

Lesson Properties

Course: Principles of Applied Engineering

Start Date:

Completion Target:

Unit: Introduction to Structural Engineering

October 26, 2017

December 8, 2017

Teacher: Rick Ortiz

STAGE 1 – Instructional Target

Learning Objectives / Goals

- Ss will understand the way physical systems function by utilizing virtual simulation tools to design, prototype, and evaluate a structural system.
- Ss will define and understand the different types of stress: compression, tension, torsion, shear.
- Ss will apply knowledge of structural engineering principles to a real world design problem.
- Ss will use CAD tools to develop a challenge solution in preparation for physical prototyping.

Standards Addressed

§130.402.c. 1.B, 1.C, 1.D, 5.A, 6.C, 6.D, 9.D

Cross-Curricular Connections

§112.39.c.4.D, 4.E (Physics, Free Body Diagrams)

STAGE 2 – Assessment

Performance Tasks

- Ss will complete assessment activities in the WhiteBox Learning system.
 - Truss Stability Lab; Linear Forces Lab; Nonlinear Forces Lab; External Forces Lab; Free Body Diagrams Lab
- Ss will work in virtual simulation environment to conduct a cost analysis of materials and other factors when designing a bridge.
- Ss will develop a solution to the design challenge and evaluate the feasibility of their design in a virtual simulation environment.

Secondary Evidence

- T will conduct informal observation and document findings in Observation Checklist.
- Ss will document their progress using digital engineering journals.
- Ss will conduct peer-evaluations to document the engineering team dynamic.
- **Extention:** Ss can apply leaned principles Structural Engineering and Design TSA competition.

STAGE 3 – Lesson Delivery

Instructional Strategies

Direct Instruction, Modeling, Self-Paced Assignments, Virtual Learning Environment, Blended Learning

Differentiated Instruction Supports

- Provide accommodations/ modifications to Ss in accordance with IEP/ (SpEd.)
- Front-load instructional materials on virtual learning platform. (LEP)
- Provide online translation tools as needed. (LEP)
- Provide visual aides, graphic organizers, etc. as needed.

Instructional Materials

WhiteBox Learning System, Student Workstations, Internet Connectivity