STEM club online-Magic paper loop challenge

Is it maths?
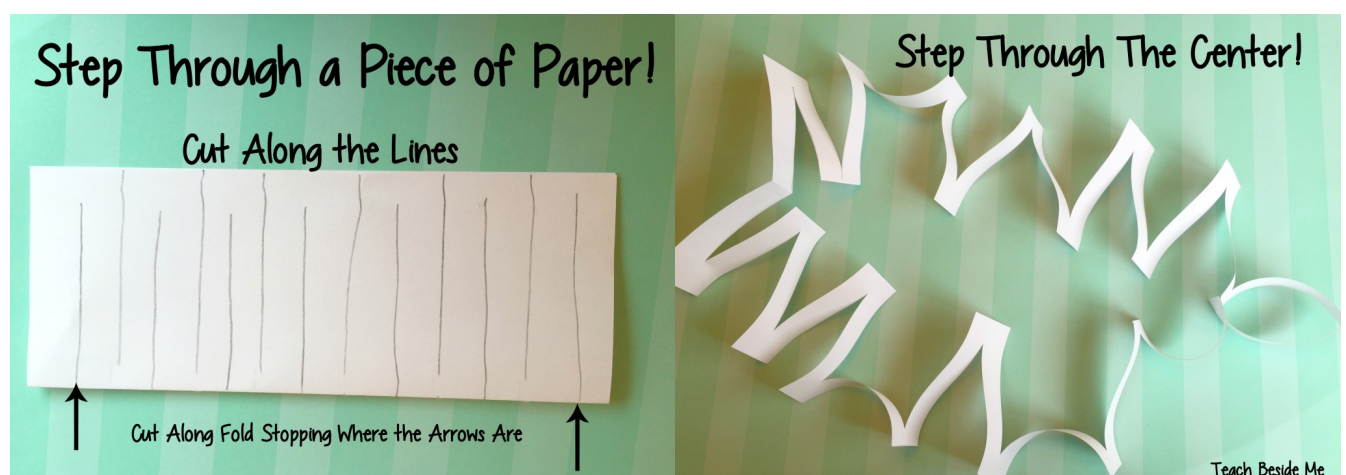*Is it MAGIC?*
Or is it both?

I have a variety of magical challenges involving paper and cellotape (if you don't have cellotape you can use glue). Have a go to see if you can recreate them! You could even perform these tricks to your family to amaze them!

Send a photograph or email informing us which maths magic trick you have done to Miss Ferguson or Miss Dawson.

1. Climb through one piece of paper

- Fold a piece of paper in half lengthwise.
- Then draw lines on the paper like the image below. Some lines starting from the top and reaching about ¾ of the page, others starting from the bottom and reaching ¾ of the page.
- Then cut down the pattern drawn by the pencil lines (not all the way to the other side). Make sure you are leaving a small bit uncut at the end of each line.

Step Through a Piece of Paper!

Cut Along the Lines

Cut Along Fold Stopping Where the Arrows Are

Step Through The Center!

Teach Beside Me

2. Turn two paper rings into a square

- Make two strips of paper.
- Tape them both into a loop, one inside of the other, without twisting them (like the image to the left below)
- Draw a line around the outside both of them as shown below.
- Cut around the lines you have just drawn.
- Open it up you will have a large square!

Turn 2 Rings Into a Square!

Paper Trick:
From 2 Rings into a Square!
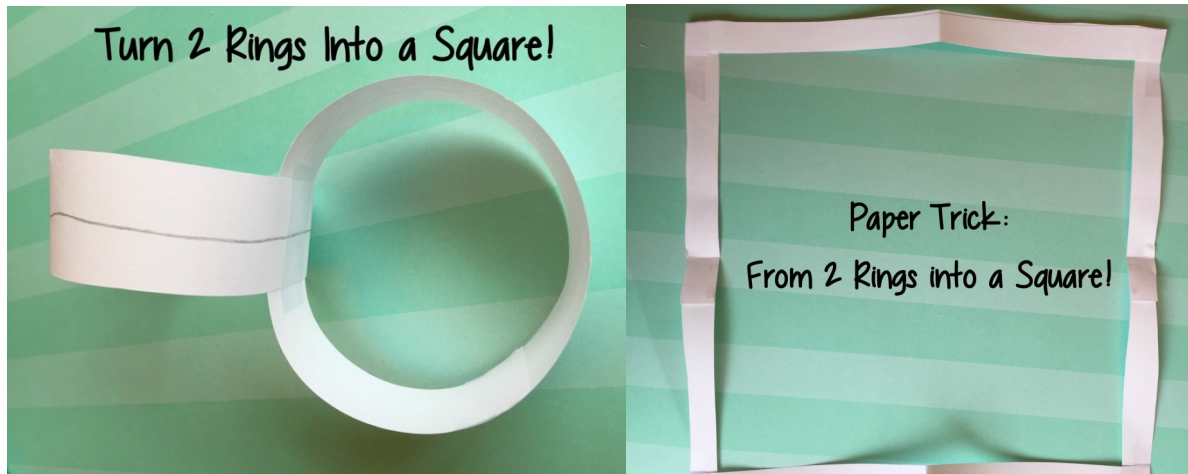
3. Make a mobius strip

A Mobius Strip is a band of paper that has only one side. It was created by a couple of German mathematicians in the 1800's. The Mobius strip has several curious properties, the geometry of the shape is hard to explain because it is unlike any other shape.

You can easily make one by cutting a strip of paper about 1 and a half inches wide. Then take one end of the paper and twist it once. Connect it to the other end and tape it.

Mobius strip

4. Turn a mobius strip into an infinity loop

- Form a mobius loop from trick 3.
- Draw a pencil line through the centre of the strip (you end up going all the way around and back up to the starting point).
- Cut through the centre line.
- You should form a larger loop than the one you started with.
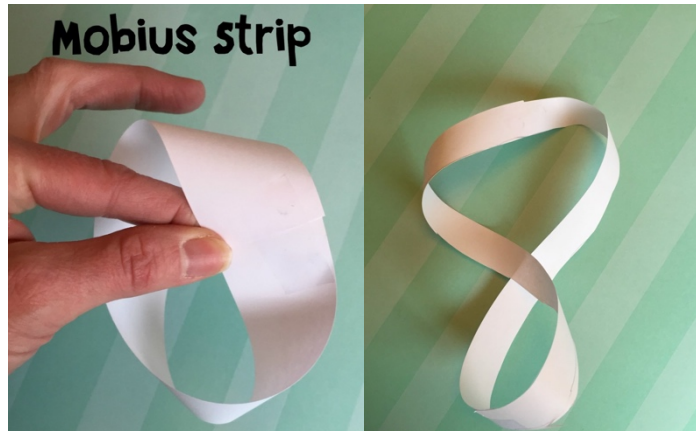
It is the second loop on this video: https://www.youtube.com/watch?v=KBFqA4bTmB0

5. Turn a double-twisted loop into an interlocked double ring

- Take a strip of paper, but this time twist it TWICE before you cellotape it.
- Cut through the centre.
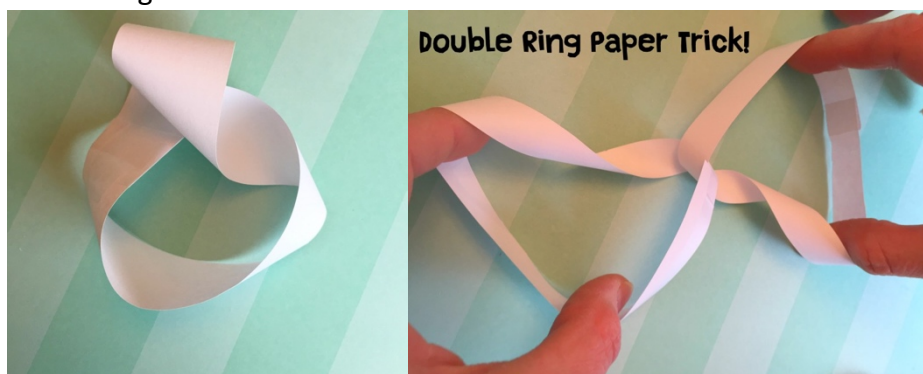
It is the third loop on this video:
https://www.youtube.com/watch?v=KBFqA4bTmB0

5. Loving these tricks?

You can carry out more investigations of your own.

- What happens if you twist the loop three times?
- What happens if you don't cut the loop in the centre?