



Spaghetti skyscrapers

A do-at-home civil engineering activity for ages 4-18.

E: careers@ice.org.uk W: ice.org.uk/wice

Spaghetti skyscrapers

Tall buildings can be a marker of a famous city – from the CN tower in Toronto Canada, to the Shard in London – these impressive structures define the skyline of world-leading cities.

These tall structures are only possible because of the work of civil engineers who design these massive structures to be able to withstand high winds and earthquakes.

Civil engineers use lots of different materials to build tall towers, these materials need to be strong enough to hold up the weight of the tower but also flexible enough that it can move very slightly in the wind – did you know that the top of the shard can wobble around 15cm in high winds?!

The most commonly used material for building high towers because it is both strong and flexible is steel. We obviously can't use steel beams in our activity but we can use spaghetti which has similar properties.

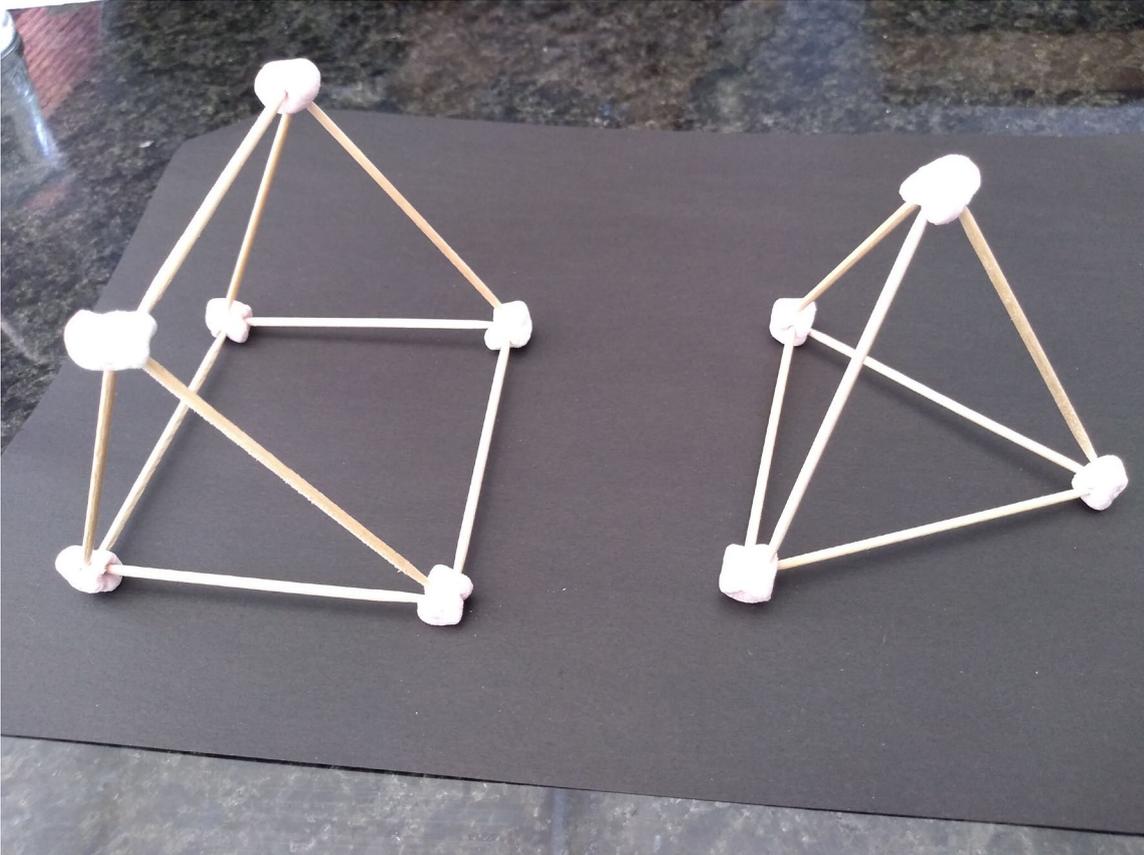
Your challenge is to build a 1m tall tower using uncooked spaghetti and marshmallows.

What you'll need

- Spaghetti (uncooked)
- Marshmallows (if you don't have these you could use Plasticine or Playdoh)
- A bike light (or small torch)
- A rigid tape measure (if you don't have one measure and cut a piece of string with a ruler)
- Elastic bands

Activity instructions

Start off by experimenting by making different shapes, using the spaghetti to pierce the marshmallows and join up with other sticks of spaghetti.



You can break the sticks of spaghetti into different sizes to try different shapes. **Top tip: triangles are a very strong shape that civil engineers use when building bridges and towers.**

Once you have had a bit of time playing with different shapes you should now plan out how you are going to make your tower by drawing a diagram on a sheet of paper, civil engineers make sure they plan everything out in detail before starting to build anything to make sure they know what they are doing.

Once your planning is done, it's time to start building so clear a space (making sure all members of the household are taking care around your construction so dogs and cats might need to be shut out of the room for this activity!) and see if you can build your tower 1m high.

When you reach this height it's time to add a final important feature. Buildings like the shard are so tall that they need to have special flashing lights on them so that aircraft can see them and make sure they don't fly into them. Use elastic bands to attach a flashing bike light to the top of our tower – this will be a test to see how strong your tower really is!

Once you are done turn on the bike light and turn out the room lights or pull the curtain and see your tower flash!

For 11-16 year old's

Your goal is to build a tower 150cm tall. You will have to think carefully about how to support your tower, especially lower down, so it is strong and stable enough to get to that height.

For 16-18 year olds



Can you build a spaghetti Westminster Clock Tower or a famous structure from your region? Check out some of the amazing structures people have built on google images if you need inspiration.

Proud of your work? Tweet us your spaghetti structure photos at twitter.com/ICE_schools

Tell us what you thought!

Email us at careers@ice.org.uk or write a comment or post on the [ICE@schools](https://twitter.com/ICE@schools) Twitter.

More resources on civil engineering

Careers advice for becoming a civil engineer: [ice.org.uk/beacivilengineer](https://www.ice.org.uk/beacivilengineer)

Careers and activity resources on our website: [ice.org.uk/educationresources](https://www.ice.org.uk/educationresources)

Civil engineering project case studies: [ice.org.uk/what-is-civil-engineering/what-do-civil-engineers-do](https://www.ice.org.uk/what-is-civil-engineering/what-do-civil-engineers-do)

Civil engineer (people) case studies: [ice.org.uk/what-is-civil-engineering/who-are-civil-engineers](https://www.ice.org.uk/what-is-civil-engineering/who-are-civil-engineers)

Info about all types of engineering careers (not just civil): Tomorrow's Engineers
tomorrowsengineers.org.uk