

SHAKY STRUCTURES

Earthquake Resistant Buildings

When an earthquake occurs near a town or city it can cause lots of damage. In areas where there are lots of earthquakes, engineers must design earthquake-proof buildings which sway with the motion of the earthquake, rather than cracking and breaking. But what kind of structures do you think make good earthquake-proof buildings?

In this experiment you can make some earthquake-proof buildings of your own, using cocktail sticks and marshmallows. Give them a shake on some wobbly jelly to simulate an earthquake, and see how well they hold up!

What you'll need:

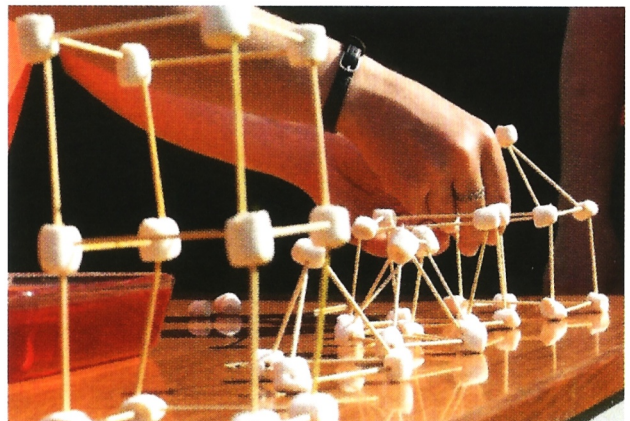
- A deep pyrex dish or baking tray approximately A4 size
- A pack of jelly
- Some cocktail sticks
- A bag of mini marshmallows (fresh squishy ones)



Instructions

Make your jelly "ground" the night before by pouring it into a dish and leaving it to set overnight.

Next make some 3D structures using cocktail sticks and joining them together using marshmallows.

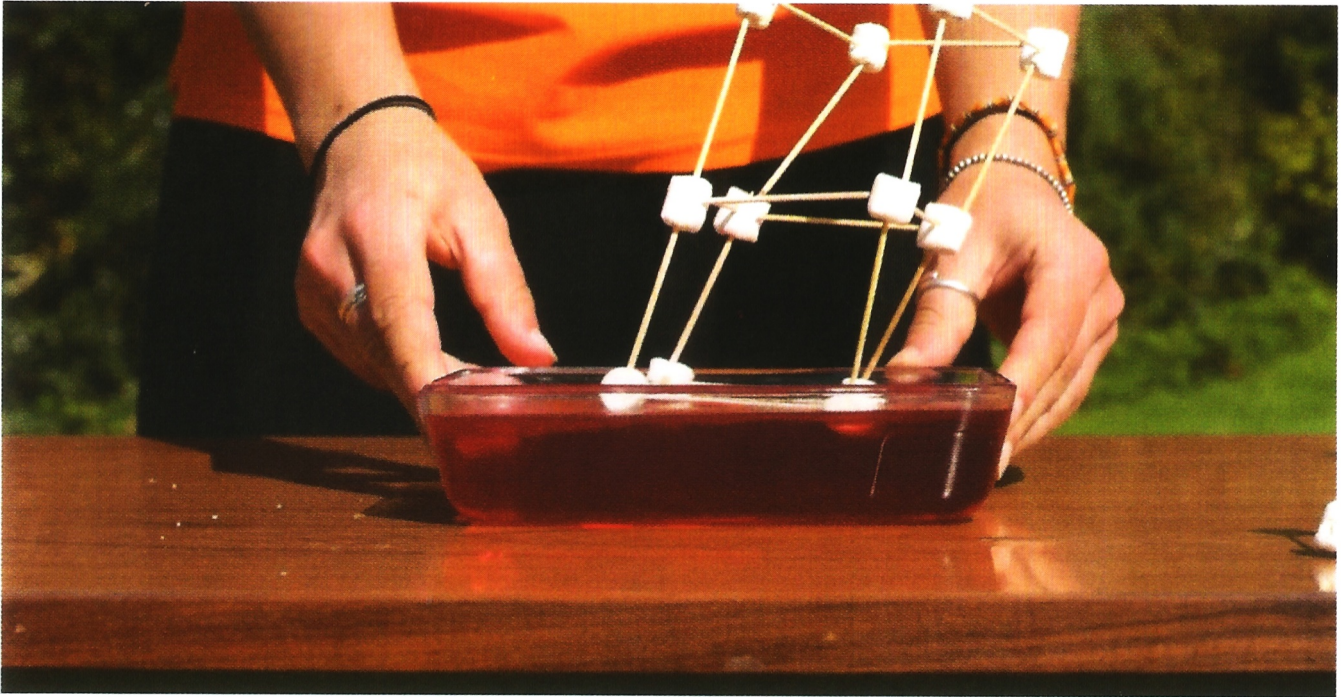


Place your structures on the jelly and slide your tray from side to side to simulate an "earthquake". How well do your structures stand up?

Are tall buildings, or short buildings better? What kind of shapes are strongest? Try making some cubes or pyramids – which work best?

What's happening?

You should find that short buildings are much more stable than tall buildings. This is because even though short and tall buildings shake at the same rate the shaking motion is magnified as buildings get taller. The strongest structures are often pyramids or tapered shapes which are wider at the bottom and get thinner towards the top. Triangles are very strong shapes and you can often make other shapes like cubes stronger by adding cross-bracing to form triangles.



FACT

Engineers use lots of other clever tricks to try and stop tall buildings like sky scrapers from shaking too much, including giant pendulums and detached bases.

KEY POINTS

- We can protect ourselves from earthquakes by designing earthquake resistant buildings
- Short buildings are less affected by earthquakes than tall buildings
- Tapered shapes and cross bracing improve resistance to shaking

INFO FOR INTERESTED ADULTS

How do you make tall buildings earthquake-proof?



UNIVERSITY OF
CAMBRIDGE

OCR
Oxford Cambridge and RSA