

Science Time



Experimenting at Home – Parent Resource

Bridges

To compliment this resource, watch the 'Experimenting at Home – Bridges' video online and read the 'Exploring with your Little Scientist Parent Resource' sheet.

Resources

- Things to make bridges (i.e. blocks, boxes, toilet rolls, cans, paper, cardboard, sticks)
- Weights (i.e. pebbles, blocks, small toys, cans, cars)

Safety

- Avoid using breakable objects

Getting started

Basic bridges

Bridges come in all shapes and sizes. To build a bridge you need supports on both sides and a flat bit across the middle. Can you make a bridge out of paper? Put a flat piece of paper on top of two supports. Is it strong enough to support a toy? Experiment with building bridges out of lots of different materials.



Experiment using strong shapes

Arches

How could you make your paper bridge stronger? Try using an arch shape. Put a paper arch between the two supports with a flat piece of paper on top. Is it strong enough to hold a toy? Will it support heavier toys?

Triangle zig-zags

Could you make your paper bridge even stronger? Try using triangle shapes. You can fold a piece of paper into a zig-zag shape (like a fan) to make lots of little triangles. Put your zig-zag paper underneath a flat piece of paper. Does it hold your heavier toys now?

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Cylinders

Experiment with your bridge design by using cylinder columns as supports. Cylinders are a very strong shape from end to end, so they make good weight bearing supports. Many things are cylinder shaped, such as cardboard tubes, cans, or rolled up paper.

Exploring further

Experimenting with bridge design

Encourage children to experiment with the design of their bridges.

Experiment with;

- **Materials:** change the materials you use on top and to support the bridge.
- **Bridge supports:** try moving the supports closer together or further apart. Experiment with using multiple supports for your bridges.

Test your different designs by measuring how many blocks or toys each design can hold. Discuss why some bridges hold more than others.

You may discover that children want to change many things at once, for example they may change the materials they use

and the distance between the supports at same time, but even if the bridge holds more weight we won't know if it was because of the materials used or the positioning of the supports. Let them make multiple changes and then discuss. To do a 'fair test' only one variable, e.g. material used, can be changed at a time. Encourage children to change one thing and see what happens.

Extra Challenges

Encourage children to use their understandings of bridges to attempt the following challenges;

- **Longest bridge:** How long can you make your bridge? Experiment with the materials you use as well as the number of supports you use to design the longest bridge you can. How many toys can your long bridge hold?
- **Strongest bridge:** How strong can you make your bridge? Experiment with your bridge design, the materials you use and the shapes that you use to design the strongest bridge you can. How many toys can your strong bridge hold? Experiment with putting heavier objects onto your bridge, such as blocks, cans or books etc. How much weight can your strongest bridge hold?