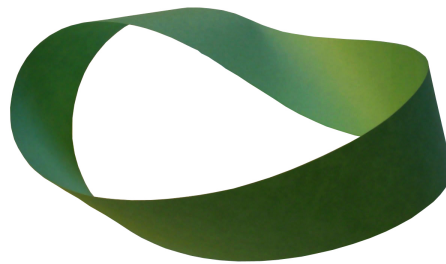




MOBIUS LOOPS

1) Make a mobius loop

Take a strip of paper. Get a strip of sellotape ready. Hold the strip as if you were going to make a normal loop but just before you join the ends together, turn over one end of the piece of paper. Then put sellotape along both sides of the join to hold the mobius loop together.

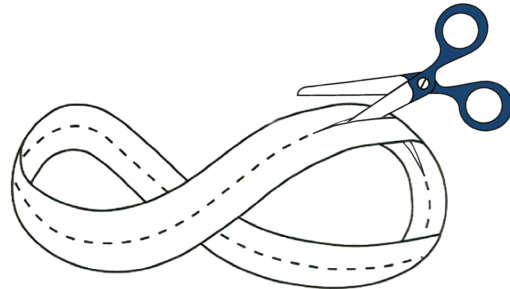


2) Draw on the scissor line

Start drawing a line down the centre of the mobius loop (as below), and keep going until you get back to where you started. Curiously, you should have drawn on both sides of the piece of paper (check this). For this reason, we say the mobius loop 'only has one side'.

3) Cut down the scissor line

Carefully cut down the scissor line. How many loops do you end up with?



4) Is it a mobius loop?

Let's check if the one loop we end up with after step 3 is a mobius loop. We can test if something is a mobius loop by drawing a line down the middle of the loop, until you get back to where you started. If you have drawn on both sides of the piece of paper, then it's a mobius loop.

5) Make a new mobius loop.

6) Draw a new scissor line (one third of the way in)

This time draw a line that is one third of the way in from one edge of the mobius loop. Keep going until you get back to where you started.

Now look at your mobius loop. Can you find ‘the other edge’? Is there an edge without a line next to it?

You should find that ‘both edges’ have the line drawn close to it. For this reason, we say the mobius loop only has one edge.

7) **Predict!**

Predict what will happen if you cut along that scissor line.

8) **Cut down the scissor line**

Cut down the scissor line. Were you right with your prediction?

If you have created any loops, are they mobius loops? Check by drawing a line down the middle of them, until you get back to where you started. If you have drawn on both sides of the piece of paper, it is a mobius loop.

Can you explain this result?

9) **What’s similar?**

Have a look at the result after step 3, and the result after step 8. What is similar? What is different? Can you explain these results?

10) **Cut again?**

One of the two loops you ended up with after step 8 is a mobius loop.

Can you predict what would happen if you cut *this* new mobius loop along a line that is a third of the way in from its edge?

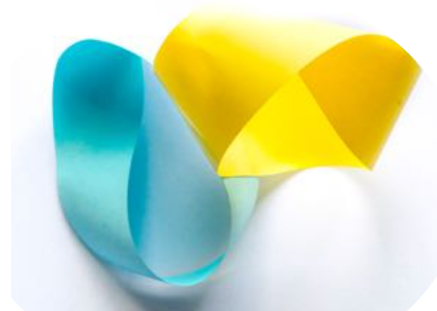
Try it! Were you right?

Finished? Try to make interlinking hearts:

Make two mobius loops, one twisted clockwise, the other twisted anti-clockwise.

Sellotape them to each other at right angles.

Cut both of them down the middle, all the way round. You should be able to arrange the result into two interlinking hearts!



Can you convince yourself why this has happened?