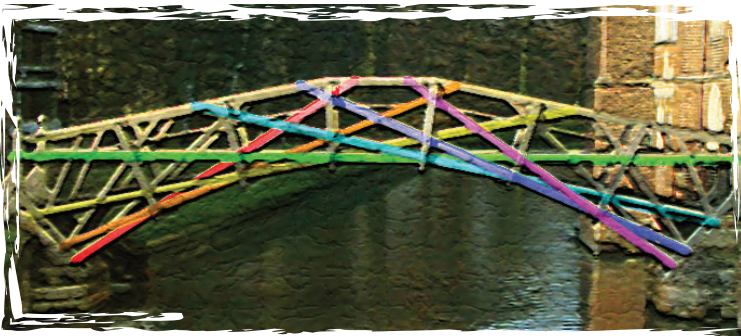


### What to do:

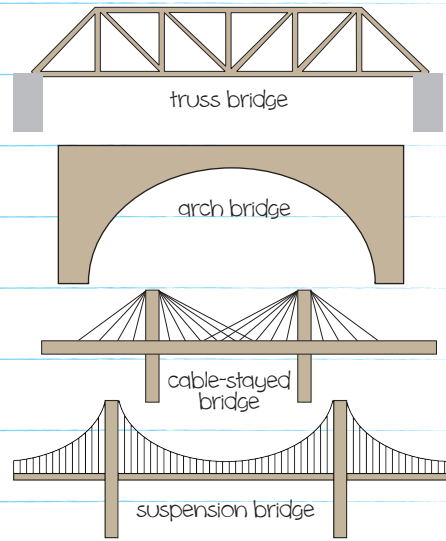
Build a bridge 50cm wide (span) to support the weight of a food tin in the middle of the bridge. Before you start, think about some designs that will give you a good engineered result and draw these. Some shapes are better at absorbing load - for example, triangles are particularly strong - so you might like to think about using them as part of your design. Also think about bunching straws together for added strength and make good use of the string, tape and elastic bands.

Things you'll need:

- drinking straws
- string
- tape
- elastic bands - various sizes
- a food tin



### some types of bridge



### How does it work?

Bridges support weights vertically and horizontally. The relationship between the tension (pull) and applied forces (push) is important as too much of either and your bridge will collapse or sag and buckle. Possibly the most important shape in engineering is the triangle. Unlike a rectangle, a triangle cannot be deformed without changing the length of one of its sides or breaking one of its joints. You can strengthen a rectangle by adding supports at the rectangle's corners - a single support between two diagonal corners greatly strengthens a rectangle by turning it into two triangles.

Did you know?



The Royal Engineers are the Army's specialist bridge-builders. One of their pieces of kit - the M3 Amphibious Rig - can be driven into a river, and when a number of them are joined together from bank to bank, they form a bridge strong enough to take vehicles as heavy as a Main Battle Tank. It takes eight M3s and 24 soldiers just 30 minutes to build a bridge 100 metres long!

### Time to Think:



- Why are some shapes stronger than others?
- How important are the materials used in building bridges?
- How could you use geometry to help you to work out the angles and lengths in any triangle?
- What can you find out about the mathematical bridge at Queens College, Cambridge (pictured above)?

