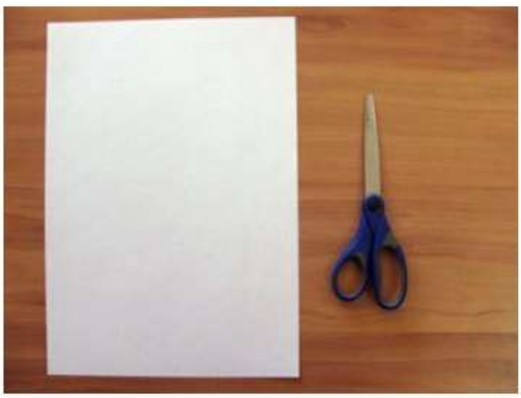
Most people are a lot larger than a piece of paper. But in this activity, you'll be able to squeeze through a hole in a sheet of paper. With practice, you might even be able to fit through a hole in a business card!

You will need

- Paper
- Scissors



You will need these items.

What to do

1. Fold a piece of paper in half like a book. Put the paper on the table with folded side closest to you.

2. Cut into the folded side, about 1 cm from the left hand edge, and start cutting straight towards the far side of the paper. Stop cutting about 1 cm before the opposite edge, so you don't cut all the way across the paper.

3. Turn the paper around so the fold is away from you. Cut in around 1 cm from the last cut, and stop about 1 cm before you get to the folded side.

Make the first cut about one centimetre from the edge.

4. Alternate between cutting from the folded side, and the side opposite. Keep your cuts 1 cm apart, and always stop cutting 1 cm before you get to the far side of the paper. When you have finished, you should have a zig-zag of paper.

5. Look along the folded side of the paper. You should have a series of loops of paper. Cut along the fold of each of the loops EXCEPT the first loop and the last loop. Leave these intact.

6. Carefully pull the paper apart, being careful not to tear it. You should have a large loop. Now try to fit yourself through the loop!

The next cut comes from the opposite side of the paper.

7. If you can't fit through the loop, try making another one with either:
   A larger piece of paper, or putting the cuts closer together (try 5 mm apart, and stopping 5 mm from the far side)

If you are still having trouble, **print out our template** (**available in pdf** or **Word document**) and simply cut along all the black lines.

Don't cut the first or last loops!

What's happening?

If you look at the cuts you've made in the paper, it looks like a maze. But you've actually turned the sheet of paper into a really long loop that should be long enough to go all the way around you.

The area of the sheet of paper remains the same throughout the activity – you haven't changed the size of the piece of paper because none of the cuts went all the way across the paper. But cutting the paper made the perimeter (edge) longer. If there are enough cuts, the perimeter is large enough to go all the way around you (in fact there are two edges on the strip of paper, so it goes around you twice).

Open up the loop, and you'll find it easy to fit through.

Real-life maths

For any given area, there is a minimum size for the perimeter (edge), but no maximum. The shape with the smallest perimeter is always a circle. Any other shape with the same area as a circle has a longer perimeter. But there's no shape with the longest perimeter. No matter what sized shape you choose, there's always a way to make another shape with the same area but a longer perimeter.

For example, a 10 x 10 cm square has a perimeter of 40 cm, and an area of 100 square centimetres. A rectangle that's 1 cm wide and 100 cm long has exactly the same area, but has a perimeter of over 2 metres! And it's also the same area as a 1 mm wide strip that's 10 metres long.