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

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Joi-Lynn Mondisa is a doctoral candidate in the School of Engineering Education at Purdue University, West Lafayette, IN. Her research interests focus on examining how mentoring intervention programs promote the success of undergraduates in STEM majors and how mentoring assists in increasing the retention rates of underrepresented populations in STEM programs.

Ms. Krystal S Corbett, Cyber Innovation Center

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

Module Premise
Everyone in your group is a member of Engineers Without Borders USA (EWB-USA), a nonprofit humanitarian organization that implements sustainable engineering projects globally.

Featured Topics
- The history of earthquakes
- Topography and making topographic maps
- The Richter scale
- Earthquakes around the globe

Materials
- Balsa wood – Wood logs
- Straws – Piping material
- Popsicle sticks – Lumber beams
- Paper clips – Wire
- Cotton balls – Fiberglass insulation
- Hot glue gun – Cement sealer applicator
- Hot glue sticks – Cement sealer

Building Model Constraints/Rules
The teacher should set some constraints for building the structure regarding dimensions, testing, and total costs spent on materials.

Engineering Design Process
This process is used to guide students through the STEM EDA curriculum while encouraging teamwork, critical thinking, and creativity.

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.