Earthquake at Home

How do engineers design and construct buildings to withstand earthquake damage? Get ready to put your hard hats on because today you will become an engineer and learn how to build your own model structure using toothpicks and marshmallows. Experiment to see how earthquake-proof your buildings with limited resources.

Materials:

- 30 toothpicks
- 30 marshmallows
- Table
- Pencil/pen
- Paper

Learning objectives:

- Identify factors that make buildings earthquake-proof
- Model and earthquake-proof structure
- Understand why engineers need to learn about earthquakes

Time required: 20-45 minutes

Context:

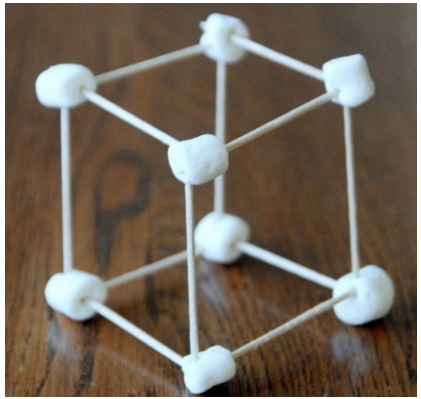
For this challenge, you are limited to using only the materials you have on hand to make the structures. You can make large or small cubes or triangles using full-size or broken toothpicks. You can also use cross-bracing to reinforce your structures.

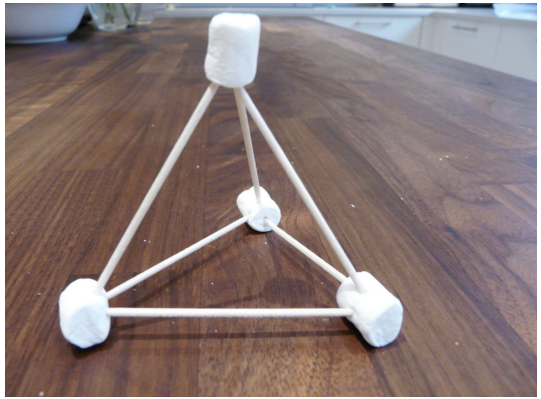
Here is an example of a building reinforced with cross-bracing. (Hint: X marks the spot)

To make it more challenging, try to meet one (or more) of the following rules or create your own. Buildings must...

Context:

Below are examples of a structure made with squares and triangles.





Activity:

1. Draw 1 (or more) concept structures on paper.

2. Build. With the rules in mind, build your structures.

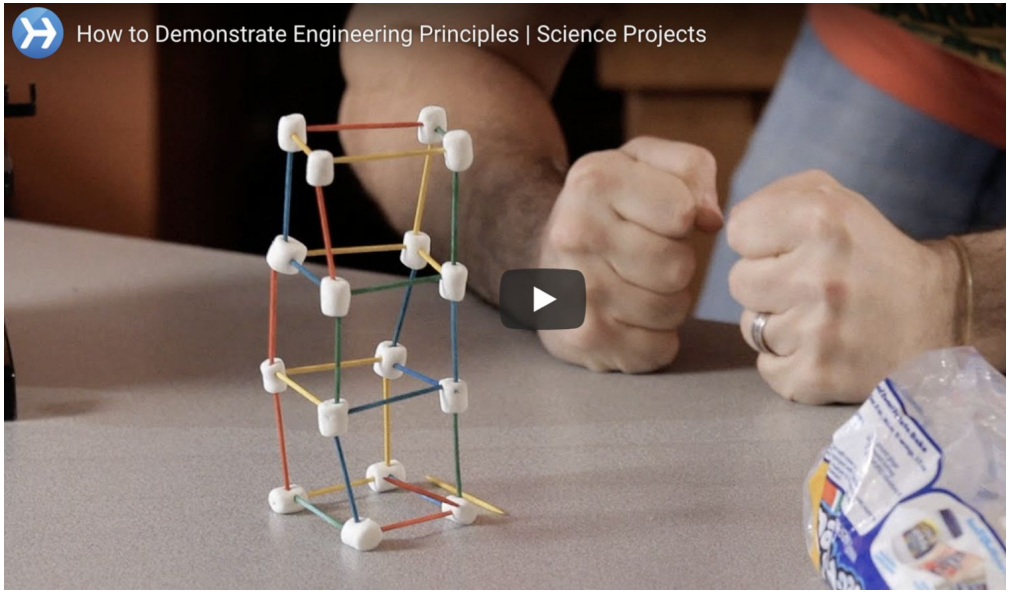
3. Test. When your structure is ready, place it on the table and shake (or pound) the table quickly to simulate an earthquake.

4. If your building toppled, build another structure and try again. How high can you make your earthquake-proof building?

5. Share your photo story with us and see what other kids have created by posting to #MadeToHack.

Context:

If you have any questions, here's a video for this activity:



Reflection:

Why did your building topple?

What would help to make the structure taller or shorter?

What can you do to make the structure stronger?

Would it help to make the base (or bottom) bigger?

Happy Making!

-Team Hack