



**Introduction to Seismic Structures
2025 NHERI Summer Institute Lesson Plan
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- **Subject:**
Seismic Activity & Structural Engineering
- **Associated Unit:**
Structural Engineering
- **Grade level:**
7th grade
- **Time required:**
2 days (1st part)
- **Summary:**
Students will learn about, discuss, and engage in a project that brings together principles of engineering concepts and natural disaster incidents.
- **Engineering Connection:**
This lesson will call upon prior engineering knowledge from class wherein students will watch video examples of seismic disasters and take notes. A class discussion will occur on how natural disasters affect our developed and natural environment around us.
- **Engineering Category:**
Structural engineering, environmental engineering **Keywords:** truss, tectonics, harmonics, etc.
- **Educational Standards:**
CTE based - §130.402 6A, 6B, 6D, 6E Science based - 6.7A, 6.7B, 6.7C, 7.7D
- **Learning Objectives:**
By the end of this unit, students will be able to accurately describe natural disasters that affect man-made structures and how said structures are limited in their survival potential.

- **Lesson Background:**
 On July 29, 2025, a magnitude 8.8 earthquake occurred off of the coast of Russia that sent epic tsunami type waves radiating away from its epicenter. This is the latest such occurrence but one that shows just how powerful the wrath and destruction can be if conditions are just so.
- **Vocabulary/Definitions:** truss Tectonics Harmonics Friction Gravity Motion Magnitude Net force Newton's First Law Newton's Third Law
- **Associated Activities:**
 This is the lead-in to the tower building unit for structural engineering. Students will be put into groups and challenged to build towers using knowledge of structural engineering principles and truss systems. Their towers will be built using balsa wood and construction glue and will be ultimately tested on a "shaker bed" to see how well they survive in a natural disaster.
- **Materials needed per group:** balsa wood, glue, cutters, etc.
- **Assessment:**
 Testing the bridge via the shaker table is the ultimate assessment model for this unit. There will be smaller formatives along the way that assess the status of student learning.