Unit 10: Modern Architectural Design

Content Area: **Applied Technology**
Course(s):
Time Period: **Marking Period 4**
Length: **5 Weeks**
Status: **Published**

Brief Summary of Unit

Introduction:

Students will develop knowledge and understanding related to modern architectural design and its influence on the built environment. Through the study of contemporary architectural movements, emerging technologies, design philosophies, and cultural influences, students will examine the factors that shape modern building design. Students will strengthen previously acquired CAD skills while developing new technical and visualization skills that enable them to effectively communicate design ideas and architectural solutions. Using research, analysis, and the design process, students will apply modern design concepts to the development of a building project. Students may also construct physical or digital models to further communicate and evaluate their design solutions. This unit will run concurrently with other units throughout the school year.

Revision Date: July 2026

Essential Questions/Enduring Understandings

Essential Questions:

How can the design loop be applied to the design and development of buildings?

What factors influence the form, function, and appearance of a building?

How can CAD be used to effectively communicate architectural design solutions?

Enduring Understandings:

Architecture is shaped by a variety of social, cultural, technological, environmental, and economic influences.

Modern architecture has been significantly influenced by the technological advancements of the twentieth and twenty-first centuries.

Architectural design is the result of an iterative design process that involves research, analysis, development, evaluation, and refinement.

Architects are key members of the construction industry and collaborate with a variety of professionals throughout the design and construction process.

Students Will Know/Students Will Be Skilled At

Students will know:

Architecture is influenced by a wide range of factors, including culture, society, technology, economics, environmental conditions, and client needs.

Modern architecture has been significantly shaped by the technological innovations and construction methods developed during the twentieth and twenty-first centuries.

Architectural design is the result of an iterative design process that incorporates research, analysis, development, evaluation, and refinement.

Architects are important members of the construction industry and collaborate with engineers, contractors, clients, and other professionals throughout the design and construction process.

Students will be able to:

Critically evaluate and distinguish between functional requirements and aesthetic decisions within an architectural design.

Analyze how technological advancements influence building form, construction methods, and architectural expression.

Apply the design loop to efficiently identify challenges, develop solutions, and refine architectural designs.

Research, develop, document, and communicate design solutions using industry-standard design practices.

Create, organize, and present project work through a professional digital portfolio.

Learning Plan

- Preview the essential questions and establish connections to the concepts, skills, and learning objectives that will be explored throughout the unit.
- Examine guiding questions, including:
    - What should a library, concert hall, or movie theater look like, and why?
    - Should a house designed today look the same as one designed 50, 100, or 200 years ago?
    - How have changes in society, technology, and lifestyle influenced residential design over time?
    - What characteristics and features are essential to a successful house design?
    - How has technology influenced the appearance, construction, and function of modern buildings?
    - What factors influence the design and appearance of office buildings and other commercial structures?
    - How can the design loop be used to address the challenges and opportunities associated with

contemporary building design?

- How do architectural philosophies and design movements shape the built environment?

- Research and prepare a biography of a significant architect, including examples of the architect's work and an analysis of the design principles, influences, and contributions reflected in those projects.
- Participate in lectures, discussions, and presentations focused on architectural movements, contemporary design philosophies, and the influence of technology on modern architecture.
- Observe demonstrations of architectural presentation techniques, which may include airbrush rendering, pen-and-ink illustration, digital visualization, and other professional presentation methods.
- Design a house, school, concert hall, or other building type that reflects a contemporary architectural philosophy, design movement, or cultural influence.
- Develop a design solution that demonstrates an understanding and application of contemporary architectural concepts, aesthetics, functionality, and user needs.
- Create presentation drawings, sketches, renderings, and supporting materials that effectively communicate the design intent and architectural vision of the project.
- Formative assessments will be conducted throughout the design process to monitor student understanding, provide feedback, and support the refinement of design solutions.
- Summative assessment of the design project will be conducted collaboratively by the student and teacher using a rubric aligned with the project objectives, design criteria, and presentation requirements.
- Complete a unit test or quiz assessing understanding of modern architecture, design philosophies, architectural history, and related course content.
- Complete a written response or writing prompt demonstrating understanding of key concepts, architectural influences, and design decisions explored throughout the unit.

Assessment

Formative Assessment:
Teacher will monitor student progress throughout the learning process.

Summative assessment:
Answer the essential questions
Demonstrate through hands-on activities the design of a building that is the product of the design process and is relevant to contemporary time. Communicate the design with drawings and possibly models.Demonstrate the ability to use software and technical drawing conventions to communicate a design effectively.
Design and create presentation drawings for a building that demonstrates understanding of means of egress, curtain wall and steel construction. Maintain a log to explain how the design evolved, including sources of information and criticism. The presentation will be included in an electronic portfolio. The presentation will include a written description that describes the technical aspects of the proposal.The presentation will be

evaluated using teacher and student designed rubrics. Write a response to one or more writing prompts. Possible prompts: Identify an important 20th century architect and describe his/her significance. Explain and provide an example of how the phrase, "form follows function" manifests itself in design.

Alternate Assessment:
Presentation of concert hall music venue of student choice

Benchmark:
Final Exam

Materials

The CADD LAB-computers equipped with up-to-date AutoCAD and/or other design and drafting software, presentation software, productivity software, a scanner and printers/plotters.

Traditional drafting equipment and supplies-vellum, colored and graphite pencils, pen and ink, drawing boards, tape, scissors, t-squares, triangles etc.

Chip-board, X-acto knives and other model making supplies.

A computer with INTERNET based presentation software (i.e. Prezi and Google Slides) and Microsoft Powerpoint.

3-D printer and supplies

Safety glasses

INTERNET resources and tutorials on how to use CAD software.

Teacher e-board.

SmartBoard use for teacher presentation and interactive lessons

SmartBoard use for student presentations.

Model making materials, dependant on projects that used.

Standards

TECH.K-12.1.1	Empowered Learner
9.4.12.CI	Creativity and Innovation
9.2.12.CAP	Career Awareness and Planning
	There are strategies to improve one's professional value and marketability.
L.SS.9–10.1	Demonstrate command of the system and structure of the English language when writing

	or speaking.
TECH.K-12.1.1.a	articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.
9.2.12.CAP.2	Develop college and career readiness skills by participating in opportunities such as structured learning experiences, apprenticeships, and dual enrollment programs.
	Innovative ideas or innovation can lead to career opportunities.
TECH.K-12.1.1.c	use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
9.4.12.CI.2	Identify career pathways that highlight personal talents, skills, and abilities (e.g., 1.4.12prof.CR2b, 2.2.12.LF.8).
9.2.12.CAP.3	Investigate how continuing education contributes to one's career and personal growth.
9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
	Career planning requires purposeful planning based on research, self-knowledge, and informed choices.
TECH.K-12.1.2	Digital Citizen
9.4.12.CT	Critical Thinking and Problem-solving
L.KL.9–10.2	Apply knowledge of language to make effective choices for meaning, or style, and to comprehend more fully when reading, writing, speaking or listening.
9.2.12.CAP.5	Assess and modify a personal plan to support current interests and post-secondary plans.
	Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed.
9.4.12.CT.1	Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
9.2.12.CAP.7	Use online resources to examine licensing, certification, and credentialing requirements at the local, state, and national levels to maintain compliance with industry requirements in areas of career interest.
TECH.K-12.1.2.c	demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.
TECH.K-12.1.2.d	manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.
L.VL.9–10.3	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, including technical meanings, choosing flexibly from a range of strategies.
TECH.K-12.1.3	Knowledge Constructor
TECH.K-12.1.3.a	plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
LA.RST.9-10	Reading Science and Technical Subjects
	Key Ideas and Details
TECH.K-12.1.3.c	curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
TECH.K-12.1.3.d	build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.
LA.RST.9-10.1	Accurately cite strong and thorough evidence from the text to support analysis of science

	and technical texts, attending to precise details for explanations or descriptions.
LA.RST.9-10.2	Determine the central ideas, themes, or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.
TECH.K-12.1.4	Innovative Designer
LA.RST.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
	Craft and Structure
TECH.K-12.1.4.a	know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
LA.RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.
TECH.K-12.1.4.b	select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
TECH.K-12.1.4.c	develop, test and refine prototypes as part of a cyclical design process.
LA.RST.9-10.5	Analyze the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).
	Integration of Knowledge and Ideas
LA.RST.9-10.7	Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
LA.RST.9-10.8	Determine if the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.
9.4.12.GCA	Global and Cultural Awareness
LA.RST.9-10.9	Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.
	Range of Reading and Level of Text Complexity
9.4.12.GCA.1	Collaborate with individuals to analyze a variety of potential solutions to climate change effects and determine why some solutions (e.g., political. economic, cultural) may work better than others (e.g., SL.11-12.1., HS-ETS1-1, HS-ETS1-2, HS-ETS1-4, 6.3.12.GeoGI.1, 7.1.IH.IPERS.6, 7.1.IL.IPERS.7, 8.2.12.ETW.3).
LA.RST.9-10.10	By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.
TECH.K-12.1.6	Creative Communicator
TECH.K-12.1.6.a	choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
TECH.K-12.1.6.b	create original works or responsibly repurpose or remix digital resources into new creations.
TECH.K-12.1.6.c	communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
TECH.K-12.1.6.d	publish or present content that customizes the message and medium for their intended audiences.
9.4.12.TL	Technology Literacy
	Digital tools differ in features, capacities, and styles. Knowledge of different digital tools is

	helpful in selecting the best tool for a given task.
9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).
	Engineering design is a complex process in which creativity, content knowledge, research, and analysis are used to address local and global problems. Decisions on trade-offs involve systematic comparisons of all costs and benefits, and final steps that may involve redesigning for optimization.
8.2.12.ED.1	Use research to design and create a product or system that addresses a problem and make modifications based on input from potential consumers.
	Collaborative digital tools can be used to access, record and share different viewpoints and to collect and tabulate the views of groups of people.
8.2.12.ED.2	Create scaled engineering drawings for a new product or system and make modification to increase optimization based on feedback.
8.2.12.ED.3	Evaluate several models of the same type of product and make recommendations for a new design based on a cost benefit analysis.
8.2.12.ED.4	Design a product or system that addresses a global problem and document decisions made based on research, constraints, trade-offs, and aesthetic and ethical considerations and share this information with an appropriate audience.
	Engineering design evaluation, a process for determining how well a solution meets requirements, involves systematic comparisons between requirements, specifications, and constraints.
8.2.12.ED.5	Evaluate the effectiveness of a product or system based on factors that are related to its requirements, specifications, and constraints (e.g., safety, reliability, economic considerations, quality control, environmental concerns, manufacturability, maintenance and repair, ergonomics).
ETW	Effects of Technology on the Natural World
	Development and modification of any technological system needs to take into account how the operation of the system will affect natural resources and ecosystems. Impacts of technological systems on the environment need to be monitored and must inform decision-making. Many technologies have been designed to have a positive impact on the environment and to monitor environmental change over time.
HS-ETS1	Engineering Design
HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
	Asking Questions and Defining Problems
	Asking questions and defining problems in 9–12 builds on K–8 experiences and progresses to formulating, refining, and evaluating empirically testable questions and design problems using models and simulations.
ETS1.A	Delimiting Engineering Problems
	Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them.
	Humanity faces major global challenges today, such as the need for supplies of clean water and food or for energy sources that minimize pollution, which can be addressed through engineering. These global challenges also may have manifestations in local communities.
HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
	Constructing Explanations and Designing Solutions

Integrated Accommodation and Modifications, Special Education students, English Language Learners, At-Risk Students, Gifted and Talented students, Career Education, and those with 504s