

# PITTSGROVE TOWNSHIP SCHOOL DISTRICT

<b>Course Name: Green Architecture</b>	<b>Grade Level(s): 6</b>
<b>Department: STEM</b>	<b>Credits:</b>
<b>BOE Adoption Date: September 17, 2020</b>	<b>Revision Date(s):</b>

## Course Description

Today's students have grown up in an age of "green" choices. In Green Architecture (GA) students learn how to apply this concept to the fields of architecture and construction by exploring dimensioning, measuring, and architectural sustainability as they design affordable housing units using floorplanner.com architectural design software.

Architecture is the art and science of designing buildings. The basics of architectural design usually address feasibility and cost, as well as function and aesthetics. Students learn how to use an architectural scale to accurately measure drawings and read architectural plans. They will learn about planning residential spaces, the different systems in a home and how to read the symbols found in architectural plans.

Sustainable architecture is a general term that describes environmentally conscious design techniques in the field of architecture. Sustainable architecture seeks to minimize the negative environmental impact of buildings by enhancing efficiency and moderation in

the use of materials, energy, and development space. The goal of sustainability is to ensure that our actions and decisions today do not inhibit the opportunities of future generations.

More efficient building design will be one of the biggest sources of energy savings in the near future. Many developers are seeking Leadership in Energy and Environmental Design (LEED) certification for new projects to signify their commitment to energy conservation and sustainable building design. Global citizens need to be aware of the global challenges of resource depletion and environmental degradation resulting from development and the positive effects of sustainable architecture.

Floorplanner.com building design software works the way that architects and designers think, which allows the user to develop high-quality, accurate architectural designs. It allows the user to design with both parametric 3D modeling and 2D drafting elements. It helps capture and analyze concepts and maintain vision through design, documentation, and construction. BIM is a computer-aided design (CAD) paradigm that employs intelligent 3D objects to represent real physical building components such as windows, doors, furniture, and appliances. Therefore, students can make more informed decisions with information-rich models to support sustainable design, construction planning, and fabrication. Students will learn how to use the floorplanner software to design a sustainable home using shipping containers. The final project will be to build a wall with a door or window out of balsa wood

### **Mission Statement**

***The Pittsgrove Township School District believes in growing all learners to thrive. The district offers an intellectually rigorous, dynamic curriculum aligned to state and national standards coupled with research-based practices in classrooms. The Pittsgrove Township School District strives to highlight critical thinking, problem-solving, intercultural literacy, digital literacy, collaboration, innovation, and a growth mindset as part of the instructional core of learning. The district provides high quality resources to provide young people the knowledge they need to approach the future as leaders and learners.***

### **Curriculum & Instruction Goals**

1. To ensure students are college and career ready upon graduation
2. To vertically and horizontally align curriculum PreK-12 to ensure successful transition of students at each grade level
3. To identify individual student strengths and weaknesses utilizing various assessment measures (formative, summative, alternative, etc.) so as to differentiate instruction while meeting the rigor of the applicable content standards
4. To improve student achievement as assessed through multiple measures including, but not limited to, state testing, local assessments, and ongoing progress monitoring

### **How to Read this Document**

This curricular document contains both a  *pacing guide*  and  *curriculum units* . The  *pacing guide*  serves to communicate an estimated timeframe as to  *when*  critical knowledge and skills will be taught throughout the year. The  *pacing* , however, may differ slightly depending upon the unique needs of each learner. The  *curriculum units*  contain more detailed information as to the content, goals, objectives, instructional strategies, resources, and assessments.

NJ Administrative Code and Statutes Key
^=Amistad Law
O=Diversity & Inclusion Law
<>=Holocaust
+=LGBT and Disabilities Law
*=AAPI (Asian American and Pacific Islanders)
§=Financial Literacy
Use this key to understand where the NJ mandates are being implemented in the K-12 curriculum units.

**Pacing Guide**

**Course Title: Green Architecture**

**Prerequisite(s):**

Unit Title	Duration/ Month(s)	Related Standards	Learning Goals	Critical Knowledge and Skills
<b>Unit 1: Architectural Basics</b>	<b>10 days</b>	MS-ETS1-1  MS-ETS1-2  9.4.8.GCA.2  G.GPE.B.7  G.MG.A.2	<ol style="list-style-type: none"> <li><b>1. The ability to measure accurately is important at school and at home, at work, and when pursuing hobbies.</b></li> <li><b>2. Precision measuring tools are needed for accuracy, but tools must be used correctly to ensure that accurate measurements are taken.</b></li> <li><b>3. Quality of workmanship and accurate measurements with precise instruments are necessary to successfully solve problems.</b></li> <li><b>4. The use of scale is important in design in order to create a</b></li> </ol>	<ul style="list-style-type: none"> <li>● Discuss and write daily vocabulary</li> <li>● Create the most accurate AND artistic “blue”print of our classroom Constraint: Teams may not move the ruler provided. <u>Blueprint Challenge</u></li> <li>● Determine the measurements as per PLTW pages 1-5</li> <li>● Take notes and discuss ticks on standard ruler: halves, fourths, eighths, sixteenths</li> <li>● Play online ruler games <u>ruler game</u> and <u>Sub Game</u></li> <li>● Review area and perimeter with online site <u>Review</u></li> <li>● Complete PLTW p. 6-9</li> <li>● Calculate inches into</li> </ul>

			<p><b>functional space that is proportional and aesthetically pleasing to the client.</b></p> <ol style="list-style-type: none"><li><b>5. Dimensioning and measuring are required for any architectural project as well as many careers in related fields.</b></li><li><b>6. Area and perimeter are used to find the square footage of a floor, a wall, or the length and width needed to build the exterior of a home.</b></li><li><b>7. When designing a home, standard rules must be followed in regards to traffic flow, room sizes and relationships, and the layout of kitchens and bathrooms.</b></li><li><b>8. A set of architectural plans includes: plot plan, foundation plan, floor plan, elevations, 3D views, and construction details.</b></li></ol>	<p>decimals for proper calculation of area</p> <ul style="list-style-type: none"><li>● Calculate area and perimeter of classroom using measuring tape</li><li>● Draw blueprint of classroom</li><li>● Measure using an architectural ruler and use templates</li><li>● Self and peer evaluate</li></ul>
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<b>Unit 2: Sustainability</b>	<b>10 days</b>	8.2.8.ITH.3:  8.2.8.ITH.4:  8.2.8.ETW.1:  8.2.8.ETW.2:  9.4.8.IML.12:  9.4.8.IML.13:  RL.6.4  RI.6.7.  NJLSA.W7.  NJLSA.W8.	<ol style="list-style-type: none"> <li><b>1. Sustainable building solutions are an important part of the world today as our resources are dwindling.</b></li> <li><b>2. Many different processes are used to recycle a variety of materials.</b></li> <li><b>3. Researching various recycling processes helps one better understand the requirements and the complexity of recycling processes.</b></li> <li><b>4. The air we breathe inside a room can contain contaminants and particles, making it potentially dangerous for humans.</b></li> <li><b>5. The health consequences of poor indoor air quality include coughs, colds, cancer, and even death.</b></li> <li><b>6. Building green refers to</b></li> </ol>	<ul style="list-style-type: none"> <li>● Discuss and write daily vocabulary</li> <li>● View Documentary 88 days from Ground to Green</li> <li>● Discuss and answer questions on documentary on google form</li> <li>● Create Google slideshow of LEED architectural building <u><a href="#">LEED project</a></u></li> <li>● Learn and demonstrate a variety of technology on google slides LEED project such as change shape of an image, adding border and color to images, changing backgrounds, adding word art, adding gifs, using sites like cooltext.com</li> <li>● Determine Leed status, Green elements</li> <li>● View a variety of LEED building videos on edpuzzle</li> <li>● Understand and explain chasing arrows</li> <li>● Understand the difference between a slogan and a logo</li> <li>● Find sustainable products to</li> </ul>

			<p>methods of fabricating both commercial and residential structures to reduce their impact on human health and the natural environment.</p> <p>7. Architectural designs are created based on the needs of humans and the function of the building in relationship to the climate, region, and culture.</p> <p>8. Within a local community, a variety of construction materials and architectural styles are used according to purpose.</p> <p>9. Architects, engineers, designers, and engineering technologists are in high demand for the development of future technology to meet societal needs and wants.</p>	<p>buy online notating both logo and slogan</p>
<p><b>Unit 3:</b> <b>Floorplanning.com</b></p>	<p><b>20 days</b></p>	<p>MS-ETS1-1</p> <p>MS-ETS1-2</p>	<p>1. The ability to measure precisely and accurately is important at school and at home, at work, and when pursuing</p>	<ul style="list-style-type: none"> <li>● Discuss and write daily vocabulary</li> <li>● Recreate a Room Project: Draw blueprints with</li> </ul>

		<p>9.4.8.CI.2: .</p> <p>9.4.8.IML.3:</p> <p>RI.6.7</p>	<p><b>hobbies.</b></p> <ol style="list-style-type: none"> <li><b>2. Numerous symbols are part of architectural plans. It is important to be able to identify such symbols..</b></li> <li><b>3. Using graph paper and an architectural scale can help in the visualization of a space before the start of the prototype phase.</b></li> <li><b>4. Architecture today uses computer-aided design (CAD) systems to quickly generate and annotate working drawings.</b></li> <li><b>5. Three-dimensional computer modeling uses descriptive geometry, geometric relationships, and dimensions to communicate an idea or solution to a technological problem.</b></li> <li><b>6. Using alternative materials in construction is beneficial to our environment.</b></li> <li><b>7. Architecture and construction emphasize using environmentally</b></li> </ol>	<p>dimensions and use templates for scale drawing of 1/4 =1 inch <u>Architectural Blueprint</u></p> <ul style="list-style-type: none"> <li>● Move blueprint plans to floorplanner.com</li> <li>● <u>Shipping Container Project</u></li> <li>● Create a blueprint using an architectural rule and follow the criteria and constraints</li> <li>● Recreate blueprint plans on floorplanner program</li> <li>● Present final project on flipgrid or google form</li> </ul>
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			<p>friendly practices in their career fields.</p> <p>8. Architects and engineers use the design process when designing and building structures.</p> <p>9. Creating a functional and environmentally friendly home is considered sustainable housing that could be adapted for emergency shelter in disaster areas</p>	
<p><b>Unit 4: Balsa Wood an Architectural Challenge</b></p>	<p><b>20 days</b></p>	<p>MS-ETS1-1</p> <p>MS-ETS1-2</p> <p>RI.6.7</p>	<p>1. The ability to measure precisely and accurately is important at school and at home, at work, and when pursuing hobbies.</p> <p>2. Numerous symbols are part of architectural plans. It is important to be able to identify such symbols.</p> <p>3. Wood frame construction is popular because it is economical and strong.</p> <p>4. Using graph paper and an architectural scale can help in the visualization of a space before the start of the prototype phase.</p>	<ul style="list-style-type: none"> <li>● Discuss and write daily vocabulary</li> <li>● Create blueprint for wall</li> <li>● Build balsa wood wall with door or window</li> <li>● Meet criteria and constraints <a href="#">part 1</a> <a href="#">part 2</a></li> </ul>

## Instructional Unit Map

**Course Title: Green Architecture**

<b>Unit Title</b>	Unit 1- Architectural Basics		<b>Start Date:</b>	Trimester
			<b>Length of Unit:</b>	10 days
<b>Content Standards</b> <i>What do we want them to know, understand, &amp; do?</i>	<p>MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.</p> <p>MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the</p>	<b>Learning Goals</b>	<ul style="list-style-type: none"> <li>-The ability to measure accurately is important at school and at home, at work, and when pursuing hobbies.</li> <li>-Precision measuring tools are needed for accuracy, but tools must be used correctly to ensure that accurate measurements are taken.</li> <li>-Quality of workmanship and accurate measurements with precise instruments are necessary to successfully solve problems.</li> <li>-The use of scale is important in design in order to create a functional space that is proportional and aesthetically pleasing to the client.</li> <li>-Dimensioning and measuring are required for any architectural project as well as many careers in related fields.</li> <li>-Area and perimeter are used to find the square footage of a floor, a wall, or the length and width needed to build the exterior of a home.</li> <li>-When designing a home, standard rules must be followed in regards to traffic flow, room sizes and relationships, and the layout of kitchens and bathrooms.</li> <li>-A set of architectural plans includes: plot plan, foundation plan, floor plan, elevations, 3D views, and construction details.</li> </ul>	

	<p>problem.</p> <p>9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.</p>			
<p><b>Essential Questions</b></p>	<ol style="list-style-type: none"> <li>1. <i>Why is knowledge of area and perimeter important when designing and constructing a building?</i></li> <li>2. <i>Describe a potential consequence if you do not pay attention to accuracy and precision when designing and constructing a building.</i></li> <li>3. <i>How do architects pay attention to both form and function when designing and constructing a building?</i></li> </ol>			
<p><b>Assessments</b> <i>How will we know they have gained the knowledge &amp; skills?</i></p>	<p style="text-align: center;"><b>Formative</b></p> <ul style="list-style-type: none"> <li>● Launch Log</li> <li>● Questioning</li> <li>● Observation</li> <li>● Worksheet inches into decimals</li> </ul>	<p style="text-align: center;"><b>Summative</b></p> <ul style="list-style-type: none"> <li>● Architectural Basics Quiz</li> <li>● Classroom blueprints</li> <li>● Architectural Ruler blueprint</li> <li>● Final test on Green Architecture given at end of course</li> </ul>		<p style="text-align: center;"><b>Alternative</b></p>

<b>Unit Pre-Assessment(s)</b> <i>What do they already know?</i>	Teacher generated introduction questions			
<b>Instructional Strategies/ Student Activities</b>	<ul style="list-style-type: none"> <li>● Discuss and write daily vocabulary</li> <li>● Create the most accurate AND artistic “blue”print of our classroom  <b>Constraint:</b>            Teams may not move the ruler provided.  <u>Blueprint Challenge</u></li> <li>● Determine the measurements as per PLTW pages 1-5</li> <li>● Take notes and discuss ticks on standard ruler:            halves, fourths, eighths, sixteenths</li> <li>● Play online ruler games <u>ruler game</u> and <u>Sub Game</u></li> <li>● Review area and perimeter with online site <u>Review</u></li> <li>● Complete PLTW p. 6-9</li> <li>● Calculate inches into decimals for proper calculation of area</li> <li>● Calculate area of classroom using measuring tape</li> <li>● Draw blueprint of classroom</li> <li>● Measure using an architectural ruler</li> <li>● Draw blueprints with dimensions and use templates for scale drawing of 1/4 =1 inch <u>Architectural Blueprint</u></li> <li>● Self and peer evaluate</li> </ul>			
<b>Instructional/Assessment</b>	<b>English Language Learners</b>	<b>Special Education Learners</b>	<b>Struggling Learners</b>	<b>Advanced Learners</b>

<p><b>Scaffolds</b> <i>(Modifications /Accommodations) – planned for prior to instruction</i></p>	<ul style="list-style-type: none"> <li>• Additional time</li> <li>• Flexibility in blueprint challenge</li> <li>• Allow redos/retakes</li> <li>• Read aloud quiz</li> <li>• Clarify quiz directions</li> <li>• Preview quiz procedures</li> <li>• Give one on one quiz</li> <li>• Provide a buddy</li> </ul>	<ul style="list-style-type: none"> <li>• Additional time</li> <li>• Flexibility in blueprint details</li> <li>• Allow redos/retakes</li> <li>• Read aloud</li> <li>• Clarify quiz directions</li> <li>• Preview quiz procedures</li> <li>• Flexible grouping</li> <li>• Guide to appropriate area of notebook during quiz</li> </ul>	<ul style="list-style-type: none"> <li>• Additional time</li> <li>• Flexibility in blueprint details</li> <li>• Read aloud</li> <li>• Clarify quiz directions</li> <li>• Allow for retakes</li> <li>• Flexible grouping</li> </ul>	<ul style="list-style-type: none"> <li>• Google classroom enrichment</li> <li>• Perimeter of classroom</li> <li>• Working with other accelerated learners</li> </ul>
<p><b>Differentiated Instructional Methods:</b> <i>(Multiple means for students to access content and multiple modes for student to express</i></p>	<p><b>Access</b> (Resources and/or Process)</p>		<p><b>Expression</b> (Products and/or Performance)</p>	
	<ul style="list-style-type: none"> <li>• Google Classroom</li> <li>• Sample blueprints</li> </ul>		<p>blueprints</p>	

<p><i>understanding)</i></p>		
<p><b>Vocabulary</b>  <i>Highlight key vocabulary (both Tier II and Tier III words)</i></p>	<p>Tier 2</p> <ul style="list-style-type: none"> <li>● Green architecture</li> <li>● Architect</li> <li>● Criteria</li> <li>● Constraints</li> <li>● Blueprint</li> <li>● Ruler</li> <li>● Yardstick</li> <li>● Measuring tape</li> <li>● Tick marks</li> <li>● Halves</li> <li>● Sixteenths</li> <li>● Eighths</li> <li>● Fourths</li> <li>● Area</li> <li>● Perimeter</li> <li>● Dimensions</li> <li>● Scaled up and down</li> <li>● Architectural ruler</li> <li>● templates</li> </ul>	
<p><b>Integration of Technology</b>  <u>SAMR</u></p>	<p>Substitution:          Use Google Classroom to take and review notes, concepts, and instructions</p> <p>Augmentative          Students watch review videos</p> <p>Modification:          Students work through interactive sites</p> <p>Redefined:</p>	

<b>Interdisciplinary Connections</b> <u>NJ Student Learning Standards</u>	<p><b>G.GPE.B.7</b> Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.* (modeling standard)</p> <p><b>G.MG.A.2</b> Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).* (modeling standard)</p>	
<b>21<sup>st</sup> Century Themes/Skills</b> <u>P21 Framework</u>	<p style="text-align: center;"><b>Themes</b></p>	<p style="text-align: center;"><b>Skills</b></p>
<b>Resources/Materials</b>	<ul style="list-style-type: none"> <li>● PLTW: Project Lead the Way site</li> <li>● Google classroom teacher created slides</li> <li>● Launch logs</li> <li>● Yard sticks</li> <li>● Rulers</li> <li>● Architectural rulers</li> <li>● Graph paper for blueprints</li> <li>● Colored pencils</li> <li>● Architectural templates</li> <li>● Videos</li> </ul>	
<ul style="list-style-type: none"> <li>● ENVIRONMENTAL LITERACY</li> </ul>	<ul style="list-style-type: none"> <li>● Flexibility and adaptability</li> <li>● Initiative and self direction</li> <li>● Leadership and responsibility</li> <li>● Creativity</li> <li>● Collaboration</li> <li>● Communication</li> <li>● Critical Thinking</li> <li>● Solve problems</li> <li>● Media Literacy</li> <li>● Manage projects</li> </ul>	

## Instructional Unit Map

**Course Title: Green Architecture**

<b>Unit Title</b>		Unit 2- Sustainability	<b>Start Date:</b>	Trimester
			<b>Length of Unit:</b>	10 days
<b>Content Standards</b> <i>What do we want them to know, understand, &amp; do?</i>		<ul style="list-style-type: none"> <li>• 8.2.8.ITH.3: Evaluate the impact of sustainability on the development of a designed product or system.</li> <li>• 8.2.8.ITH.4: Identify technologies that have been designed to reduce the negative consequences of other technologies and explain the change in impact.</li> <li>• 8.2.8.ETW.1: Illustrate how a</li> </ul>	<b>Learning Goals</b>	<ul style="list-style-type: none"> <li>-Sustainable building solutions are an important part of the world today as our resources are dwindling.</li> <li>-Many different processes are used to recycle a variety of materials.</li> <li>-Researching various recycling processes helps one better understand the requirements and the complexity of recycling processes.</li> <li>-The air we breathe inside a room can contain contaminants and particles, making it potentially dangerous for humans.</li> <li>-The health consequences of poor indoor air quality include coughs, colds, cancer, and even death.</li> <li>-Building green refers to methods of fabricating both commercial and residential structures to reduce their impact on human health and the natural environment.</li> <li>-Architectural designs are created based on the needs of humans and the function of the building in relationship to the climate, region, and culture.</li> <li>-Within a local community, a variety of construction materials and architectural styles are used according to purpose.</li> </ul>



		<p>product is upcycled into a new product and analyze the short- and long-term benefits and costs.</p> <ul style="list-style-type: none"><li>• 8.2.8.ETW.2: Analyze the impact of modifying resources in a product or system (e.g., materials, energy, information, time, tools, people, capital).</li></ul> <p>9.4.8.IML.12: Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.</p> <ul style="list-style-type: none"><li>• 9.4.8.IML.13: Identify the impact of the creator on the content, production, and delivery of</li></ul>		<p><b>-Architects, engineers, designers, and engineering technologists are in high demand for the development of future technology to meet societal needs and wants.</b></p>
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		information (e.g., 8.2.8.ED.1).		
<b>Essential Questions</b>		<p><i>Where do the products that you recycle end up?</i></p> <ol style="list-style-type: none"> <li>1. <i>How does the air you breathe every day affect your health?</i></li> <li>2. <i>What can you do to make the environment better for future generations?</i></li> <li>3. <i>How can you remodel a house to make it more "green"?</i></li> </ol>		
<b>Assessments</b> <i>How will we know they have gained the knowledge &amp; skills?</i>		<b>Formative</b>	<b>Summative</b>	<b>Alternative</b>
		<b>E</b> <ul style="list-style-type: none"> <li>● Launch Log</li> <li>● Questioning</li> <li>● Observation</li> <li>● Ground to Green Google assignment</li> <li>● Google SlideShow: Sustainable Products</li> </ul>	<ul style="list-style-type: none"> <li>● LEED Google Slide Project</li> <li>● Final test on Green Architecture given at end of course</li> <li>● Google slide show of sustainable products with slogans and/or logos</li> </ul>	
<b>Unit Pre-Assessment(s)</b> <i>What do they already know?</i>		Teacher generated introduction questions		

<b>Instructional Strategies/Student Activities</b>		<ul style="list-style-type: none"> <li>● Discuss and write daily vocabulary</li> <li>● View Documentary 88 days from Ground to Green</li> <li>● Discuss and answer questions on documentary</li> <li>● Understand and explain chasing arrows</li> <li>● Create Google slideshow of LEED architectural building LEED project</li> <li>● Determine Leed status, Green elements</li> <li>● Learn Google Slides technology skills</li> </ul>			
<b>Instructional/Assessment Scaffolds</b> <i>(Modifications/Accommodations) – planned for prior to instruction</i>		<b>English Language Learners</b>	<b>Special Education Learners</b>	<b>Struggling Learners</b>	<b>Advanced Learners</b>
		<ul style="list-style-type: none"> <li>● Additional time</li> <li>● Flexibility in Green vs Green assignment</li> <li>● Allow redos/retakes</li> <li>● Read aloud</li> <li>● Clarify directions</li> <li>● Preview procedures</li> <li>● Give one on one</li> <li>● Provide a buddy</li> </ul>	<ul style="list-style-type: none"> <li>● Additional time</li> <li>● Flexibility in details of LEED Project and Green or not Green assignment</li> <li>● Allow redos/retakes</li> <li>● Read aloud</li> <li>● Clarify directions</li> <li>● Preview procedures</li> <li>● Flexible</li> </ul>	<ul style="list-style-type: none"> <li>● Additional time</li> <li>● Flexibility in details of LEED Project and Green or not Green assignment</li> <li>● Read aloud</li> <li>● Clarify directions</li> <li>● Allow for retakes</li> <li>● Flexible grouping</li> </ul>	<ul style="list-style-type: none"> <li>● Google classroom enrichment</li> <li>● Working with other accelerated learners</li> <li>● Finding local LEED buildings</li> </ul>

			<ul style="list-style-type: none"> <li>grouping</li> <li>• Guide to appropriate area of notebook</li> </ul>	
<b>Differentiated Instructional Methods:</b> <i>(Multiple means for students to access content and multiple modes for student to express understanding)</i>		<b>Access</b> (Resources and/or Process)		<b>Expression</b> (Products and/or Performance)
		<ul style="list-style-type: none"> <li>• Google Classroom</li> <li>• Sample <del>posters</del> and LEED projects</li> </ul>		<ul style="list-style-type: none"> <li><del>Poster</del></li> <li>LEED slideshow</li> <li>Google slideshow: Sustainable Products</li> </ul>
<b>Vocabulary</b> <i>Highlight key vocabulary (both Tier II and</i>		Tier 2 <ul style="list-style-type: none"> <li>• Sustainable</li> <li>• Green</li> <li>• Slogan</li> <li>• Logo</li> <li>• Salvage</li> <li>• Closed loop system</li> <li>• Carbon footprint</li> </ul>		

Tier III words)		<ul style="list-style-type: none"> <li>● Greenwashing</li> <li>● LEED</li> </ul>	
Integration of Technology SAMR		<p>Substitution: Use Google Classroom to take and review notes, concepts, and instructions</p> <p>Augmentative: Students watch review videos</p> <p>Modification: Students work through interactive sites</p> <p>Redefined:</p>	
Interdisciplinary Connections NJ Student Learning Standards		<p>RL.6.4. Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of a specific word choice on meaning and tone.</p> <p>RI.6.7. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.</p> <p>NJSLSA.W7. Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.</p> <p>NJSLSA.W8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.</p>	
21 <sup>st</sup> Century Themes/ Skills P21 Framework		<b>Themes</b>	<b>Skills</b>
		<ul style="list-style-type: none"> <li>● ENVIRONMENTAL LITERACY</li> </ul>	<ul style="list-style-type: none"> <li>● Flexibility and adaptability</li> <li>● Initiative and self direction</li> <li>● Leadership and responsibility</li> <li>● Creativity</li> <li>● Collaboration</li> <li>● Communication</li> <li>● Critical Thinking</li> <li>● Media Literacy</li> </ul>

			<ul style="list-style-type: none"> <li>• Manage projects</li> </ul>
<b>Resources/Materials</b>		<ul style="list-style-type: none"> <li>• PLTW: Project Lead the Way site</li> <li>• Google classroom teacher created slides</li> <li>• Launch logs</li> <li>• Rulers</li> <li>• Videos (edpuzzles)</li> </ul>	

Instructional Unit Map			
Course Title: Green Architecture			
<b>Unit Title</b>	Unit 3- REVIT	<b>Start Date:</b>	
		<b>Length of Unit:</b>	20 days
<b>Content Standards</b> <i>What do we want them to know, understand, &amp; do?</i>	MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible	<b>Learning Goals</b>	<ul style="list-style-type: none"> <li>-The ability to measure precisely and accurately is important at school and at home, at work, and when pursuing hobbies.</li> <li>-Numerous symbols are part of architectural plans. It is important to be able to identify such symbols..</li> <li>-Using graph paper and an architectural scale can help in the visualization of a space before the start of the prototype phase.</li> <li>-Architecture today uses computer-aided design (CAD) systems to quickly generate and annotate working drawings.</li> <li>-Three-dimensional computer modeling uses descriptive geometry, geometric relationships, and dimensions to communicate an idea or solution to a technological problem.</li> <li>-Using alternative materials in construction is beneficial to our environment.</li> <li>-Architecture and construction emphasize using environmentally</li> </ul>

solutions.

MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

- 9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).

9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).

**friendly practices in their career fields.**

**-Architects and engineers use the design process when designing and building structures.**

**-Creating a functional and environmentally friendly home is considered sustainable housing that could be adapted for emergency shelter in disaster areas**

<b>Essential Questions</b>	<ol style="list-style-type: none"> <li>1. What are the advantages and disadvantages of using repurposed materials, such as a shipping container, for constructing living or work space?</li> <li>2. What materials are used in construction to improve the energy-efficiency of a building?</li> <li>3. How is the environment affected by shipping containers sitting on the dock?</li> </ol>		
<b>Assessments</b> <i>How will we know they have gained the knowledge &amp; skills?</i>	<b>Formative</b>	<b>Summative</b>	<b>Alternative</b>
	<b>English L</b> <ul style="list-style-type: none"> <li>• Launch log</li> <li>• Questioning</li> <li>• Observation</li> <li>• Blueprint of shipping container</li> </ul>	<ul style="list-style-type: none"> <li>• Final Revit Shipping Container Home</li> <li>• Final test on Green Architecture given at end of course</li> </ul>	<b>Struggling Learners</b>
<b>Unit Pre-Assessment(s)</b> <i>What do they already know?</i>	Teacher generated introduction questions		
<b>Instructional Strategies/</b>	<ul style="list-style-type: none"> <li>• Discuss and write daily vocabulary</li> <li>• Shipping Container Project</li> <li>• Create a blueprint using an architectural rule and follow the criteria and constraints</li> </ul>		



<b>Student Activities</b>	<ul style="list-style-type: none"> <li>● Recreate blueprint plans on REVIT program</li> </ul>			
<b>Instructional/Assessment Scaffolds</b> <i>(Modifications/Accommodations) – planned for prior to instruction</i>	<b>English Language Learners</b>	<b>Special Education Learners</b>	<b>Struggling Learners</b>	<b>Advanced Learners</b>
	<ul style="list-style-type: none"> <li>● Additional time</li> <li>● Flexibility in REVIT extras</li> <li>● Allow redos/retakes</li> <li>● Read aloud</li> <li>● Clarify Directions</li> <li>● Preview procedures</li> <li>● Give one on one</li> <li>● Provide a buddy</li> </ul>	<ul style="list-style-type: none"> <li>● Additional time</li> <li>● Flexibility in REVIT extras</li> <li>● Allow redos/retakes</li> <li>● Read aloud</li> <li>● Clarify directions</li> <li>● Preview procedures</li> <li>● Flexible grouping</li> <li>● Provide buddy or aid</li> </ul>	<ul style="list-style-type: none"> <li>● Additional time</li> <li>● Flexibility in Extras FOR REVIT</li> <li>● Read aloud</li> <li>● Clarify directions</li> <li>● Allow for retakes</li> <li>● Flexible grouping</li> <li>● Provide Buddy or aid</li> </ul>	<ul style="list-style-type: none"> <li>● Google classroom enrichment</li> <li>● Working with other Struggling learnings</li> <li>● Add extras to project</li> </ul>
<b>Differentiated Instructional Methods:</b> <i>(Multiple means for students to access content and multiple</i>	<b>Access</b> (Resources and/or Process)		<b>Expression</b> (Products and/or Performance)	
	<ul style="list-style-type: none"> <li>● Google Classroom</li> <li>● Sample-projects</li> </ul>		Floorplanner projects	

<p><i>modes for student to express understanding)</i></p>		
<p><b>Vocabulary</b> <i>Highlight key vocabulary (both Tier II and Tier III words)</i></p>	<p>Tier 2</p> <ul style="list-style-type: none"> <li>● REVIT</li> <li>● Shipping container</li> <li>● Interior</li> <li>● Exterior</li> <li>● 3D</li> <li>● 2D</li> <li>● Water closet</li> <li>● Floor coverings</li> <li>● Window pane</li> <li>● Component</li> <li>● Elevation</li> </ul>	
<p><b>Integration of Technology</b> <u>SAMR</u></p>	<p>Substitution: Use Google Classroom to take and review notes, concepts, and instructions</p> <p>Augmentative Students watch videos</p> <p>Modification:</p> <p>Redefined: REVIT</p>	
<p><b>Interdisciplinary</b></p>	<p>RI.6.7. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.</p>	

<b>Connections</b> <u>NJ Student Learning Standards</u>		
<b>21<sup>st</sup> Century Themes/Skills</b> <u>P21 Framework</u>	<b>Themes</b>	<b>Skills</b>
<b>Resources/Materials</b>	<ul style="list-style-type: none"> <li>● ENVIRONMENTAL LITERACY</li> </ul>	
	<ul style="list-style-type: none"> <li>● PLTW: Project Lead the Way site</li> <li>● Google classroom teacher created slides</li> <li>● Launch logs</li> <li>● Yard sticks</li> <li>● Rulers</li> <li>● Architectural rulers</li> <li>● Graph paper for blueprints</li> <li>● Colored pencils</li> <li>● Architectural templates</li> <li>● Videos</li> </ul>	<ul style="list-style-type: none"> <li>● Flexibility and adaptability</li> <li>● Initiative and self direction</li> <li>● Leadership and responsibility</li> <li>● Creativity</li> <li>● Collaboration</li> <li>● Communication</li> <li>● Critical Thinking</li> <li>● Media Literacy</li> <li>● Apply technology effectively</li> <li>● Work independently</li> <li>● Manage projects</li> </ul>

## Instructional Unit Map

**Course Title: Green Architecture**

<b>Unit Title</b>	Unit 4- Balsa Wood an Architectural Challenge		<b>Start Date:</b>	Trimester
			<b>Length of Unit:</b>	20 days
<p><b>Content Standards</b> <i>What do we want them to know, understand, &amp; do?</i></p>	<p>MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.</p> <p>MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the</p>	<p><b>Learning Goals</b></p>	<ul style="list-style-type: none"> <li>-The ability to measure precisely and accurately is important at school and at home, at work, and when pursuing hobbies.</li> <li>- Numerous symbols are part of architectural plans. It is important to be able to identify such symbols.</li> <li>-Wood frame construction is popular because it is economical and strong.</li> <li>-Using graph paper and an architectural scale can help in the visualization of a space before the start of the prototype phase.</li> </ul>	

	problem.			
<b>Essential Questions</b>	<ol style="list-style-type: none"> <li>1. <i>Why is knowledge of area and perimeter important when designing and constructing a building?</i></li> <li>2. <i>Describe a potential consequence if you do not pay attention to accuracy and precision when designing and constructing a building.</i></li> <li>3. <i>How do architects pay attention to both form and function when designing and constructing a building?</i></li> </ol>			
<b>Assessments</b> <i>How will we know they have gained the knowledge &amp; skills?</i>	<b>Formative</b>	<b>Summative</b>		<b>Alternative</b>
	<ul style="list-style-type: none"> <li>● Launch Log</li> <li>● Questioning</li> <li>● Observation</li> <li>● Blueprint of wall with door or window</li> </ul>	<ul style="list-style-type: none"> <li>● Balsa wood wall with window or door final project</li> <li>● Final test on Green Architecture given at end of course</li> </ul>		
<b>Unit Pre-Assessment(s)</b> <i>What do they already know?</i>	Teacher generated introduction questions			

<b>Instructional Strategies/ Student Activities</b>	<ul style="list-style-type: none"> <li>● Discuss and write daily vocabulary</li> <li>● Create blueprint for wall</li> <li>● Build balsa wood wall with door or window</li> <li>● Meet criteria and constraints</li> </ul> <p style="text-align: center;"><u>part 1</u> <u>part 2</u></p>			
<b>Instructional/Assessment Scaffolds</b> <i>(Modifications /Accommodations) – planned for prior to instruction</i>	<b>English Language Learners</b>	<b>Special Education Learners</b>	<b>Struggling Learners</b>	<b>Advanced Learners</b>
	<ul style="list-style-type: none"> <li>● Additional time</li> <li>● Flexibility in labeling of blueprint</li> <li>● Allow redos/retakes</li> <li>● Read aloud quiz</li> <li>● Clarify directions</li> <li>● Preview procedures</li> <li>● Give one on one</li> <li>● Provide a buddy</li> </ul>	<ul style="list-style-type: none"> <li>● Additional time</li> <li>● Flexibility in final project: just wall no window or door</li> <li>● Allow redos/retakes</li> <li>● Read aloud</li> <li>● Clarify directions</li> <li>● Preview procedures</li> <li>● Flexible grouping</li> <li>● Provide buddy or aid</li> </ul>	<ul style="list-style-type: none"> <li>● Additional time</li> <li>● Flexibility in wall with window or door</li> <li>● Read aloud</li> <li>● Clarify directions</li> <li>● Allow for retakes</li> <li>● Flexible grouping</li> <li>● Provide Buddy or aid</li> </ul>	<ul style="list-style-type: none"> <li>● Google classroom enrichment</li> <li>● Working with other Struggling learnings</li> <li>● Combine wall to create room</li> </ul>
<b>Differentiated Instructional Methods:</b>	<b>Access</b> (Resources and/or Process)		<b>Expression</b> (Products and/or Performance)	
	<ul style="list-style-type: none"> <li>● Google Classroom</li> <li>● Sample Balsa Wood projects</li> </ul>		Balsa wood project	

<p><i>(Multiple means for students to access content and multiple modes for student to express understanding)</i></p>		
<p><b>Vocabulary</b> <i>Highlight key vocabulary (both Tier II and Tier III words)</i></p>	<p>Tier 2</p> <ul style="list-style-type: none"> <li>● Balsa wood</li> <li>● Sole plate</li> <li>● Top plate</li> <li>● Wall studs</li> </ul>	
<p><b>Integration of Technology</b> <u>SAMR</u></p>	<p>Substitution: Use Google Classroom to take and review notes, concepts, and instructions</p> <p>Augmentative Students watch review videos</p> <p>Modification:</p> <p>Redefined:</p>	
<p><b>Interdisciplinary Connections</b></p>	<p>RI.6.7. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.</p>	

<u>NJ Student Learning Standards</u>		
<b>21<sup>st</sup> Century Themes/Skills</b> <u>P21 Framework</u>	<b>Themes</b>	<b>Skills</b>
<b>Resources/ Materials</b>	<ul style="list-style-type: none"> <li>● ENVIRONMENTAL LITERACY</li> </ul>	<ul style="list-style-type: none"> <li>● Flexibility and adaptability</li> <li>● Initiative and self direction</li> <li>● Leadership and responsibility</li> <li>● Creativity</li> <li>● Collaboration</li> <li>● Communication</li> <li>● Critical Thinking</li> <li>● Work independently</li> <li>● Manage projects</li> </ul>
<ul style="list-style-type: none"> <li>● PLTW: Project Lead the Way site</li> <li>● Google classroom teacher created slides</li> <li>● Launch logs</li> <li>● Rulers</li> <li>● Architectural rulers</li> <li>● Graph paper for blueprints</li> <li>● Colored pencils</li> <li>● Balsa wood</li> <li>● Razors / knives</li> <li>● Balsa wood glue</li> <li>● Push pins</li> <li>● Videos</li> </ul>		