

Möbius Strip

On SCOPE's Shapes episode, Julia explored the fascinating one-sided shape called a Möbius strip. Here's how you can do it at home:



What you need:

Paper
Scissors
Sticky tape

What to do:

1. Cut a piece of paper into a strip about 30cm x 3cm.
2. Make a half twist in the strip.
3. Form a loop but attaching the two ends with sticky tape to form a loop. Make sure you tape the entire length of the join.
4. Draw a line down the centre of the strip and don't stop till you reach the end of the paper.

Did you reach the end of the paper? No! You would have drawn a continuous line because the Möbius strip is a one sided shape! If you were to cut along that line, what do you think will happen to the Möbius strip?

5. Cut along the line to find out!

You might have thought two separate loops would be formed, but in fact, you should have ended up with one *long* loop with three twists in it!

6. This time, make a Möbius strip with *two* half twists in it and once again cut along the centre of the strip. What happened?
7. Experiment with different Möbius strips and see what shapes you can come up with! Try sticking two Möbius strips together, and cutting through both, or try sticking one Möbius strip and one non-twisted strip together!



What's happening?

A Möbius strip is a two-dimensional, one-sided shape which was discovered independently by two scientists, August Möbius and Johann Listing, in the 19th century.

Möbius strips are cool, but how are they actually useful? Well, machinery which uses rotating belts or straps often have them twisted into Möbius strips, because this makes the best use of the strip's surface and helps it last longer.

The Möbius strip is part of a branch of maths known as topology. Topologists study shapes, but they don't see shapes the same way we do! They look at deformed shapes and see what they have in common. For example, to a topologist, a circle is the same as a square or an octagon, because they are both single loops and can all be deformed into circles!