



SfS Away from the Classroom!

SCIENCE
FROM SCIENTISTS

E07: Earthquake Resistant Buildings (Recommended for Grades 3-8)

Please use the following resources to learn about the engineering process and earthquakes!

Watch this Video: <https://www.youtube.com/watch?v=7hoSqazNmfY>

Answer these questions:

- How does a shaking table work?
- What information can engineers learn from testing structures with a shake table?
- What design solution have engineers learned from using shake table tests?
- How have engineers improved earthquake safety at San Francisco's City Hall and SFO International airports?

Activity: Follow these directions to create a shake table to test different building designs.

You will need:

<ul style="list-style-type: none"> • 2 sponge cut into 1in x 1in squares (about 20) • Binder you don't mind cutting 	<ul style="list-style-type: none"> • 4-8 sm balls of equal size • 2 large rubber bands • 4x6 plastic container 	<ul style="list-style-type: none"> • Marbles • Box of toothpicks • Scissors
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(*note that the sponges in the instructions can be replaced with mini marshmallows.)

Build the shake table.

1. With an adult's help, use the scissors to remove the binding of the binder so that you have just the front and back covers.
2. Put the covers together, flat sides facing each other, and wrap the rubber bands around them.
3. Put one ball in each corner, in between the covers. If the covers are very bendy, add 2-4 more balls along the sides and middle.

Construct the building.

1. Make a building out of sponge pieces and toothpicks. (Think about what would make your model most stable!)

Create an earthquake.

1. Place your building on the shake table and shake the top binder cover gently. Does your building withstand an earthquake!
2. Next, try using the marbles in the shallow tray as a base isolation system for your building.
3. Did base isolation make your building more earthquake-resistant?



Make observations & use Claims, Evidence, and Reasoning!

- Claim:** Engineers should build a model of a building in order to test its stability in an earthquake
 - **Evidence:**

 - **Reasoning:**

- Claim:** The most stable building design I tested was _____ (describe shape/design)
 - **Evidence:**

 - **Reasoning:**