

**New Paltz Central School District  
Technology  
Eighth Grade**

Time	Essential Questions/Content	Standards/Skills	Assessments
September – October	<p><b><u>Unit 1: Introduction to Technology</u></b></p> <ul style="list-style-type: none"> <li>• What is the design process and how is it used?</li> <li>• Why do people work in teams when solving design problems?</li> <li>• What is meant by constraints and criteria?</li> <li>• Why are design elements considered when engineers and designers invent or innovate a product?</li> <li>• What is the purpose of a portfolio for a student? for an engineer?</li> </ul> <p>-----</p> <ul style="list-style-type: none"> <li>• Engineering notebooks</li> <li>• Design process review</li> <li>• Measurement review</li> <li>• Safety review</li> <li>• Constraints</li> <li>• Crane challenge</li> </ul>	<ul style="list-style-type: none"> <li>• Proficiently use and understand measurement, safety regulations, and the design process</li> <li>• Understand constraints and their significance</li> </ul>	<ul style="list-style-type: none"> <li>• Measurement quiz</li> <li>• Safety quiz</li> <li>• Crane challenge/rubric (the challenge tests students’ abilities to design, measure, and build within a set of constraints)</li> <li>• Notebook check</li> </ul>
October – November	<p><b><u>Unit 2: Energy Technology</u></b></p> <ul style="list-style-type: none"> <li>• What is solar energy? What are the types of solar energy?</li> <li>• How are solar homes planned?</li> <li>• How are solar homes designed?</li> <li>• What is “green” building?</li> </ul> <p>-----</p> <ul style="list-style-type: none"> <li>• Research and constraints</li> <li>• Passive and active solar</li> <li>• Energy conservation</li> <li>• Green building</li> <li>• Plot planning</li> <li>• Floor planning</li> <li>• Elevations</li> <li>• Solar orientation</li> <li>• Insulation</li> </ul>	<ul style="list-style-type: none"> <li>• Examine the types of energy production</li> <li>• Distinguish from renewable and non-renewable sources</li> <li>• Design a building within a set of constraints</li> <li>• Draw and design: plot, floor plans, and elevation drawings</li> </ul>	<ul style="list-style-type: none"> <li>• Energy source</li> <li>• Quiz</li> <li>• Rubric grading on plot, floor, and elevation planning</li> <li>• Constraint rubric</li> <li>• Passive solar rubric</li> </ul>

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<p><b>November – December</b></p>	<p><b><u>Unit 3: Solar Home Construction</u></b></p> <ul style="list-style-type: none"> <li>• What is passive solar heating?</li> <li>• What is efficiency?</li> <li>• How does passive solar heating work in the winter/summer?</li> </ul> <p>-----</p> <ul style="list-style-type: none"> <li>• Characteristics of good passive solar design</li> <li>• Floor planning</li> <li>• Elevation</li> <li>• Characteristics of heat retention</li> <li>• Efficiency</li> </ul>	<p>Literacy</p> <ul style="list-style-type: none"> <li>• Read closely to determine what the text says explicitly and to make logical inferences for it: cite specific textual evidence when writing or speaking to support conclusions drawn from the text.</li> <li>• Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning and tone.</li> <li>• Assess how point of view or purpose shapes the content and style of the text.</li> <li>• Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.</li> <li>• Write informative/exploratory texts to examine and convey complex ideas and information clearly and accurately through effective selection, organization, and analysis of content.</li> <li>• Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</li> <li>• Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.</li> <li>• Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.</li> </ul> <p>Math</p> <ul style="list-style-type: none"> <li>• Perform operations with numbers expressed in scientific notation, including problems where both decimals and scientific notation are used. Interpret scientific notation that has been generated by technology.</li> <li>• Use informal arguments to establish facts about the angle</li> </ul>	<ul style="list-style-type: none"> <li>• Construction rubric</li> <li>• Efficiency testing</li> <li>• Notebook grade</li> </ul>

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		<ul style="list-style-type: none"> <li>• sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.</li> <li>• Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two or three dimensions.</li> </ul>	<ul style="list-style-type: none"> <li>• Passive solar research report</li> <li>• House construction</li> <li>• House efficiency testing</li> <li>• Review of house data/self-reflective report on solar home and improvements</li> </ul>
<p><b>January - February</b></p>	<p><b><u>Unit 4: Structural Engineering - Bridge Design</u></b></p> <ul style="list-style-type: none"> <li>• What are the types of bridges?</li> <li>• What is material efficiency?</li> <li>• What are bridge constraints?</li> <li>• What are material constraints?</li> <li>• How are bridge plans created?</li> </ul> <p>-----</p> <ul style="list-style-type: none"> <li>• Introduction to bridge building</li> <li>• Types of bridges</li> <li>• Size constraints</li> <li>• Material constraints</li> <li>• Structural efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Identify the different types of bridges</li> <li>• Understand basic constraints: size, material, and efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Bridge design brief</li> <li>• Bridge sketch</li> <li>• Bridge final plans</li> <li>• Notebook check</li> </ul>

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<b>March - April</b>	<p><b><u>Unit 5: Structural Engineering: Bridge Construction</u></b></p> <ul style="list-style-type: none"> <li>• How do I create templates?</li> <li>• How do I select the proper wood and adhesive?</li> <li>• What is my construction method?</li> <li>• How does destructive testing work and what does it tell me?</li> </ul> <p>-----</p> <ul style="list-style-type: none"> <li>• Selection of wood and its strengths and weaknesses</li> <li>• Adhesive selection</li> <li>• Destructive testing</li> </ul>	<ul style="list-style-type: none"> <li>• Determine best wood and adhesive</li> <li>• Construct and assemble bridge</li> <li>• Understand bridge efficiency through destructive testing</li> </ul>	<ul style="list-style-type: none"> <li>• Bridge component construction</li> <li>• Bridge final assembly</li> <li>• Efficiency testing</li> <li>• Notebook grade</li> </ul>
<b>April - June</b>	<p><b><u>Unit 6: Flight and Space</u></b></p> <ul style="list-style-type: none"> <li>• What makes an airplane fly?</li> <li>• What engineering careers are specific to the aerospace industry?</li> <li>• Why are different flight vehicles designed differently?</li> <li>• What technological advancements led to the advancement of flight?</li> <li>• What is the difference between airplane flight and space flight?</li> <li>• What is a propulsion system and how is it used to move an aircraft and a spacecraft?</li> <li>• How do the forces of lift, drag, gravity, and thrust affect the flight of an airplane?</li> <li>• How does the shape of a wing affect how much lift it generates?</li> </ul> <p>-----</p>	<ul style="list-style-type: none"> <li>• Understand the different components of aerospace technology</li> <li>• Identify careers in aerospace engineering</li> <li>• Understand the forces that effect flight</li> <li>• Understand and apply Newton's laws</li> <li>• Understand Bernoulli's Principle</li> <li>• Identify the parts of an aircraft and how they control flight</li> <li>• Identify different propulsion systems and how they work and apply Newton's laws</li> </ul>	<ul style="list-style-type: none"> <li>• Flying machine and presentation</li> <li>• Aerospace infomercial</li> <li>• Forces of flight worksheet</li> <li>• Newton's Laws labs</li> <li>• Wind tunnel testing</li> <li>• Foilism-airfoil design lab</li> <li>• Glider project</li> <li>• Notebook evaluation</li> </ul>

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	<ul style="list-style-type: none"><li>• Introduce to aerospace technology</li><li>• Aerospace technology careers</li><li>• Newton's Laws of Motion</li><li>• Airfoils lift and Bernoulli's Principle</li><li>• Aeronautics (airfoil wind tunnel test)</li><li>• Foilism</li><li>• Aircraft parts and their uses</li><li>• Propulsion systems</li></ul>		