

# FAYETTE COUNTY PUBLIC SCHOOLS

## Unit Framework for STEM – Intermediate

Unit 1	Skyscrapers		
<p><b>Big Ideas</b> What enduring understandings are essential for application to new situations within or beyond this content?</p>	<p>Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. The human world around us is built upon the engineering design process. Every man-made structure first began as an idea or a solution to a problem. It is crucial to understand the importance of generating and comparing multiple possible solutions to a problem based on criteria and restraints. In an ever growing world, space and land are becoming less available. Innovation and outside the box thinking are crucial to today’s workforce.</p> <p>Students will use real-world examples of skyscrapers that were constructed in a limited space of land in order to design their own building. As students work through each part, they will gain insight into important elements of structural design. This new knowledge and authentic inspiration will lead to them engaging in the engineering design process to construct their own free-standing tower using restraints and criterion.</p>		
<p><b>Essential Questions</b> What questions will provoke and sustain student engagement while focusing learning?</p>	<p>What shapes do you see in famous skyscrapers? Do you notice patterns in the construction of each building? Why do many skyscrapers follow a similar design? How can you build a tall, free-standing tower with only 4 index cards? How can you build a strong, free-standing tower with only 4 index cards? Which 3 Dimensional shapes hold the most weight? Why must a skyscraper have a strong base?</p>		
<p><b>Power Standards</b> Which standards provide endurance beyond the course, leverage across multiple disciplines, and readiness for the next level?</p>	<p>3-5-ETS1-1 Engineering Design: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. 3-5-ETS1-2 Engineering Design Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem 3-5-ETS1-3 Engineering Design Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</p>		
<p><b>Supporting Standards</b> Which related standards will be incorporated to support and enhance the enduring standards?</p>	<p>CCSS.Math.Content.1.G.A.2 ISTE 1d, 3d, 4abcd KAS Technology Standards: 1.16, 3.3, 5.1, 5.2, 6.3</p>		
<p><b>Essential Vocabulary</b> What vocabulary must students know to understand and communicate effectively about this content?</p>	<p>Structure Base Cylinder Rectangular Prism</p>	<p>Triangular Prism Architecture Exterior Flexible</p>	<p>Design Spire Story Rivet</p>

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<p><b><u>Cross Curriculum Connections</u></b> Are there opportunities to make connections to other disciplines (standards and curriculum programs)?</p>	<p>ELA- Writing W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.</p> <p>Mathematics - MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. 3-5.OA Operations and Algebraic Thinking</p> <p>Crosscutting Concepts: Influence of Science, Engineering, and Technology on Society and Natural World Patterns</p>
<p><b><u>Assessing Learning</u></b> How will you know when students have learned? How do you know students have successfully met the learning intention?</p>	<p><a href="#">Rubric for Skyscraper</a></p> <p><a href="#">Flipgrid Response</a></p>
<p><b><u>Instructional Strategies and Other Resources</u></b></p>	<p><a href="#">Teacher Overview</a></p> <p><a href="#">Skyscraper Google Slides Notebook</a></p> <p>The following links appear in the Google Slides Notebook: (You do not need to have anything but the Slides Notebook)</p> <ul style="list-style-type: none"> <li>• <a href="#">Read the Story</a> or <a href="#">Read Aloud</a></li> <li>• <a href="#">Skyscraper Research Drawing</a></li> <li>• <a href="#">Google Earth Project</a></li> </ul>
<p><b>**Each Unit Framework guides planning and delivery of instruction. An Instructional Planning Companion tool to guide instructional planning (Unit/Lesson Plans) can be found on the <b>Curriculum Platform</b>.</b></p>	