Green Architecture

Lesson 1: Architectural Basis | 16 days

Activity 1.1: Measuring Practice

Activity 1.2: Architectural Measurement

Activity 1.3: Architectural Dimensioning

Activity 1.4: Measuring Your Classroom

Activity 1.5: Using Autodesk Revit - Creating Your Classroom Tutorial

Technology and Engineering
3.5.6-8.W (ETS) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Activity 1.6: Estimating Flooring Materials

Environmental Literacy and Sustainability
3.4.6-8.H Design a solution to an environmental issue in which individuals and societies can engage as stewards of the environment.

Technology and Engineering
3.5.6-8.W (ETS) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Activity 1.7: Bedroom Floor Plan

Technology and Engineering
3.5.6-8.W (ETS) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Activity 1.8: Fundamentals of Construction

Activity 1.9: Room Sizes and Relationships

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Activity 1.10: Reading a Floor Plan

Environmental Literacy and Sustainability
3.4.6-8.G Obtain and communicate information to describe how best resource management practices and environmental laws are designed to achieve environmental sustainability.

Activity 1.11: Bedroom Using Revit

Environmental Literacy and Sustainability
3.4.6-8.H Design a solution to an environmental issue in which individuals and societies can engage as stewards of the environment.

Technology and Engineering
3.5.6-8.P (ETS) Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Optional Project 1.12.a: Bedroom Remodeling Budget

Environmental Literacy and Sustainability
3.4.6-8.H Design a solution to an environmental issue in which individuals and societies can engage as stewards of the environment.

Technology and Engineering
3.5.6-8.P (ETS) Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Optional Project 1.12.b: Dream Bedroom Suite

Environmental Literacy and Sustainability
3.4.6-8.H Design a solution to an environmental issue in which individuals and societies can engage as stewards of the environment.

Technology and Engineering
3.5.6-8.P (ETS) Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

3.5.6-8.Q Apply a technology and engineering design thinking process.

Lesson 2: Introduction to Sustainable Architecture | 12 days

Activity 2.1a: Rebuilding Greensburg

Environmental Literacy and Sustainability
3.4.6-8.B Analyze and interpret data about how different societies (economic and social systems) and cultures use and manage natural resources differently.

3.4.6-8.G Obtain and communicate information to describe how best resource management practices and environmental laws are designed to achieve environmental sustainability.

Technology and Engineering
3.5.6-8.W (ETS) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

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Activity 2.1b: Rebuilding Greensburg (Alternative Activity)

Environmental Literacy and Sustainability

3.4.6-8.B Analyze and interpret data about how different societies (economic and social systems) and cultures use and manage natural resources differently.

3.4.6-8.G Obtain and communicate information to describe how best resource management practices and environmental laws are designed to achieve environmental sustainability.

Technology and Engineering

3.5.6-8.W (ETS) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Activity 2.2: Green Vocabulary

Environmental Literacy and Sustainability

3.4.6-8.G Obtain and communicate information to describe how best resource management practices and environmental laws are designed to achieve environmental sustainability.

Activity 2.3: Why Recycle?

Environmental Literacy and Sustainability

3.4.6-8.G Obtain and communicate information to describe how best resource management practices and environmental laws are designed to achieve environmental sustainability.

Technology and Engineering

3.5.6-8.D Analyze how the creation and use of technologies consumes renewable, nonrenewable, and inexhaustible resources; creates waste; and may contribute to environmental challenges.

3.5.6-8.E Consider the impacts of a proposed or existing technology and devise strategies for reducing, reusing, and recycling waste caused by its creation.

3.5.6-8.HH Create a closed-loop system that has a feedback path and requires no human intervention.

Activity 2.4: Save the Earth Comic Strip

Environmental Literacy and Sustainability

3.4.6-8.G Obtain and communicate information to describe how best resource management practices and environmental laws are designed to achieve environmental sustainability.

Activity 2.5: Indoor Air Quality

Environmental Literacy and Sustainability

3.4.6-8.G Obtain and communicate information to describe how best resource management practices and environmental laws are designed to achieve environmental sustainability.

Technology and Engineering

3.5.6-8.W (ETS) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

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Activity 2.6: Building Green

Environmental Literacy and Sustainability

3.4.6-8.G Obtain and communicate information to describe how best resource management practices and environmental laws are designed to achieve environmental sustainability.

3.5.6-8.JJ Apply informed problem-solving strategies to the improvement of existing devices or processes or the development of new approaches.

Activity 2.7: House Styles

Lesson 3: Architecture Challenge | 17 days + 3 optional days

Activity 3.1: Wood Frame Construction

Activity 3.2.a: Buildng a Shed (Balsa Wood)

Technology and Engineering

3.5.6-8.W (ETS) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

3.5.6-8.BB Demonstrate how knowledge gained from other content areas affects the development of technological products and systems.

Activity 3.2.b: Building a Shed (Complete Insulated Construction Project Kit)

Technology and Engineering

3.5.6-8.W (ETS) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

3.5.6-8.BB Demonstrate how knowledge gained from other content areas affects the development of technological products and systems.

Project 3.3: Why Insulate?

Technology and Engineering

3.5.6-8.M (ETS) Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

3.5.6-8.N (ETS) Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

3.5.6-8.P (ETS) Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

3.5.6-8.W (ETS) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

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Problem 3.4: Shipping Container Home

Optional Problem 3.4: Tiny House

Environmental Literacy and Sustainability

3.4.6-8.H Design a solution to an environmental issue in which individuals and societies can engage as stewards of the environment.

Technology and Engineering

3.5.6-8.M (ETS) Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

3.5.6-8.N (ETS) Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

3.5.6-8.P (ETS) Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

3.5.6-8.Q Apply a technology and engineering design thinking process.

3.5.6-8.U Evaluate and assess the strengths and weaknesses of various design solutions given established principles and elements of design.

3.5.6-8.V Refine design solutions to address criteria and constraints.

3.5.6-8.W (ETS) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

3.5.6-8.X Defend decisions related to a design problem.

3.5.6-8.BB Demonstrate how knowledge gained from other content areas affects the development of technological products and systems.

3.5.6-8.JJ Apply informed problem-solving strategies to the improvement of existing devices or processes or the development of new approaches.