

Unit 3 Commercial Applications, Lesson 3.4 Site Consideration Lesson Plan

COURSE:

Civil Engineering and Architecture (Honors)

TEACHER:

Jason D. Redd

DURATION:

15 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

PLTW FRAMEWORK:

Provided by Project Lead the Way (PLTW), the PLTW Framework provides an overview of the levels of understanding that each student will build upon throughout the lesson/unit. It includes: Established Goals, Transfer, Understandings, Knowledge and Skills, and Essential Questions. The most fundamental level of learning is defined by course Knowledge and Skills statements. Each Knowledge and Skills statement reflects specifically what students will know and be able to do after they've had the opportunity to learn the course content. Students apply Knowledge and Skills to achieve Learning Objectives, which are skills that directly relate to the workplace or applied academic settings.

Established Goals

It is expected that students will:

- Demonstrate an ability to identify, formulate, and solve engineering problems.
- Demonstrate an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- Demonstrate an ability to design and conduct experiments, as well as to analyze and interpret data.
- Demonstrate an ability to apply knowledge of mathematics, science, and engineering.
- Demonstrate an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- Pursue the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- Demonstrate an understanding of professional and ethical responsibility.
- Demonstrate an ability to function on multidisciplinary teams.
- Demonstrate an ability to communicate effectively.
- Gain knowledge of contemporary issues.

Use current engineering tools (ex., surveying equipment, soil testing equipment, CADD software) in problem solving and engineering design.

Understandings

Students will understand that:

Land surveying is used for many purposes during the design and construction of a project, including establishing the topography of a site, setting control points, and establishing the location of project features.

Engineers must consider parking requirements, pedestrian access, ingress and egress, landscaping, storm water management, and site grading when creating a site design.

Ingress and egress, parking, pedestrian, and handicapped access must be planned to efficiently and safely move traffic, goods, and people.

Codes determine the type, sizing, and placement of site features such as parking lots, entrance and exit roads, pedestrian and handicapped access, and storm water facilities.

A soil can be classified according to its grain size and plasticity, two factors that impact the characteristics the soil will exhibit.

The characteristics of soils present on a site will impact the design and construction of improvements to a property.

The surface conditions and topography of a site affect the quantity and quality of storm water runoff and the design of the storm water management system.

Knowledge and Skills

Knowledge: Students will:

Explain the impact of site development on storm water runoff.

Identify and explain the purpose of the use of Low Impact Development techniques in site development.

Skills: Students will:

Use differential leveling to complete a control survey to establish a point of known elevation for a project.

Design appropriate pedestrian access, vehicular access, and a parking lot for a commercial facility.

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.

Complete *Activity 3.4.2 Parking Lot Design*.
Complete *Activity 3.4.3 Soil Testing*.
Complete *Activity 3.4.4 Web Soil Survey*.
Complete *Activity 3.4.5 Storm Water Management*.
Complete *Activity 3.4.6 Landscaping*.
Complete *Activity 3.4.7 Cut and Fill*.
Complete *Activity 3.4.7A Hillside Cut and Fill Drawings*.
Complete *Activity 3.4.8 Road Design*.
Complete *Activity 3.4.8A Road Chart*.
Complete the *Lesson 3.4 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):

- Bell Ringer(s)
- Check Class Assignment(s) / Homework
- Class Participation
- Group Activity
- Hands On / Lab Activity
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