

# Unit 2 Materials and Structures, Lesson 2.1 Statics Lesson Plan

**COURSE:**

Principles Of Engineering (Honors)

**TEACHER:**

Jason D. Redd

**DURATION:**

14 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

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

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 co G[obal, )JTJETQt13(h a)4(nd sa)3(fe)7 62 5 s1 Tm0g02 62 2 reW\* nBT/F4 12 Tl3m



## **EQUIPMENT / MATERIALS / RESOURCES:**

Students will need or utilize:

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|--|--|
| <input checked="" type="checkbox"/> Assignment Handouts / Instructions | <input type="checkbox"/> Online Resources            |
| <input type="checkbox"/> CAD Software                                  | <input checked="" type="checkbox"/> Other Software   |
| <input checked="" type="checkbox"/> Classroom Materials / Equipment    | <input checked="" type="checkbox"/> Schoology        |
| <input checked="" type="checkbox"/> Computer / Device                  | <input checked="" type="checkbox"/> Teacher Handouts |
| <input checked="" type="checkbox"/> Internet Access                    | <input type="checkbox"/> Other:                      |
| <input checked="" type="checkbox"/> Microsoft Office Software          |  |

## **AGENDA / ACTIVITIES / INSTRUCTIONAL PROCEDURES:**

### **Teacher Activity (Introduction to New Material)**

The teacher will:

- Review the Learning Objectives and Essential Questions for the lesson (at the beginning and throughout).
- Lead a class discussion about the Learning Objectives and Essential Questions for the lesson.
- Provide an overview of assignments that will be worked on throughout the lesson.
- Demonstrate expectations / skills.
- Provide access to the PowerPoint presentation called Introduction to Statics
- Provide access to the PowerPoint presentation called Centroids
- Provide instructions for *Activity 2.1.1 Centroids*.
- Provide access to the PowerPoint presentation called Introduction to Structural Member Properties
- Provide instructions for *Activity 2.1.2 Beam Deflection*.
- Provide access to the PowerPoint presentation called Free Body Diagrams
- Provide instructions for *Activity 2.1.3 Free Body Diagrams*.
- Provide access to the PowerPoint presentation called Force Vectors
- Provide instructions for *Activity 2.1.4 Calculating Force Vectors*.
- Provide access to the PowerPoint presentation called Moments
- Provide instructions for *Activity 2.1.5 Calculating Moments*.
- Provide access to the PowerPoint presentation called Calculating Truss Forces
- Provide access to the PowerPoint presentation called Steps to Calculating Truss Forces
- Provide instructions for *Activity 2.1.6 Step-By-Step Truss System*.
- Provide instructions for *Activity 2.1.7 Calculating Truss Forces*.
- Provide instructions for *Project 2.1.8 Truss Design (SSA)*.
- Provide access to the *Project 2.1.8 Truss Design (SSA) Resources*.
- Provide access to the *Project 2.1.8 Truss Design (SSA) Handout*.
- Assess student presentations/work.
- Provide instructions for the *Lesson 2.1 Test*.

### **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.



## **ASSESSMENTS:**