

YEAR AT A GLANCE: 8th Grade Technology/PLTW

(updated Dec 2022)

	<u>UNIT 1</u>	<u>UNIT 2</u>	<u>UNIT 3</u>	<u>UNIT 4</u>	<u>UNIT 5</u>
Title	Bridges	Rockets	Design Process		
Unit Length <i>(weeks taught)</i>	3 weeks	3 weeks	4 weeks		
Performance Task <i>(e.g., Persuasive Essay, DBQ, Nutritional Analysis, etc.)</i>	Students will understand the forces that allow bridges to stand up. They will design a bridge on a computer simulated program	Students will understand how Newton's Laws of Motion affect rockets and allow them to operate. Students will design and build a model rocket to prove Newton's Laws of Motion	Explain the relationship between science, technology, engineering and math. Describe engineering and explain how engineers participate in or contribute to the invention and innovation of products. Describe impacts that technology has had on society. Distinguish between invention and innovation. Students will create a foot orthosis using the design process to inform their decision making? Assemble an engineering notebook		

			and a portfolio.		
<p>Enduring Understanding (The big ideas, the “why” we include these ideas)</p>	<p>Students will learn how bridges work and what allows them to stand up. They will also learn why they fail.</p>	<p>If we continue to meet our energy needs with fossil fuels, what might be different about the way we live in 2030 and why? Students will also learn the history of rockets and why they are so important for technology and science.</p>	<p>Science is the study of the natural world, while technology is the study of how humans develop new products to meet needs and wants.</p> <p>Teams of people can accomplish more than one individual working alone.</p> <p>Technological change is seen through inventions, innovations, and the evolution of technological artifacts, processes, and systems.</p>		
<p>Essential Questions (What do we want students to think about)</p>	<p>What is compression and tension on a bridge structure? What is a truss? How do bridges stand up? What are the different types of loads applied to a bridge?</p>	<p>What are Newton’s Three Laws of Motion and how do they apply to the Model rockets? How will you engineer and build your model rocket to ensure that it is aerodynamic? What Law of Motion is responsible for the excessive speed that the model rockets attain? How can you reduce surface friction and fluid friction to increase speed?</p>	<p>How are our lives impacted by engineers? What is the difference between an invention and innovation? How does the use of technology affect the way that you live? How is a design process used to effectively develop a design solution that solves a problem or addresses a design</p>		

opportunity?

Why is it important for an engineer to be aware of the criteria and the constraints when designing a project?

How can mathematical modeling help designers understand a design?

How is design testing data used to improve design?
Why is brainstorming, research, and testing important when creating, modifying, or improving a design solution?