

Unit 3 Commercial Applications, Lesson 3.1

Commercial Building Systems Lesson Plan

COURSE:

Civil Engineering and Architecture (Honors)

TEACHER:

Jason D. Redd

DURATION:

13 Days

STANDARDS:

This course connects to standards in the following:

- Common Core State Standards for English Language Arts Anchor Standards

- Common Core Standards for Mathematics

- Common Core English Language Arts Standards

- Next Generation Science Standards

- Standards for Technological and Engineering Literacy

Use technical documents to communicate effectively using accepted engineering practices.

Understandings

Students will understand that:

Commercial building systems differ from residential building systems in many significant ways.

Codes and building regulations define and constrain all aspects of building design and construction including the structure, site design, utilities, and building usage.

Zoning regulations are used to control land use and development.

Wall, roof, floor, and framing systems for commercial facilities are chosen based on many factors.

Knowledge and Skills

Knowledge: Students will:

Identify typical commercial wall systems/materials and differentiate between load-bearing and non-load bearing walls.

Identify common commercial building framing systems.

Identify the pros and cons to the use of a green roof in a commercial building design.

Identify the types of requirements that pertain to site development and are typically included in Land Use Regulations.

Identify typical commercial roofing systems and differentiate between roofing materials appropriate for pitched roofs and roofing materials appropriate for low-slope roofs.

Skills: Students will:

Identify applicable building codes and regulations that apply to a given development.

Classify a building according to its use, occupancy, and construction type using the International Building Code.

Research Land Use regulations to identify zoning designations and allowable uses of property.

Comply with specifications, regulations, and codes during a design process.

Compare a variety of commercial wall systems and select an appropriate system for a given commercial application based on materials, strength, aesthetics, durability, and cost.

Compare a variety of commercial low-slope roof systems and select an appropriate system for a given commercial application based on materials, strength, durability, and cost.

Incorporate sustainable building practices, especially a green roof, into the design of a commercial building.

Use 3D architectural design software to incorporate revisions for the redesign of a building.

Use 3D architectural design software to create appropriate documentation to communicate a commercial building design.

Calculate the structural efficiency of a structure.

Use load-span tables to design structural elements.

ESSENTIAL QUESTIONS:

Students will keep considering:

What is the difference between land use regulations and building code requirements?

How do land development regulations help or hinder development in a community?

Fill in the blanks to describe the overall difference between residential construction and commercial construction: _____ versus _____. Support your answer with specific examples of construction practices.

Are building code requirements too strict to allow creativity and unconventional design solutions?

Guided Practice

The teacher will:

Review agenda, learning objectives, and essential questions daily.

Lead students to recall prior knowledge / experience to make connections to new content.

Introduce content to be learned.

Clarify and check for understanding by asking open-ended questions (or by some other type of formative assessment) throughout instruction. Reteach material as needed.

Pace the classroom instruction to clarify misunderstanding and provide opportunities for student feedback.

Introduce new content to be learned and how it connects to learning objectives and answers some (or all) of the essential questions.

Demonstrate skill practices students will gain from this lesson.

Demonstrate assignment(s) outcome expectations.

Review resources and equipment needed to problem-solve student assignments.

Share safety instructions to students. *Safety Instructions: Students should only utilize equipment they have been fully trained to use.*

Provide review material / resources for students to prepare for summative assessments.

Transition

Classroom Expectations / Routines

Review Questioning

Stimulus or Signal (Example: etc.)

Student Reflection

Timer

Independent Practice (Varied Learning)

The students will:

Participate in teacher-led discussions / presentations.

Complete assigned assignment(s) in class.

Complete *Project 3.1.5 Structural Efficiency*.
Complete the *Project 3.1.5 Structural Efficiency Report*.
Complete *Activity 3.1.6 Commercial Floor Systems*.
Complete the *Lesson 3.1 Test*.

Homework

The students will:

- Complete assignments that were not completed in class.
- Conduct research as needed for assignments.
- Review the lesson/unit concepts, content, and skills as needed to prepare for lesson/unit assessments.

ASSESSMENTS:

Checks for Understanding (Formative and/or Summative):

- | | |
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| <input checked="" type="checkbox"/> Bell Ringer(s) | <input checked="" type="checkbox"/> Peer Evaluation / Reflection |
| <input checked="" type="checkbox"/> Check Class Assignment(s) / Homework | <input type="checkbox"/> Performance-Based (Skills) Assessment |
| <input checked="" type="checkbox"/> Class Participation | <input checked="" type="checkbox"/> Project / Presentation |
| <input type="checkbox"/> Group Activity | <input checked="" type="checkbox"/> Student Reflection |
| <input checked="" type="checkbox"/> Hands On / Lab Activity | <input checked="" type="checkbox"/> Teacher Observation |
| <input checked="" type="checkbox"/> Independent Practice | <input checked="" type="checkbox"/> Test / Quiz |
| <input type="checkbox"/> Interview | <input type="checkbox"/> Other: |
| <input checked="" type="checkbox"/> Oral Responses | |

TEACHER REFLECTION / ADDITIONAL NOTES:
