Proficiences Needed to be Successful in STEM:

Math:

Modeling
- Use numerical phenomena or quantities to a model mathematics to a situation.
- Use geometric shapes and their properties to model physical objects.
- Use equations, inequalities and functions to model and interpret situations.
- Use statistics to model situations involving data. (HSS)
- Interpret the results of applying the model in the context of the situation.

Number and Quantity
- Reason quantitatively and use units to solve problems.

Algebra
- Interpret the structure of expressions.
- Write expressions in equivalent forms to solve problems.
- Perform arithmetic operations on polynomials.
- Use polynomial identities to solve problems.
- Rewrite rational expressions.
- Create equations that describe numbers or relationships.
- Understand solving equations as a process of reasoning and explain the reasoning.
- Solve systems of equations.
- Represent and solve equations and inequalities graphically.

Functions
- Understand the concept of a function and use function notation.
- Interpret functions that arise in applications in terms of the context.
- Analyze functions using different representations.
- Build a function that models a relationship between two quantities.
- Build new functions from existing functions.

Geometry
- Experiment with transformations in the plane.
- Understand congruence in terms of rigid motions.
- Understand similarity in terms of similarity transformations.
- Prove theorems involving similarity.
- Define trigonometric ratios and solve problems involving right triangles.
- Understand and apply theorems about circles.
- Explain volume formulas and use them to solve problems.
- Visualize relationships between two-dimensional and three-dimensional objects
- Apply geometric concepts in modeling situations.

Statistics & Probability
- Develop understanding of statistical variability.
- Summarize and describe distributions.
- Use random sampling to draw inferences about a population.
- Draw informal comparative inferences about two populations.
- Investigate chance processes and develop, use, and evaluate probability models.

English Language Arts:

Reading
- Determine the central ideas of the text and provide an objective summary.
- Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.
- Evaluate content and multiple sources of information presented in diverse media and formats (e.g., print, digital, visual, quantitative) to address a question or solve a problem.
- Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.
- Integrate information from diverse sources into a coherent understanding of an idea or event, noting discrepancies among sources.

English Language Arts (cont'd):

Writing
- Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
- Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
- Use technology to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
- Collect relevant information from multiple print and digital sources, using effective research and online search methods, and determine the credibility and accuracy of the sources while assessing the strengths and limitations of each source for the specific task, purpose, and audience.
- Integrate information into the text selectively and purposefully to maintain the flow of ideas, while following a standard citation format and avoiding plagiarism and overreliance on any one source.
- Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking and Listening
- Refer to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.
- Operate effectively in a group to promote a civil exchange of ideas that probes reasoning and evidence, ensuring a full range of positions on a topic or issue; set clear goals and deadlines and establish individual roles as needed; clarify, verify, or challenge ideas and conclusions; promote divergent and creative perspectives.
- Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.
- Integrate multiple sources of information presented in diverse formats and media to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.
- Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, connections among ideas, word choice, points of emphasis, and tone used.
- Develop a clear line of reasoning.
- Address alternative or opposing perspectives.
- Use appropriate organization, development, style, and substance appropriate to a range of purposes and audiences for both formal and informal tasks.
- Make strategic use of digital media in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
- Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.

Language
- Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- Determine or clarify the meaning of unknown and multiple-meaning words and phrases, choosing flexibly from a range of strategies.
- Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking and listening at the college and career-readiness level.
- Demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.