Global Earthquake Engineering: A STEM EDA Lesson and Activity (Curriculum Exchange)

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Dr. Krystal Corbett is the Director of Curricula at the Cyber Innovation Center (CIC). She received her B.S. and M.S. in Mechanical Engineering (2008/2010), M.S. in Mathematics (2012), and Ph.D. in Engineering Education (2012) at Louisiana Tech University. Through the CIC, Dr. Corbett manages various educational enterprises. Additionally, she is designing and implementing a three-part middle school elective course, STEM: Explore, Discover, Apply, which fosters excitement in STEM.
Course Summary

The Apply Earthquakes curriculum module is part of STEM: Explore, Discover, Apply (EDA), a three course elective sequence for middle school grades 6-8; each module typically lasts three weeks. In Apply Earthquakes, 8th grade students perform global earthquake engineering activities that address community needs. The Engineering Design Process (EDP) guides the students through the design and implementation of projects and concepts related to earthquake design. The end result is that students build a model structure using various materials such as balsa wood, cotton balls, and craft sticks to withstand earthquakes simulated by a shake table.

Target Grade Level(s)
Apply - 8th grade

Module Overview

As members of EWB-USA, you have traveled to a third world country to help with the reconstruction of homes there after a devastating earthquake. As a global engineer, you must consider the earthquake resistant designs, as well as the needs of the community.

Research these three main areas: consider the needs of the community, the geographic area of the region, and historical and real-time earthquakes.

Develop three ideas broken down by the following: materials and price, design description, and overall design.

Use the following four categories to assess and rate each design: Design Strengths, Design Weaknesses, Incorporated Design Research, and Shake Table Survival.

Build a prototype for the design chosen in Step 4 and utilize the iterative nature of design.

Test the prototype on the shake table and evaluate its performance.

Reflect on the performance of the prototype and suggest improvements and redesigns of the structure.

Course Implementation

Schools can implement the STEM EDA curriculum in a variety of ways: as an elective, after school program, or inserted into their existing classes.