

SCIENCE MUSEUM GROUP



BOTTLE-TOP SHAPES

MAKING 	Age 5-7	Topic MATHS	 30 MIN
	Skills used CREATIVE PROBLEM-SOLVING • MAKING OBSERVATIONS • CURIOSITY		

Overview for adults

Shapes and patterns can be found all around us – from flowers to footballs, seashells to staircases. In this activity, simple lines drawn on bottle tops or jam jar lids provide a fun way into the wonderful world of geometry.

What's the science and maths?

Mathematicians define straight-sided two-dimensional shapes according to the number of sides they have, and also the angles at their corners, or 'vertices'. The number of sides is always equal to the number of vertices – so a square or a rectangle has four of each, while a triangle has three of each. If all a shape's angles are the same and all its sides are the same length, it is a 'regular' shape. All two-dimensional shapes with straight sides are called polygons; circles and ellipses (ovals) have curved sides, and are not polygons.

Science in your world

Architects, builders, designers and engineers make good use of all the basic shapes found in this activity to build structures and design products. Squares and rectangles fit together perfectly, or tessellate, making them great for paving slabs or tiles. Regular hexagons and some triangles also tessellate. Unlike squares, triangles are rigid because they cannot 'skew', making them ideal for building structures such as bridges and towers, which need to be very strong.

Did you know...?

A 50-pence coin has seven sides of equal length – so it's a regular heptagon.

Create your own shapes using bottle tops to investigate and learn about the wonderful world of geometry.

You will need...



Lots of bottle tops
or jam jar lids



Marker pens



White paint or
correction fluid

Think and talk about...

- Can you find any of the shapes that you've made in the room you're in?
- What are the similarities and differences between the shapes you made?
- Why do you think most doors and windows are normally rectangles?

Investigate...

- Try and make a shape with as many sides as possible. What's the biggest number of sides you can go up to?
- How many different shapes using right angles can you make?
- Can you link all of your bottle tops together into one shape?

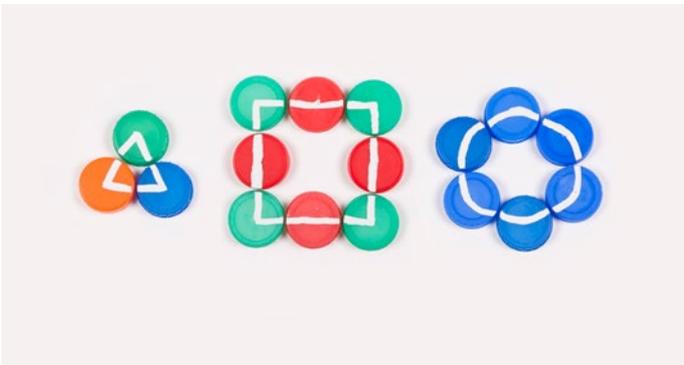
Follow these steps...



1 With your paint or marker pen draw some straight lines, right angles or curves onto the bottle tops.



2 Connect the different lines you've drawn to make shapes. Try making a rectangle.



3 What other shapes can you make?



4 Experiment with other shapes. Try using a mirror to investigate lines of symmetry.



5 Be creative – draw different lines on the bottle tops and see if you can link every bottle top together!

Science in your world

You'll find squares, rectangles, hexagons, triangles and circles everywhere in your everyday life – in buildings, cars, furniture and even in nature. Triangles are particularly useful in structures such as towers and bridges because they are very strong.

