Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Making Earthquake-safe Buildings

**Purpose**

Evaluate strategies for making buildings earthquake-safe.[[1]](#endnote-2)

**Procedure**

 **Materials**

1. Thin pieces of cardboard (7)
2. Sugar cubes
3. Peanut butter, frosting, or double sided tape
4. Small pieces of window screen (4)

**Sequence of Steps**

1. Construct a model of a one-story brick building using two thin pieces of cardboard as the floor and roof. Use sugar cubes as bricks and peanut butter, frosting or double sided tape to hold the bricks together.
2. ![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()Construct a second building. Make this building a two-story structure.
3. ![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()To test how well your buildings stand up to a simulated earthquake, place the one story building on a table or desk. Then either drop a large book on the table next to it, or gently shake the edge of the table. Record your observations.
4. Repeat step 3 with the two-story model building. Record your observations.
5. ![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()Construct a third building using small pieces of window screen as reinforcement. This building should be a one-story structure. Spread a thin layer of peanut butter or frosting on the inside of the walls and carefully attach pieces of screen to each of the inside walls. Use extra peanut butter or frosting to reinforce the inside corners.
6. Repeat step 3 with the reinforced building. Record your observations.

**![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]() Observations**

1. What happened to each building during the simulated earthquakes?

|  |  |  |
| --- | --- | --- |
| Single-story, no reinforcement | Two-story, no reinforcement | Single-story, reinforced |
|  |  |  |

1. Compare the amount of earth quake damage in the three model buildings. What conclusions can you make?
2. What causes earthquakes? Explain using complete sentences.
3. Agriculture Application: Earthquakes are a natural hazard in California, and buildings, including agricultural buildings, must be earthquake safe. Agriculture Engineers study how to make structures functional for agriculture production, and safe amidst California’s natural hazards. Brainstorm at least 3 agricultural structures which must be made earth-quake safe and write them below. Include the purpose, or function, of the structure as well.

*Ex. Large Greenhouse: Purpose – Protect plants and keep them warm so that they grow quickly.*

a.

b.

c.

1. Tarbuck, E, & Lutgens, F (2009). *Earth Science*. Boston, MA: Prentice Hall. [↑](#endnote-ref-2)