

Earthquake Towers

Grades 9+ | Students Served: 30 (teams of 2)

HIGH SCHOOL



Essential Questions

Why are we having so many earthquakes?

How should you prepare for an earthquake?

What needs to be considered in designing structures for areas that are prone to earthquakes?

Career Connections:

- Geophysicist
- Seismologist
- Meteorologist
- Civil Engineer

STEM Connections

Science

- Seismic forces
- Earth structure
- Resonance

Technology

- Design attributes
- Systems
- Historical perspectives

Engineering

- Logic/creativity in innovation
- Prototypes
- Technological design

Math

- Wave functions
- Scaling
- Logarithmic functions

Sample Activity

Tremors!

Challenge

Students design, construct, and test an earthquake-resistant road.

- Students design a segment of road that can withstand an earthquake. They determine the segment's dimensions and the material to be used as the roadbed.
- The road segment must be created from balsa wood strips 24" x 1/8" x 1/8" in size.
- The length of the segment must be between 12" and 18", width of the road must be 4", and height of the road must be between 2" and 4".
- A wood foundation must be used and placed in the center of the segment.
- Floor plates may be used and cross braces are allowed.
- A roadbed must be included and be at least 1/4" thick.
- Students construct the road segment and glue the foundation block to a tower base block. Allow the glue and the roadbed to dry overnight.
- Test the road segment using the EQS Tremor Table. Start with a low frequency and gradually increase the frequency. Be sure students record each frequency and their observations.

Discussion

Describe what you observed as you increased the frequency. Describe any weaknesses of the design and suggest how to strengthen the design.

