

PLTW: Civil Engineering and Architecture – Grades 10-12

SUBJECT: Civil Engineering and Architecture		GRADE: 10-12	
Unit Title: Overview of Civil Engineering and Architecture		Time Frame: First Marking Period	
UNIT OVERVIEW			
History of Civil Engineering and Architecture <ul style="list-style-type: none"> ● Design Principles and Elements ● Architectural Styles ● Architectural Features Careers in Civil Engineering and Architecture			
LRG SKILLS AND DISPOSITIONS		PA STANDARDS	
Communication & Empathy Collaboration & Teamwork Continual Learning & A Growth Mindset		3.4.12.A1 3.4.12.A2 3.4.12.A3 3.4.12.B1 3.4.12.B2 3.4.10.C1 3.4.10.D1 3.4.10.D3 3.4.10.E3 3.4.10.E7 3.4.12.E7	
COMPETENCIES		LEARNING TARGETS	
Nature and Characteristics of Technology and Engineering		<ul style="list-style-type: none"> ● I can explain how the world around them guides technological development and engineering design. 	

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Residential Design

- Green Building and Sustainable Design
- Designing for the Client
- Residential Foundations
- Electrical Systems
- Site Planning
- Water Supply
- Plumbing
- Wastewater Management

LRG SKILLS AND DISPOSITIONS	PA STANDARDS
Communication & Empathy Collaboration & Teamwork Continual Learning & A Growth Mindset Critical Thinking & Problem Solving Creativity & Innovation	3.4.12.A1 3.4.12.A2 3.4.12.A3 3.4.12.B1 3.4.12.B2 3.4.10.C1 3.4.10.D1 3.4.10.D3 3.4.10.E3 3.4.10.E7 3.4.12.E7
COMPETENCIES	LEARNING TARGETS
Nature and Characteristics of Technology and Engineering	<ul style="list-style-type: none"> ● I can explain how the world around them guides technological development and engineering design.
Core Concepts of Technology and Engineering	<ul style="list-style-type: none"> ● I can demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making.

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	<ul style="list-style-type: none">● I can select resources that involve tradeoffs between competing values, such as availability, cost, desirability, and waste, while solving problems.
Impacts of Technology	<ul style="list-style-type: none">● I can evaluate ways that technology can impact individuals, society, and the environment.
History of Technology	<ul style="list-style-type: none">● I can relate how technological development has been evolutionary, often the result of a series of refinements to basic inventions or technological knowledge.
Design in Technology and Engineering Education	<ul style="list-style-type: none">● I can apply principles of human-centered design.● I can illustrate principles, elements, and factors of design.● I can apply a broad range of design skills to their design process.

SUBJECT: Civil Engineering and Architecture

GRADE: 10-12

Unit Title: Commercial Applications

Time Frame: Second, Third, and Fourth Marking Period

UNIT OVERVIEW

Commercial Building Systems

- Land Use and Development
- Wall Systems
- Roof Systems
- Structural Efficiency
- Floor Systems

Structures

- Loads

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- Beam Analysis
- Beam Design
- Foundations

Services and Utilities

- Electrical Systems
- Heating, Ventilation, and Air-Conditioning Systems
- Water Supply
- Plumbing
- Wastewater Management

Site Considerations

- Site Survey
- Parking Lot Design
- Soil Testing
- StormWater Management

LRG SKILLS AND DISPOSITIONS	PA STANDARDS
Communication & Empathy Collaboration & Teamwork Continual Learning & A Growth Mindset Critical Thinking & Problem Solving Creativity & Innovation	3.4.12.A1 3.4.12.A2 3.4.12.A3 3.4.12.B1 3.4.12.B2 3.4.10.C1 3.4.10.D1 3.4.10.D3 3.4.10.E3 3.4.10.E7 3.4.12.E7
COMPETENCIES	LEARNING TARGETS
Nature and Characteristics of Technology and Engineering	<ul style="list-style-type: none"> ● I can explain how the world around them guides technological development and engineering design.

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Core Concepts of Technology and Engineering	<ul style="list-style-type: none"> I can demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making.
	<ul style="list-style-type: none"> I can select resources that involve tradeoffs between competing values, such as availability, cost, desirability, and waste, while solving problems.
Impacts of Technology	<ul style="list-style-type: none"> I can evaluate ways that technology can impact individuals, society, and the environment.
History of Technology	<ul style="list-style-type: none"> I can relate how technological development has been evolutionary, often the result of a series of refinements to basic inventions or technological knowledge.
Design in Technology and Engineering Education	<ul style="list-style-type: none"> I can apply principles of human-centered design. I can illustrate principles, elements, and factors of design. I can apply a broad range of design skills to their design process.

SUBJECT: Civil Engineering and Architecture		GRADE: 10-12	
Unit Title: Commercial Building Design		Time Frame: Fourth Marking Period	
UNIT OVERVIEW			
<p>Commercial Building Design Problem</p> <ul style="list-style-type: none"> Team Building Property Description Site Discovery 			

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<ul style="list-style-type: none"> Commercial Project Viability and Project Management <p>Commercial Building Design Presentation</p>	
LRG SKILLS AND DISPOSITIONS	PA STANDARDS
<p>Communication & Empathy Collaboration & Teamwork Continual Learning & A Growth Mindset Critical Thinking & Problem Solving Creativity & Innovation</p>	<p>3.4.12.A1 3.4.12.A2 3.4.12.A3 3.4.12.B1 3.4.12.B2 3.4.10.C1 3.4.10.D1 3.4.10.D3 3.4.10.E3 3.4.10.E7 3.4.12.E7</p>
COMPETENCIES	LEARNING TARGETS
Nature and Characteristics of Technology and Engineering	<ul style="list-style-type: none"> I can explain how the world around them guides technological development and engineering design.
Core Concepts of Technology and Engineering	<ul style="list-style-type: none"> I can demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making. I can select resources that involve tradeoffs between competing values, such as availability, cost, desirability, and waste, while solving problems.
Impacts of Technology	<ul style="list-style-type: none"> I can evaluate ways that technology can impact individuals, society, and the environment.

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History of Technology	<ul style="list-style-type: none">● I can relate how technological development has been evolutionary, often the result of a series of refinements to basic inventions or technological knowledge.
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