



5-E CLASSROOM STEM ACTIVITY:
HEARING BOTH SIDES

By Dr. Alexandra Owens

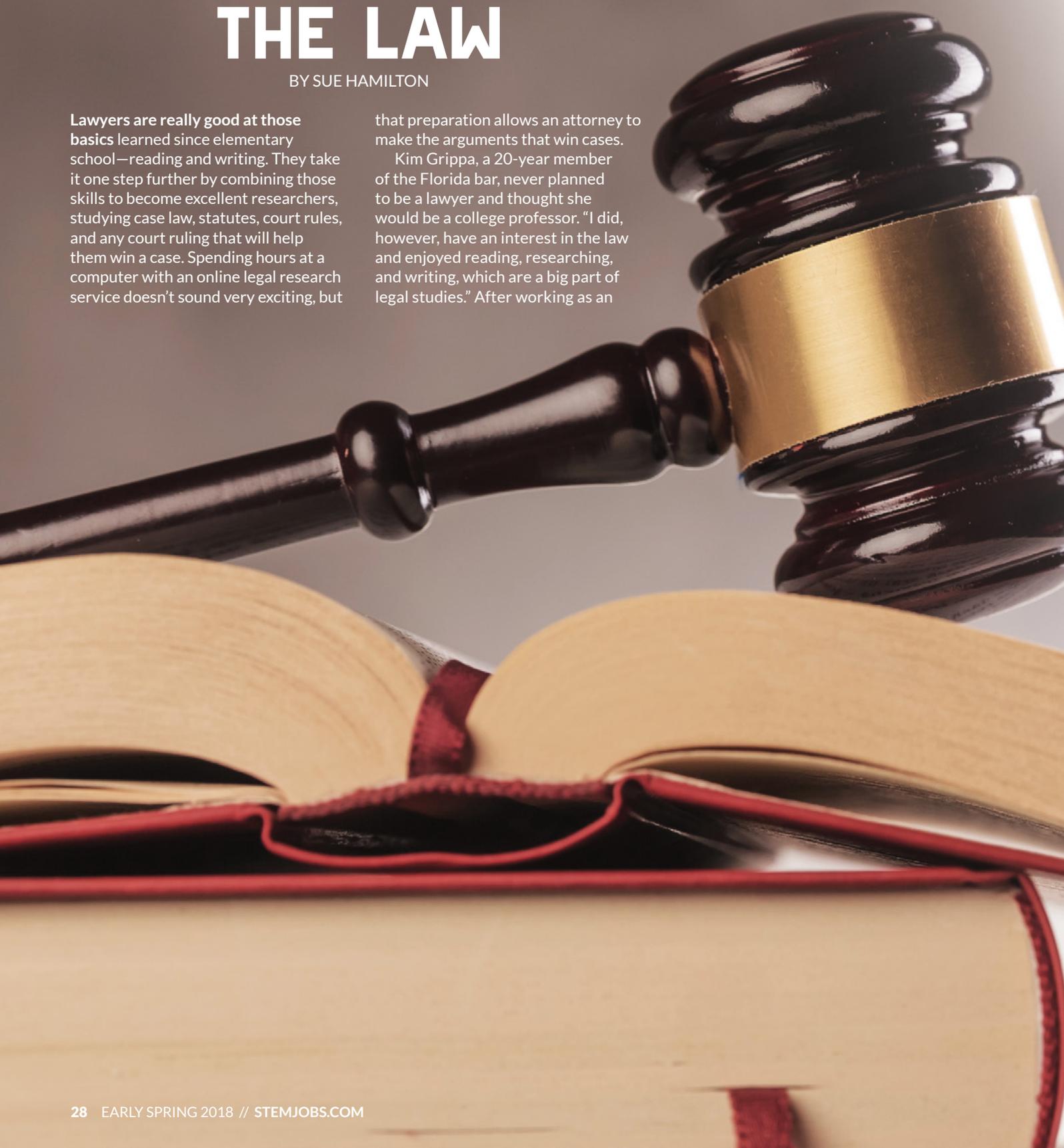
TEACHING THE LAW

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!”

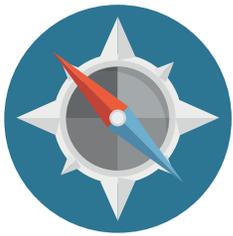
5-E CLASSROOM STEM ACTIVITY: TREATING THE TEAM

Here are some ideas for how middle 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 skills 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.6-8.1 Cite specific textual evidence to support analysis of science and technical texts.

CCSS.ELA-LITERACY.RST.6-8.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

CCSS.ELA-LITERACY.RST.6-8.8 Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

CCSS.ELA-LITERACY.RI.6.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

CCSS.ELA-LITERACY.RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.

CCSS.ELA-LITERACY.SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.6.1.A Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

CCSS.ELA-LITERACY.SL.6.1.B Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.

CCSS.ELA-LITERACY.SL.6.1.C Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.

CCSS.ELA-LITERACY.SL.6.1.D Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing.

CCSS.ELA-LITERACY.SL.6.2 Interpret information presented in diverse media and formats

(e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

CCSS.ELA-LITERACY.SL.6.3 Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.

CCSS.ELA-LITERACY.SL.6.4 Present claims and findings, sequencing ideas logically and using pertinent descriptions,

facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-LITERACY.RI.7.1 Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

CCSS.ELA-LITERACY.RI.7.8 Trace and evaluate the argument and specific claims in a text,

assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.

CCSS.ELA-LITERACY.RI.7.9 Analyze how two or more authors writing about the same topic shape their presentations of key information by emphasizing different evidence or advancing different interpretations of facts.

CCSS.ELA-LITERACY.SL.7.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.7.1.A Come to discussions prepared, having read or researched material under study;

explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

CCSS.ELA-LITERACY.SL.7.1.B Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.

CCSS.ELA-LITERACY.SL.7.1.C Pose questions that elicit elaboration and respond to others' questions

and comments with relevant observations and ideas that bring the discussion back on topic as needed.

CCSS.ELA-LITERACY.SL.7.1.D Acknowledge new information expressed by others and, when warranted, modify their own views.

CCSS.ELA-LITERACY.SL.7.2 Analyze the main ideas and supporting details presented in diverse media and formats

(e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.

CCSS.ELA-LITERACY.SL.7.3 Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence.

CCSS.ELA-LITERACY.SL.7.4 Present claims and findings, emphasizing salient points in a focused, coherent manner

with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-LITERACY.RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.

CCSS.ELA-LITERACY.RI.8.6 Determine an author's point of view or purpose in a text and analyze

how the author acknowledges and responds to conflicting evidence or viewpoints.

CCSS.ELA-LITERACY.RI.8.8 Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

CCSS.ELA-LITERACY.RI.8.9 Analyze a case in which two or more texts provide conflicting information

on the same topic and identify where the texts disagree on matters of fact or interpretation.

CCSS.ELA-LITERACY.SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.8.1.A Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

CCSS.ELA-LITERACY.SL.8.1.B Follow rules for collegial discussions and decision-making,

track progress toward specific goals and deadlines, and define individual roles as needed.

CCSS.ELA-LITERACY.SL.8.1.C Pose questions that connect the ideas of several speakers

and respond to others' questions and comments with relevant evidence, observations, and ideas.

CCSS.ELA-LITERACY.SL.8.1.D Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.

CCSS.ELA-LITERACY.SL.8.2 Analyze the purpose of information presented in diverse media and formats

(e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

CCSS.ELA-LITERACY.SL.8.3 Delineate a speaker's argument and specific claims, evaluating the soundness of the

reasoning and relevance and sufficiency of the evidence and identifying when irrelevant evidence is introduced.

CCSS.ELA-LITERACY.SL.8.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant

evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

Standards Addressed (Cont.):

Next Generation Science Standards

Possible Standards Include:

MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

Science and Engineering Practices

Constructing Explanations and Designing Solutions. Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Disciplinary Core Ideas

LS1.B: Growth and Development of Organisms

Genetic factors as well as local conditions affect the growth of the adult plant.

Crosscutting Concepts

Cause and Effect. Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.

MS-LS4-5. Gather and synthesize information about technologies that have changed the way humans influence the inheritance of desired traits in organisms.

Science and Engineering Practices

Obtaining, Evaluating, and Communicating Information. Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence.

Disciplinary Core Ideas

LS4.B: Natural Selection

In artificial selection, humans have the capacity to influence certain characteristics of organisms by selective breeding.

One can choose desired parental traits determined by genes, which are then passed on to offspring.

Crosscutting Concepts

Cause and Effect. Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.

Interdependence of Science, Engineering, and Technology. Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems.

Science Addresses Questions About the Natural and Material World. Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes.

MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

Science and Engineering Practices

Constructing Explanations and Designing Solutions. Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Disciplinary Core Ideas

ESS3.A: Natural Resources

Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes.

Crosscutting Concepts

Cause and Effect. Cause and effect relationships may be used to predict phenomena in natural or designed systems.

MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

Science and Engineering Practices

Asking Questions and Defining Problems. Ask questions to identify and clarify evidence of an argument.

Disciplinary Core Ideas

ESS3.D: Global Climate Change

Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities.

Crosscutting Concepts

Stability and Change. Stability might be disturbed either by sudden events or gradual changes that accumulate over time.

MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Science and Engineering Practices

Engaging in Argument from Evidence. Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.

Disciplinary Core Ideas

ESS3.C: Human Impacts on Earth Systems

Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.

Crosscutting Concepts

Cause and Effect. Cause and effect relationships may be used to predict phenomena in natural or designed systems.

Influence of Science, Engineering, and Technology on Society and the Natural World. All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment.

Science Addresses Questions About the Natural and Material World. Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes.

Standards Addressed (Cont.):

Texas Essential Knowledge and Skills - Math

6-8.1.A apply mathematics to problems arising in everyday life, society, and the workplace.

6-8.1.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.

6-8.1.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

6-8.2.E analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends

6-8.3.A in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student

Possible Standards Include:

6.7.A research and debate the advantages and disadvantages of using coal, oil, natural gas, nuclear power, biomass, wind, hydropower, geothermal, and solar resources

6.11.C describe the history and future of space exploration, including the types of equipment and transportation needed for space travel

7.11.C identify some changes in genetic traits that have occurred over several generations through natural selection

and selective breeding such as the Galapagos Medium Ground Finch (*Geospiza fortis*) or domestic animals

7.14.B compare the results of uniform or diverse offspring from sexual reproduction or asexual reproduction

8.8.E research how scientific data are used as evidence to develop scientific theories to describe the origin of the universe