vary so greatly?
 - c. How could your STEM interests lend to a legal case?
- ③ Show students the video “Forensic Evidence and Expertise in the Court” found at edu.STEMjobs.com/teacher-resources in order to further explain how forensics are used in court.



Part 2: Explore

- ① Break students into groups of three or four. Explain that in today’s lesson, groups will be researching various forensic techniques used in court, as well as proper procedures to ensure validity in conviction.
- ② Assign or allow groups to select a forensic field from the list below. Potential forensics specialties include, but are not limited to:
 - a. DNA Analysis
 - b. Blood Analysis
 - c. Fingerprint Analysis
 - d. Hair and Fiber Analysis
 - e. Ballistics
 - f. Toxicology
 - g. Computer and Databases
 - h. Lie Detection
- ③ Provide time for students to research and discuss what they have learned.
- ④ Challenge students to consider how valid and reliable each of these tests may be in court, and procedures put in place to ensure reliability.



Part 3: Explain

- ① Have groups create a short presentation of their research to share with the class. Presentations should include a scientific description, evidence collection methods, testing procedures and protocols, and examples of court cases in which their forensic field was key. Each member should share the information for which they were responsible. Students should use presentation software such as PowerPoint or Google Slides.
- ② When ready, have students share their presentations with the class.
- ③ Allow classmates to ask clarifying questions following each presentation.



Part 4: Elaborate

- ① Inform students that unfortunately there are some cases that end in wrongful conviction, and forensics can play a role in this. In some cases, incorrect procedures and testimony may have swayed a jury. In other cases, new forensic analysis may provide evidence that someone is innocent.
- ② Show students the Innocence Project website found at edu.STEMjobs.com/teacher-resources. This organization aims to exonerate those that are wrongfully convicted using forensic evidence, primarily DNA.
- ③ Allow students to explore this website and read about some of the cases.
- ④ Ask students to reflect on their research.
What practices need to be in place to prevent wrongful conviction with their forensic test?
- ⑤ Have students write a proposal about how the forensic field they researched can be safeguarded to give to a local forensic office.
- ⑥ If possible, have local law enforcement, lawyers, or forensic scientists visit your classroom to share their experiences and read student proposals.



Part 5: Evaluate

Students will be evaluated for their presentations and proposals using the following rubric. Provide the rubric at the beginning of the lesson to clarify expectations and objectives. Each group will be graded, therefore all students in the group will receive the same score.

Scoring Rubric	
___ /10	Forensic Presentation Was accurate information presented? Did the presentation include evidence collection, testing procedures and protocols, and court case examples? Was the presentation clean and easy to understand?
___ /20	Innocence Project Proposal Was the proposal clear and accurate? Did the proposal address concerns of validity and reliability for the forensic testing procedure? Did the proposal include details of revisions needed?
___ /10	Participation Did each student contribute to the overall project? Did each student assist in research, presentation, and proposal creation?
___ /50	Total

Standards Addressed:

Common Core State Standards - Math

CCSS.MATH.PRACTICE.MP1 Make sense of problems and persevere in solving them.

CCSS.MATH.PRACTICE.MP2 Reason abstractly and quantitatively.

CCSS.MATH.PRACTICE.MP4 Model with mathematics.

Common Core State Standards - ELA

CCSS.ELA-LITERACY.RST.9-10.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

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.RST.11-12.9 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.

CCSS.ELA-LITERACY.SL.9-10/11-12.1 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led)

with diverse partners on grades 9-10/11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.

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 inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

CCSS.ELA-LITERACY.WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research.

Next Generation Science Standards

Potential Standards Include:

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.

Science and Engineering Practices

Constructing Explanations and Designing Solutions. Evaluate a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Disciplinary Core Ideas

ETS1.B: Developing Possible Solutions

When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts.

Crosscutting Concepts

Influence of Science, Engineering, and Technology on Society and the Natural World. New technologies can have deep impacts on society and the environment, including some that were not anticipated. Analysis of costs and benefits is a critical aspect of decisions about technology.

HS-LS1-3 Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

Science and Engineering Practices

Scientific Investigations Use a Variety of Methods. Scientific inquiry is characterized by a common set of values that include:

logical thinking, precision, open-mindedness, objectivity, skepticism, replicability of results, and honest and ethical reporting of findings.

Disciplinary Core Ideas

LS1.A: Structure and Function

Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system.

HS-LS3-3 Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

Science and Engineering Practices

Analyzing and Interpreting Data. Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.

Disciplinary Core Ideas

LS3.B: Variation of Traits

Environmental factors also affect expression of traits, and hence affect the probability of occurrences of traits in a population.

Thus the variation and distribution of traits observed depends on both genetic and environmental factors.

Crosscutting Concepts

Science is a Human Endeavor.

Technological advances have influenced the progress of science and science has influenced advances in technology.

Science and engineering are influenced by society and society is influenced by science and engineering.

Standards Addressed (Cont.):

Next Generation Science Standards (Cont.)

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.

Science and Engineering Practices

Analyzing and Interpreting Data. Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena.

Theories and laws provide explanations in science.

Laws are statements or descriptions of the relationships among observable phenomena.

Disciplinary Core Ideas

PS2.A: Forces and Motion

Newton's second law accurately predicts changes in the motion of macroscopic objects.

Crosscutting Concepts

Cause and Effect. Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.

Texas Essential Knowledge and Skills - Math

A.1.A apply mathematics to problems arising in everyday life, society, and the workplace.

A.1.B use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.

A.1.D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.

Texas Essential Knowledge and Skills - Science

B.3, C.3, P.3 The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom.

B.6.E Identify and illustrate changes in DNA and evaluate the significance of these changes.

B.11.A Describe the role of internal feedback mechanisms in the maintenance of homeostasis.

P.4.D Calculate the effect of forces on objects, including the law of inertia, the relationship between force and acceleration, and the nature of force pairs between objects.