



5-E CLASSROOM STEM ACTIVITY:
HEARING BOTH SIDES

By Dr. Alexandra Owens

TEACHING THE LAW

BY SUE HAMILTON

Lawyers are really good at those basics learned since elementary school—reading and writing. They take it one step further by combining those skills to become excellent researchers, studying case law, statutes, court rules, and any court ruling that will help them win a case. Spending hours at a computer with an online legal research service doesn't sound very exciting, but

that preparation allows an attorney to make the arguments that win cases.

Kim Grippa, a 20-year member of the Florida bar, never planned to be a lawyer and thought she would be a college professor. "I did, however, have an interest in the law and enjoyed reading, researching, and writing, which are a big part of legal studies." After working as an



“SUCCESSFUL ATTORNEYS HAVE SHARP ANALYTICAL SKILLS AND ARE ABLE TO EXTENSIVELY RESEARCH A TOPIC AND THEN DRAW LOGICAL CONCLUSIONS FROM THE RESEARCH RESULTS.”

KIM GRIPPA

SENIOR PROFESSOR & DEPARTMENT CHAIR,
DAYTONA STATE COLLEGE SCHOOL
OF BUSINESS ADMINISTRATION
DEGREES: JURIS DOCTOR AND BACHELOR'S
IN BUSINESS ADMINISTRATION
YEARS IN THE INDUSTRY: MEMBER OF THE
FLORIDA BAR FOR 20 YEARS
STEM TYPE: DESIGNER



attorney, she was able to attain that original goal in her current position as senior professor and department chair at the Daytona State College School of Business Administration. “I love learning and being in school which is why I pursued a graduate degree and now work at a college!”

After earning a bachelor’s and a Juris Doctor degree, she passed the required Florida bar exam and a Multistate Professional Responsibility Exam. She then added a bachelor’s degree in business administration. But in addition to her education, Kim believes her experiences as a practicing attorney are very valuable for her teaching career. “It is important that students understand not only legal principles, but also how those principles are applied. The real-life cases I have worked on provide many examples to use on the application side.”

As a senior college professor, Kim teaches courses, serves on college committees, and develops new courses. She also advises and mentors students and new faculty members. Her administrative role as department chair requires her to schedule courses for the college’s Associate of Science degrees, certificates in the School of Business Administration, and the Bachelor of Applied Science in supervision and management courses. Duties in this role also include hiring and evaluating faculty, managing a budget, and developing and marketing new degree programs.

Kim’s job is challenging as she reports there is never enough time to get her work done and attend all of the meetings scheduled as part of her administrative role. “But each day is different and presents new challenges,” Kim explains. “Even if I start the day with a plan, the day usually does not unfold according to

plan. I have learned to prioritize and be flexible.” There are rewarding moments in her job, too, and Kim loves getting to help her students. “I get to help someone every day, whether it is a future student trying to decide on a course of study or an existing student dealing with academic and/or life challenges.” An email from a former student who thanked Kim for encouraging her to succeed and help her believe in herself was not only rewarding, but a reminder of why she wanted to teach!

Many STEM skills are used by Kim in her job as department chair. Data analysis is a big part of her job. To effectively schedule college courses, she must analyze enrollment trends and projections of future enrollment growth and decline. Deciding which new degree programs to develop and when to implement them also requires analysis of employment trends and projection of job growth, Kim explains. “The college’s goal is to deliver innovative degrees that prepare students for the job market they will enter after graduation. The ability to analyze data effectively makes this goal a reality.”

Kim first developed those STEM skills as an attorney because clients depend on their lawyer’s ability to problem solve. “Successful attorneys have sharp analytical skills and are able to extensively research a topic and then draw logical conclusions from the research results.”

Learning new things continues to be a goal for Kim. She recently took a course to become certified by the Florida Supreme Court as a Circuit Court mediator. “I strive to continually expand my knowledge base and diversify my skills,” Kim explains. “I then have the opportunity to incorporate my learning into my courses so my students can benefit as well.”

Students interested in a law career should take courses to allow them to develop writing, research, and critical reading skills, recommends Kim. “Think outside the box,” she advises. “There are many opportunities for those with a law degree outside of the typical private firm setting. Set a goal and make it happen!”

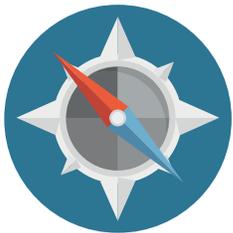
5-E CLASSROOM STEM ACTIVITY: TREATING THE TEAM

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 the career of an attorney.
 - a. From what you know about attorneys from media or experience, what does an attorney do? What tasks take up the majority of their time?
 - b. How may this career relate to the STEM fields?
- ② Have students read the article "Teaching the Law" in STEM Jobs magazine. Discuss the following questions:
 - a. Why is research an essential component of being an attorney?
 - b. What other STEM skills are required to be a successful attorney?
 - c. Did any of these skill surprise you?
- ③ Explain that today students will get a chance to put skills into practice by taking part in a debate about a STEM topic.



Part 2: Explore

- ① As a class, select a STEM topic of interest to debate. You may choose to select the topic yourself prior to class to highlight specific content you'd like to review or revisit. Potential topics include, but are in no way limited to:
 - a. Climate change
 - b. Deforestation
 - c. Renewable energy sources
 - d. Genetic engineering or cloning
 - e. Blood doping
 - f. Space mission to Mars
 - g. Animal testing
 - h. Taxation of junk food
 - i. Internet and social media
- ② Once a debate topic has been selected, ask students to research the topic as though they are an attorney. This may be done as a group or individually. You may allow students to choose which side they would like to defend in a debate, or if it appears that most students would select the same side, assign roles to ensure a balanced debate.
- ③ Students should take notes during the research process to support their claims.
- ④ Once research is complete, have students create a 30 second opening argument to present their side.



Part 3: Explain

- ① Arrange desks in a circle or large rectangle for the debate portion of this lesson. Ask students to create name placards by folding a piece of cardstock.
- ② Explain the rules of the debate:
 - a. Each student will have a turn sharing their opening statement, which must be 30 seconds or less.
 - b. While others are speaking, take notes for rebuttal.
 - c. If you would like to speak, place your name placard vertical to alert the moderator that you would like to speak.
 - d. You may only speak when called on. Keep your statement on topic and do not attack others.
 - e. After 30 minutes (or time predetermined), each student will have 30 seconds to make a closing argument.
 - f. The debate will conclude with a class vote. Students should vote however they have been persuaded during the debate.
- ③ Act as moderator throughout the debate by calling on those who may speak and moving on when points are too long. You may set a limit or requirement as to the number of times one student may talk depending on your class.
- ④ Remind students to stay on topic as needed.



Part 4: Elaborate

- ① At the conclusion of the debate, ask students to write a persuasive essay about the debate topic. The side they select may have changed over the course of the debate.
- ② Encourage students to integrate facts and talking points presented by their classmates.
- ③ Have students share their persuasive essays with a peer partner. Were they convinced?
- ④ If possible, display student work in a common area of the school.



Part 5: Evaluate

Students will be evaluated during the debate using the following rubric.
Provide the rubric at the beginning of the lesson to clarify expectations and objectives.

Scoring Rubric

___ /10 **Research**

Was research on the debate topic completed? Were both sides considered?
Was evidence collected for use in the debate?

___ /20 **Debate Participation**

Did the student contribute to the debate? Was the opening statement clear and persuasive?
Did the student take notes and reflect on what others were saying?
Was the closing statement clear and persuasive?

___ /20 **Persuasive Essay**

Did the persuasive essay include research and facts? Was the essay clean and easy to understand?
Was it persuasive?

___ /50 **Total**

Standards Addressed:

Note: Content-specific standards will vary greatly based on the topic selected for the debate.

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

Possible Standards Include:

HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

Science and Engineering Practices

Constructing Explanations and Designing Solutions. Refine 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

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

Anthropogenic changes (induced by human activity) in the environment—including habitat destruction, pollution, introduction of invasive species, overexploitation, and climate change—can disrupt an ecosystem and threaten the survival of some species.

LS4.D: Biodiversity and Humans

Biodiversity is increased by the formation of new species (speciation) and decreased by the loss of species (extinction).

Humans depend on the living world for the resources and other benefits provided by biodiversity. But human activity is also having adverse impacts on biodiversity through overpopulation, overexploitation, habitat destruction, pollution, introduction of invasive species, and climate change. Thus sustaining biodiversity so that ecosystem functioning and productivity are maintained is essential to supporting and enhancing life on Earth. Sustaining biodiversity also aids humanity by preserving landscapes of recreational or inspirational value.

Crosscutting Concepts

Stability and Change. Much of science deals with constructing explanations of how things change and how they remain stable.

HS-LS3-2 Make and defend a claim based on evidence that inheritable genetic variations may result from (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

Science and Engineering Practices

Engaging in Argument from Evidence. Make and defend a claim based on evidence about the natural world that reflects scientific knowledge, and student-generated evidence.

Disciplinary Core Ideas

LS3.B: Variation of Traits

In sexual reproduction, chromosomes can sometimes swap sections during the process of meiosis (cell division), thereby creating new genetic combinations and thus more genetic variation. Although DNA replication is tightly regulated and remarkably accurate, errors do occur and result in mutations, which are also a source of genetic variation. Environmental factors can also cause mutations in genes, and viable mutations are inherited.

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

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

HS-ESS3-1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

Science and Engineering Practices

Asking Questions and Defining Problems. Ask questions that arise from examining models or a theory to clarify relationships.

Disciplinary Core Ideas

LS3.A: Inheritance of Traits

Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA. The instructions for forming species' characteristics are carried in DNA. All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways.

Not all DNA codes for a protein; some segments of DNA are involved in regulatory or structural functions, and some have no as-yet known function.

Standards Addressed (Cont.):

Next Generation Science Standards (Cont.)

HS-ESS3-5 Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems.

Science and Engineering Practices

Analyzing and Interpreting Data. Analyze data using computational models in order to make valid and reliable scientific claims.

Disciplinary Core Ideas

ESS3.D: Global Climate Change. Though the magnitudes of human impacts are greater than they have ever been, so too are human abilities to model, predict, and manage current and future impacts.

Crosscutting Concepts

Stability and Change. Change and rates of change can be quantified and modeled over very short or very long periods of time. Some system changes are irreversible.

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.

Possible Standards Include:

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

B.12.F Describe how environmental change can impact ecosystem stability.