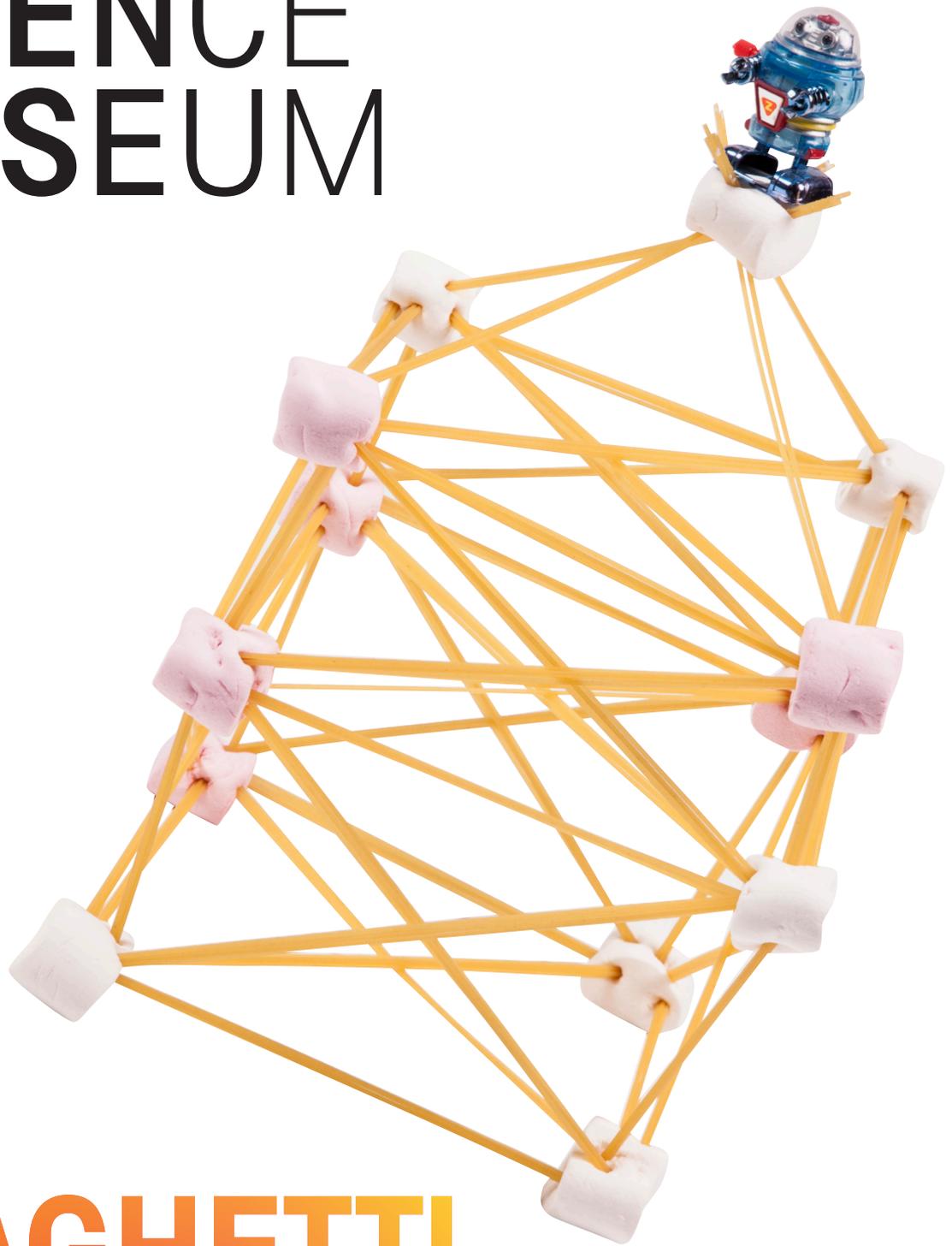


# SCIENCE MUSEUM



## SPAGHETTI STRUCTURES

MAKING



Age

7-11

Topic

ENGINEERING

🕒 30 MIN

Skills used

CREATIVE PROBLEM-SOLVING • TEAMWORK

# Overview for adults

Engineers put pure scientific knowledge into practice – but their jobs often involve practical testing, problem-solving and teamwork too. This activity calls all of these skills into action, to help build a tall, strong tower using spaghetti and marshmallows.\*

## What's the science?

One piece of spaghetti is not very strong. But if you use lots of pieces you can build a strong, tall tower. Each piece takes a little of the weight – of the tower and of whatever you place on top. The weight is the result of gravity, which pulls everything vertically downwards. That's why it's important to ensure that the tower doesn't lean too much – and that's also why towers are normally thick at the base and thinner at the top.

## Science in your world

Electricity pylons, church spires and structures such as the Eiffel Tower are all wider at the bottom than they are at the top to make them stable. Radio masts are among the tallest towers, and although most of them are actually the same width all the way up, they have cables anchored into the ground to stop them toppling over.

## Museum links

There are many strong structures around the Science Museum. Take a look at the model of the Forth Bridge in the *Making the Modern World* gallery.

Experiment with building other strong structures in *Wonderlab: The Equinor Gallery*.

## Did you know...?

The tallest tower in Britain is the radio mast at the Skelton transmitting station in Cumbria. It stands 365 metres high – the same as a tower of 78 double-decker buses.

**\*NOTE:** This activity can get messy. Have some cleaning materials and black bin bags available for clearing up afterwards.

## You will need...



Uncooked spaghetti



Marshmallows

**Top tip:** This activity can get messy. Have some cleaning materials and black bin bags available for clearing up afterwards.

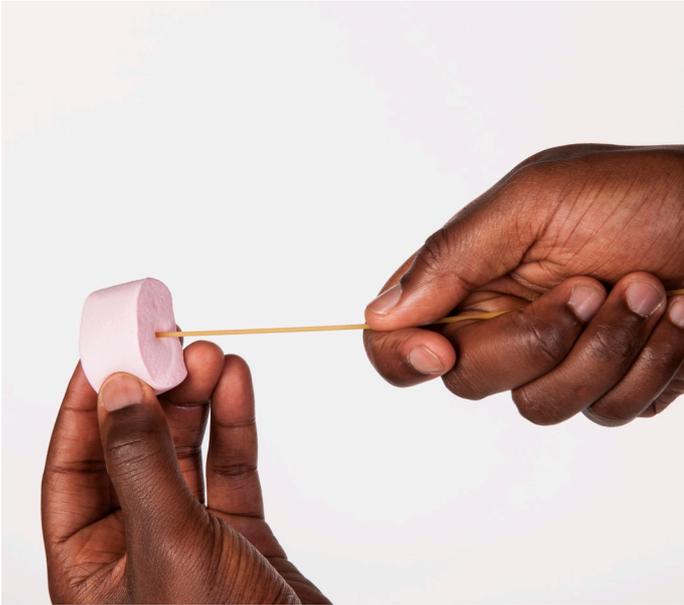
## Think and talk about...

- What shapes can you identify in your tower?
- What challenges did you have while you were building your tower?
- What do you think engineers have to consider when they are building structures?

## Investigate...

- Can you make a strong tower using only right angles between your pieces of spaghetti?
- Try to make your tower stronger by adding or replacing parts with different materials.
- See if you can make a bridge across a gap with the spaghetti and marshmallows.

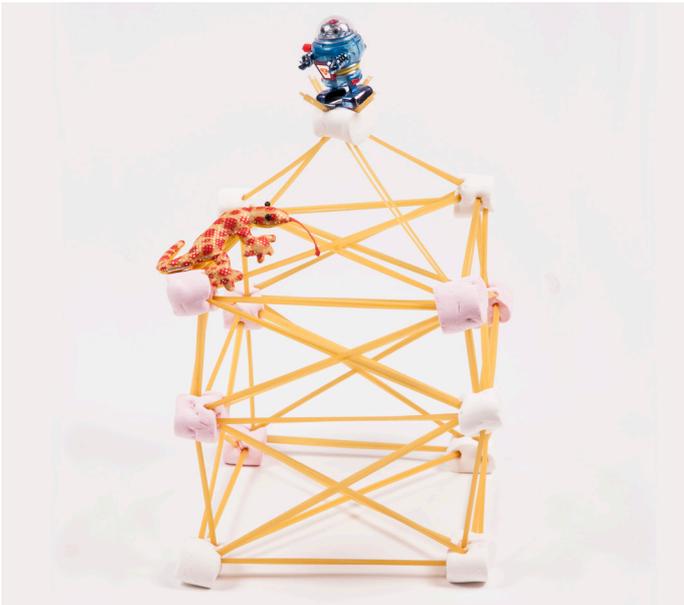
## Follow these steps...



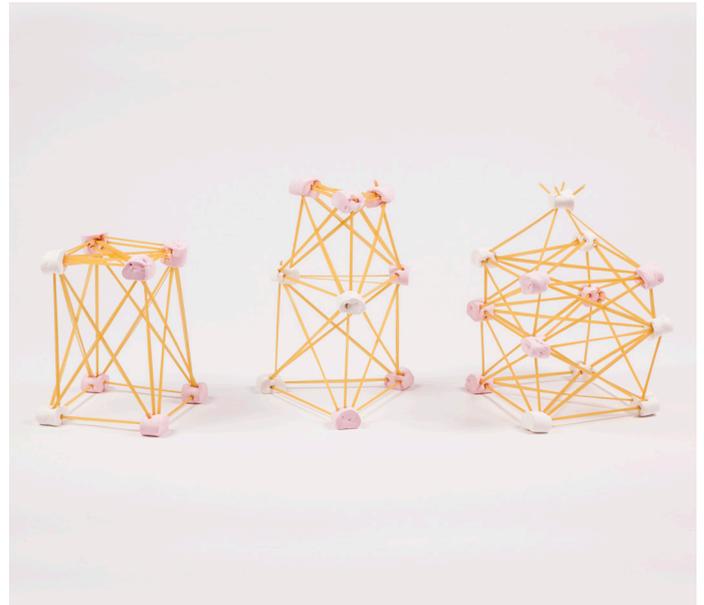
- 1** Start building your structure by pushing a piece of spaghetti deep inside a marshmallow.



- 2** Keep adding spaghetti and marshmallows to build a structure however you want. But remember that triangle shapes are very strong.



- 3** Test your structure's strength by balancing objects on top of it.



- 4** Try making structures that have different shapes, and see which one is strongest.

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## Science in your world

Free-standing towers such as the Eiffel Tower in Paris usually have wide bases and are thinner at the top, to stop them toppling over – just like your tower in the activity.

