



WEST SHORE SCHOOL DISTRICT

Design/Construction/Safety/Layout Learning Module

Title of Module	6 th grade Design/Construction/Safety/Layout	Grade Level	6
Curriculum Area	Technology Education	Time Frame	3 weeks

Desired Results

Science and Engineering Practices	Crosscutting Practices
<ol style="list-style-type: none"> 1. Asking questions and defining problems. 2. Developing and using models. 3. Planning and carrying out investigations. 4. Analyzing and interpreting data. 5. Using mathematics and computational thinking. 6. Constructing explanations and designing solutions. 7. Engaging in argument from evidence. 8. Obtaining, evaluating and communicating information. 	<ol style="list-style-type: none"> 1. Patterns 2. Cause and effect 3. Scale, proportion, and quantity 4. Systems and system models 5. Measurement 6. Math shifts

Transfer Goals

- Understand proper use of tools and safety
- Identify different engineering and design processes, strategies, and proper application
- Be able to employ thumbnail sketches in the design processes
- Understand proper measuring units
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Key Learnings/Big Ideas

- Design and engineering
- Construction techniques & terminology
- Making inferences and/or draw conclusions based on information from blue prints.
- Listen critically and respond to others in small and large group situations.
- Work with tools, materials, and technological concepts and processes.

Content and Reading and Writing Standards

Indicate eligible content standards by highlighting.
Include PA Core Reading and Writing for Science, Technical Subjects, Mathematics.
 Science & Technology & Engineering Education—CC.3.5.6-8.C
 Science & Technology & Engineering Education—CC.3.5.6-8.I
 Science & Technology & Engineering Education—3.4.6.A2
 Science & Technology & Engineering Education—3.4.6.C1
 Science & Technology & Engineering Education—3.4.6.C3
 Science & Technology & Engineering Education—3.4.6.C2
 Science & Technology & Engineering Education—3.4.6.A3

Essential Questions	Vocabulary (Best Practices) Utilize concepts & competencies to add to vocabulary
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<p>Unit EQ:</p> <ul style="list-style-type: none"> • What design considerations go into making a sturdy structure? • What construction methods are beneficial to making a structure? 	<p>Vocabulary:</p> <p>Construction Scale Efficiency Load Mass Force Stress Design Computer modeling/simulation Symmetry</p>
<p>Concepts Students will know...</p>	<p>Skills/Competencies (I Can...) Based on LEQs Students will be able to...</p>
<ul style="list-style-type: none"> • The characteristics of a sturdy structure • The importance of collaboration in reaching a goal • The construction methods necessary in making a sturdy structure 	<ul style="list-style-type: none"> • How to design a sturdy structure • How to collaborate with other students • Using appropriate materials in a safe manner, construct a sturdy structure • Determine the efficiency of a structure

Assessment Evidence

Formative Assessment

- Incorporate technology to test a potential design
- Evaluate design process for tolerance and symmetry
- Evaluate stages of construction process

Summative Assessment

- Grade design using rubric
- Grade construction using rubric
- Efficiency of structure

Best Instructional Practices

- Subject Specific Best Practices (example: Science Processes)
 - Extended Thinking
 - Summarizing
 - Vocabulary in Context
 - Advance Organizers
 - Non-verbal Representation
 - Integration of Webb's Depth (examples)
 - Integration of 21st Century Skills (examples)
 - Reading and writing across disciplines (examples)
- Differentiated options (examples)

21 Century Skills/ STEM		
Learning and Innovation Skills	Information, Media, and Technology Skills	Life and Career Skills
Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration	Information Literacy Media Literacy ICT (Information, Communications and Technology) Literacy	Flexibility and Adaptability Initiative and Self -Direction Productivity and Accountability Leadership and Responsibility
Extended Thinking Summarizing Vocabulary in Context Advance Organizers Non-verbal Representation Integration of Webb's Depth (examples) Integration of 21 st Century Skills (examples) Reading and writing across disciplines (examples) Differentiated options (examples)		

Resources

Student	Teacher
<ul style="list-style-type: none"> • The Ruler Game http://www.rulergame.net • Teachers' websites • Bridge building and testing websites <ul style="list-style-type: none"> • Allen Middle School—Mr. Griffith http://www.wssd.k12.pa.us/webpages/MGriffith/ • New Cumberland Middle School – Andre Faranov http://www.wssd.k12.pa.us/webpages/AFaranov/link_s.cfm • Crossroads Middle School - Mr.Papieredin http://www.wssd.k12.pa.us/webpages/MPapieredin/ 	<ul style="list-style-type: none"> • Andre Faranov • Matthew Griffith • Michael Papieredin

Adapted from Wiggins, Grant and J. Mc Tighe. (1998). *Understanding by Design*, Association for Supervision and Curriculum Development, ISBN # 0-87120-313-8 (ppk)