Curriculum Framework – Gateway (2015-2016)
Green Architecture – Lesson 3 Architectural Challenge

Desired Results *(stage 1)*

ESTABLISHED GOALS
It is expected that students will…

- G1 – Demonstrate an ability to identify, formulate, and solve engineering problems.
- G2 – Demonstrate an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- G3 – Demonstrate an ability to design and conduct experiments, as well as to analyze and interpret data.
- G4 – Demonstrate an ability to apply knowledge of mathematics, science, and engineering.
- G5 – Demonstrate an ability to use the techniques, skills, and

Transfer

TRANSFER: *Students will be able to independently use their learning to …*

- T1 – Design a sustainable home using repurposed materials.
- T2 – Design and conduct experiments, analyze and interpret data to determine the best building material and insulation for an energy-efficient home.

Meaning

UNDERSTANDINGS: *Students will understand that …*

- U1 – The ability to measure precisely and accurately is important at school and at home, at work, and when pursuing hobbies.
- U2 – Numerous symbols are part of architectural plans. It is important to be able to identify such symbols.
- U3 – Wood frame construction is popular because it is economical and strong.
- U4 – Using graph paper and an architectural scale can help in the visualization of a space before the start of the prototype phase.
- U5 – Architecture today uses computer-aided design (CAD) systems to quickly generate and annotate working drawings.
- U6 – Three-dimensional computer modeling uses descriptive geometry, geometric relationships, and

ESSENTIAL QUESTIONS: *Students will keep considering …*

- Q1 –What are the advantages and disadvantages of using repurposed materials, such as a shipping container, for constructing living or work space?
- Q2 - What materials are used in construction to improve the energy-efficiency of a building?
- Q3 - How is the environment affected by shipping containers sitting on the dock?

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modern engineering tools necessary for engineering practice. • G6 – Pursue the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context. • G7 – Demonstrate an understanding of professional and ethical responsibility. • G8 – Demonstrate an ability to function on multidisciplinary teams. • G9 – Demonstrate an ability to communicate effectively. • G10 – Gain knowledge of contemporary issues. • G11 – Recognize the need for, and develop an ability to engage in life-long learning.	dimensions to communicate an idea or solution to a technological problem. • U7 – Using alternative materials in construction is beneficial to our environment. • U8 – Architecture and construction emphasize using environmentally friendly practices in their career fields. • U9 – Architects and engineers use the design process when designing and building structures. • U10 – Shipping containers stack up as waste unless they are repurposed; they offer many benefits as construction materials that are strong, water proof, pest proof, recycled, easy to build with, etc. • U11 – Creating a functional and environmentally friendly home is considered sustainable housing that could be adapted for emergency shelter in disaster areas.	
	Acquisition	
	KNOWLEDGE: *Students will …* • K1 – Demonstrate knowledge of measurement, construction, and design. U2, U4 • K2 – Identify the parts of a wall section. U3	***SKILLS:*** *Students will …* • S1 – Measure accurately using a tape measure and architectural scale. U1 • S2 – Read and interpret a blueprint of a floor plan. U2 • S3 – Construct a model of the framing of a wall section. U3 • S4 – Demonstrate use of the Design Process including a Design Brief, Sketching, and Decision Making Matrix. U4, U9 • S5 – Use Autodesk Revit Architecture to create an architectural drawing. U5, U6 • S6 – Design an environmentally friendly home U7, U8, U9, U10, U11

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Evidence *(stage 2)*		
Activities (A) Projects (P) Problems(B)	Assessment FOR Learning	Assessment OF Learning
A.7.3.1 Wood Frame Construction	• Essential Questions	• Conclusion Questions
A 7.3.2 Building a Shed (Wall)	• Essential Questions	• Conclusion Questions
A 7.3.3 Why Insulate?	• Essential Questions	• Conclusion Questions
B 7.3.4 Shipping Container Home	• Essential Questions • Shipping Container Rubric	• Conclusion Questions • Shipping Container Rubric

Learning Plan *(stage 3)*	
Activities (A) Projects (P) Problems(B)	Knowledge and Skills
A.7.3.1 Wood Frame Construction	K1, K2, S1
A 7.3.2 Building a Shed (Wall)	K1, K2, S1, S2, S3
A 7.3.3 Why Insulate?	K1, K2, S1, S2, S3
B 7.3.4 Shipping Container Home	K1, S2, S4, S5, S6

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