Unit 4: Architectural Programming

Content Area: **Applied Technology**
Course(s):
Time Period: **Marking Period 2**
Length: **2 weeks**
Status: **Published**

Summary

An architectural program is a written description of the requirements of a building. The document includes information about the size, location and specific requirements that are expected in the final design. Environmental concerns and the relationship of a building to the environment, and climate change are explored. Additional information, like images that can influence the design may be included. Students will develop a program for their dream house.

Revision Date: July 2024

Essential Questions/Enduring Understandings

Essential Questions:

How do architects know what to design?
How do architects solve problems?
What are the components of an architectural program?

Enduring Understandings:
A program is essential to the development of a successful design and provides criteria that define successful solutions.
the design loop.
Programming is the first step in the design loop.
Programs contain qualitative information like sizes and areas.
Programs contain qualitative information like open feeling, monumental, and secluded.
Programs contain information about technology integration.
Programs contain information about energy usage, environmentally informed material choices, and environmental concerns.

Objectives

Students will know:

a program describes the attributes of a proposed building.

vocabulary and terms including but not limited to: design loop, architectural design loop, programming, design brief, find alternate solutions, schematics, design development, presentation drawings.

buildings are designed to meet needs established in the program.

that the design loop is an iterative process

that the design loop provides a path to completing projects.

The 5 steps of the design loop.

What artifacts are produced in each step of the design loop.

Steps in the design loop relate to milestones toward achievement of a goal.

the criteria in the program is used to assess design progress at each step of the design loop.

steps in the design loop directly relate to specific activities and artifacts.

a program provides the expectations that include how a building responds to climate change.

a program provides specifications for energy efficiency, material life cycle analysis, and environmental impact.

Students will be skilled at:

Writing a program that describes the attributes of a proposed house or addition.

Quantifying the needs in a proposed project.

Describing the qualities of a proposed project, including written and graphic images of the goals of the project.

Using English and language arts skills to create a document.

Using math skills to develop quantitative requirements of parts and the whole of a house.

Learning Plan

Preview the essential questions and connect to learning throughout the unit.

Teacher will provide formative and summative assessments of skills attainment.

Describe components of an architectural program. Provide students with INTERNET resources that describe the requirements of a program. Teacher led presentation of a sample program.

Suggested activity: students write a program, a document, for their dream house. The program is to be graded with a rubric. Realistic guidelines will be developed.

Problem-oriented learning and suggested activity: students design a residence using their own program.

Students will maintain copies of work to demonstrate the application of the design loop.

Textbook for reference: Architecture, residential drawing and design by Kicklighter

Assessment

Formative Assessment:

Demonstrate knowledge and understanding of vocabulary through correct usage.

Exit Ticket

Sketch Book

Teacher Check - In

Summative assessment:

Answer the essential questions.

write a program that describes in detail the quantitative and qualitative aspects of a proposed building. (i.e. a house).

Complete writing prompts: Example: Explain the relationship between each step of the design loop and programming. Beyond sizes and dimensions, what type of information is in a program, and why is it important? What is produced in each step of the design loop?

Benchmark assessment:

Final exam

Alternative:

Dream House Presentation

Materials

core book list

Computers lab with INTERNET and Google Docs

Smartboard with projector

Textbook for reference: Architecture, Residential Drawing and design by Kicklighter

Standards

ELA.K-12.1	Developing Responsibility for Learning: Cultivating independence, self-reflection, and responsibility for one's own learning.
ELA.K-12.2	Adapting Communication: Adapting communication in response to the varying demands of audience, task, purpose, and discipline.
ELA.K-12.3	Valuing Evidence in Argumentation: Constructing viable claims and evaluating, defending, challenging, and qualifying the arguments of others.
ELA.K-12.4	Building Knowledge: Building strong content knowledge and connecting ideas across disciplines using a variety of text resources and media.
ELA.W	Writing
ELA.W.AW.11–12.1.D	Establish and maintain a style and tone appropriate to the audience and purpose (e.g., formal and objective for academic writing) while attending to the norms and conventions of the discipline in which they are writing.
ELA.W.AW.11–12.1.E	Provide a concluding paragraph or section that supports the argument presented (e.g., articulating implications or the significance of the topic).
ELA.W.IW.11–12.2	Write informative/explanatory texts (including the narration of historical events, scientific procedures/experiments, or technical processes) to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
ELA.W.IW.11–12.2.A	Introduce a topic; organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
ELA.W.IW.11–12.2.B	Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.
ELA.W.IW.11–12.2.D	Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic.
ELA.W.IW.11–12.2.E	Establish and maintain a style and tone appropriate to the audience and purpose (e.g., formal and objective for academic writing) while attending to the norms and conventions of the discipline in which they are writing.
ELA.W.IW.11–12.2.F	Provide a concluding paragraph or section that supports the argument presented (e.g., articulating implications or the significance of the topic).
ELA.SL.II.11–12.2	Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.

ELA.SL.PI.11–12.4	Present information, findings and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience.
SCI.HS-ESS3	Earth and Human Activity
SCI.HS-ESS3-5	Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.
	Analyzing and Interpreting Data
	Analyzing data in 9–12 builds on K–8 experiences and progresses to introducing more detailed statistical analysis, the comparison of data sets for consistency, and the use of models to generate and analyze data.
SCI.HS.ESS3.D	Global Climate Change
	Though the magnitudes of human impacts are greater than they have ever been, so too are human abilities to model, predict, and manage current and future impacts.
SCI.HS-ETS1	Engineering Design
SCI.HS-ETS1-4	Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.
SCI.HS.ETS1.B	Developing Possible Solutions
	Both physical models and computers can be used in various ways to aid in the engineering design process. Computers are useful for a variety of purposes, such as running simulations to test different ways of solving a problem or to see which one is most efficient or economical; and in making a persuasive presentation to a client about how a given design will meet his or her needs.
CS.9-12.ED	Engineering Design
WRK.9.2.12.CAP	Career Awareness and Planning
WRK.9.2.12.CAP.12	Explain how compulsory government programs (e.g., Social Security, Medicare) provide insurance against some loss of income and benefits to eligible recipients.
TECH.9.4.12.CI	Creativity and Innovation
TECH.9.4.12.CT	Critical Thinking and Problem-solving
TECH.9.4.12.DC	Digital Citizenship
	An individual's income and benefit needs and financial plan can change over time.
	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.
	Engineering design evaluation, a process for determining how well a solution meets requirements, involves systematic comparisons between requirements, specifications, and constraints.

Integrated Accommodations and Modifications...

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