

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 • 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		• I can explain how the world around them guides technological development and engineering design.	
Core Concepts of Technology and Engineering		• 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	• I can evaluate ways that technology can impact individuals, society, and the environment.
History of Technology	• 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	• 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: Residential Design		Time Frame: First and Second Marking Period	
UNIT OVERVIEW			
Building Design and Construction ● Wood Frame Systems ● Roof Systems			
Cost and Efficiency Analysis ● Heat Loss/Gain			
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

- I can explain how the world around them guides technological development and engineering design.

Core Concepts of Technology and Engineering

- 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

- I can evaluate ways that technology can impact individuals, society, and the environment.

History of Technology	• 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	• 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 ● 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	• I can explain how the world around them guides technological development and engineering design.
Core Concepts of Technology and Engineering	• 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	I can evaluate ways that technology can impact individuals, society, and the environment.
History of Technology	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	- 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	
Commercial Building Design Problem - Team Building - Property Description - Site Discovery - Commercial Project Viability and Project Management Commercial Building Design Presentation	
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

Critical Thinking & Problem Solving: Creativity & Innovation:	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	I can explain how the world around them guides technological development and engineering design.
Core Concepts of Technology and Engineering	- 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	I can evaluate ways that technology can impact individuals, society, and the environment.
History of Technology	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	- 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.