Unit 6: The Environment and Site Specific Architecture

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

Summary

Students will explore how the slope of land affects the form of a building. Students will analyze a site and determine where entrances, garages and other improvements, such as a swimming pool are best located. Understanding the complexities of a site will help in problem-solving, and making decisions based on practical concerns.

Revision Date: July 2024

Essential Questions/Enduring Understandings

Essential Questions:

How does a site impact design and architecture?

What geographical site factors impact design?

How does topography impact design?

Essential Understandings:

The slope of a site affects the location, and form of improvements.

The slope of a site affects the location of garages, entrances, pools, driveways, etc.

Different locations have soil, water, temperature, earthquake, wind and other impacts on design.

A sloped site can be a setting for dramatic architecture.

Objectives

Students will know:

vocabulary terms including but not limited to contour line, ROW, north arrow, setback line, elevation, slope,

grade, riser, tread, stringer, contour line

building forms like split level, and colonial are responses to site conditions.

garage and floor elevations (height concerning grade) are critically determined.

Falling Water is an example of a house that is built on a slope.

no real site is perfectly flat.

setbacks and other constraints on design.

Students will be skilled at:

creating a site plan with improvements including a pool, house, driveway

analyzing contour lines, setback lines, north arrow, and other site features.

Learning Plan

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

Teacher will provide formative and summative assessments of skills attainment.

Teacher will provide a lecture and class discussion of terminology and strategies to analyze the site.

Suggested activity: Problem based learning activity: design a house with a pool, accessory building, and driveway on a sloped site. Provide students with a program and topographic site plan of a sloped site for improvements.

Suggested activity: Problem based learning activity: provide students with a site and a program to make a site plan with improvements like a pool, house, driveway and garage. Students will propose and provide a rationale for the placement of the improvements.

Suggested activity: Students research using the INTERNET to identify and analyze Falling Water by Frank L. Wright or another significant site specific work.

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

Assessment

Formative assessment:

Answer Question: what are the characteristics of a baseball field? What factors matter: north, level, drainage, size...?

demonstrate knowledge and understanding of vocabulary through correct usage.

exit tickets

sketchbook

participation in class discussions on site specific architecture

Teacher Check In

Summative assessment:

answer the essential questions.

create site sections to analyze the site conditions. Drawings will be assessed with a rubric.

propose the location of site improvements and explain the rationale for their placement with the use of drawings. Drawings will be assessed with rubrics.

create plans, sections, and elevations of a house on a sloped site. Drawings will be assessed with a rubric.

complete writing prompts: Example: No site is perfectly flat. A split-level house relates to the site by… Example: A sloped site makes the placement of improvements easier because...

Benchmark Assessment:

Final Exam

Alternative Assessment;

Presentation on a site improvement

Materials

core book list

AutoCAD-equipped computer lab,

Smartboard

Graph paper

Falling Water by Frank L. Wright-INTERNET Resources.

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

Standards

ELA.K-12.4	Building Knowledge: Building strong content knowledge and connecting ideas across disciplines using a variety of text resources and media.
ELA.K-12.5	Leveraging Technology: Employing technology and digital media thoughtfully, strategically and capably to enhance reading, writing, speaking, listening, and language use.
TECH.K-12.1.4	Innovative Designer
	Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.
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.
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.
TECH.K-12.1.4.d	exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.
MATH.9-12.A.REI.B	Solve equations and inequalities in one variable
MATH.9-12.A.REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
TECH.K-12.1.6	Creative Communicator
	Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.
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.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.
SCI.HS-ESS3	Earth and Human Activity
SCI.HS-ESS3-4	Evaluate or refine a technological solution that reduces impacts of human activities on climate change and other natural systems.
	Examples of data on the impacts of human activities could include the quantities and types of pollutants released, changes to biomass and species diversity, or areal changes in land surface use (such as for urban development, agriculture and livestock, or surface mining). Examples for limiting future impacts could range from local efforts (such as reducing, reusing, and recycling resources) to large-scale geoengineering design solutions (such as altering global temperatures by making large changes to the atmosphere or ocean).

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.9-12.8.2.12.NT.1	Explain how different groups can contribute to the overall design of a product.
CS.9-12.8.2.12.NT.2	Redesign an existing product to improve form or function.
CS.9-12.8.2.12.ETW.2	Synthesize and analyze data collected to monitor the effects of a technological product or system on the environment.
CS.9-12.8.2.12.ETW.3	Identify a complex, global environmental or climate change issue, develop a systemic plan of investigation, and propose an innovative sustainable solution.
CS.9-12.ED	Engineering Design
CS.9-12.NT	Nature of Technology
CS.9-12.ETW	Effects of Technology on the Natural World
WRK.9.2.12.CAP	Career Awareness and Planning
TECH.9.4.12.CI	Creativity and Innovation
TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.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).
TECH.9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
TECH.9.4.12.CT	Critical Thinking and Problem-solving
	Engineers use science, mathematics, and other disciplines to improve technology. Increased collaboration among engineers, scientists, and mathematicians can improve their work and designs. Technology, product, or system redesign can be more difficult than the original design.
	Engineering design evaluation, a process for determining how well a solution meets requirements, involves systematic comparisons between requirements, specifications, and constraints.
	With a growth mindset, failure is an important part of success.
	Securing an income involve an understanding of the costs and time in preparing for a career field, interview and negotiation skills, job searches, resume development, prior experience, and vesting and retirement plans.
	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.
	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.

Innovative ideas or innovation can lead to career opportunities.

Integrated Accommodation and Modifications, Special Education students, ...

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