How to make a homemade kaleidoscope

This is a STEAM (Science, Technology, Engineering, Arts and Maths) project to do at home.

You will need: long cardboard roll, felt tip pens, metallic pens (optional), paint/paintbrush or decorating materials such as stickers and colourful tape, pencil, sticky tape, old felt tip pen or half a bendy straw (bendy half only), thin white card, scissors, compass (optional), ruler, thin card (from a cereal box or similar), Blu Tac, aluminium foil, glue stick.

Instructions:

1. Paint or decorate the long cardboard roll. Leave to dry.
2. Draw and cut out three strips of thin card about 3.5cm to 3.8cm wide (each cardboard roll has slightly different internal dimensions), and make sure that each strip is the length of the cardboard roll. Cover each strip completely in aluminium foil and glue this into place – <u>the reflective side of the foil needs to be on the outside.</u>
3. With the sticky tape, first stick each strip together and then form a triangle and tape into place. The triangular prism should fit snugly into your cardboard roll.
4. With the thin white card, draw and cut out a circle about 9.5cm across (about the size of a large reel of sticky tape) – you can use a compass, if you wish. This will be the disc for the kaleidoscope.
5. Using the pencil and Blu Tac, make a hole the width of your old pen/straw in the centre of the white card disc. You need to put the Blu Tac on one side of the disc and gently push the pencil through from the other side to form the hole.
6. Now decorate one side of the disc with shapes and patterns using felt tip pens and metallic pens (optional). Use lots of bright colours.
7. Push the disc onto the old pen/straw and position so that the pen lid is behind the disc, or the disc is on the bendy section of the straw.
8. Use sticky tape to secure the pen/straw to the cardboard tube, as pictured below.
9. Your homemade kaleidoscope is complete! Hold the end (without the disc) to an eye and with one hand gently turn the disc. You should see lots of different shapes and patterns (reflections created by the designs on the disc) as you look into your kaleidoscope. Top tip: You can make other discs and swap them over to see different shapes and patterns (reflections).

Fun facts: The kaleidoscope is an optical device consisting of mirrors that usually reflect little bits of glass and other materials into a geometric design through the viewing end. The design is changed by rotating the other end of the device, so the design is continually changing and different with each turn. The kaleidoscope was invented by Sir David Brewster in 1816 and is usually sold as a toy, but it also has value for a pattern designer too.