

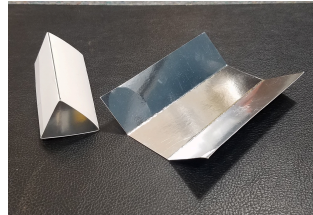
# 15-minute Family STEAM:

## Kaleidoscope



1. Using markers, stickers, decorative tape etc, decorate the kaleidoscopes first. You could decorate the tube, or you can decorate a piece of paper & tape one end to the tube to secure, and apply some glue to the underside as well, then roll up tightly, and secure the other end with tape.

2. Now, take the piece of mirror paper, and fold along the scored lines, MIRRORED SIDE IN, and tape together at the top. Carefully insert into cardboard tube; it should fit snugly.



3. Trim ends of straw so that there is about 1/2" past the flexible portion of the straw on one end, and 2-3 inches proceeding it on the other. Extend the flexible part, then tape the straw to the outside of the tube so that the flexible portion extends just past the end of the tube.

4. Using at least 2 colors (or more), make designs on the paper circles using markers. Experiment with different patterns, either dividing the circle into sections with different patterns, or doing the whole circle in the same pattern.

5. Poke a hole in the center of the circle with a pencil, and carefully thread it onto the flexible portion of the straw (The accordion folds help keep it in place)

6. Stand in well-lit area, and hold kaleidoscope up to your eye with one hand, look through while turning the circle with the other.

### The Science

Kaleidoscopes work on the principle of multiple reflections. The mirrors reflect the images of objects inside, creating a symmetrical pattern.

When you look at your reflection in one mirror, you see light that has come from your face and bounced off the mirror. When there are two mirrors, you see the light that bounces off one mirror, and also the light that bounces from mirror to mirror before coming back to your eyes.

A kaleidoscope works by reflecting light. As you turn the circle on the end of the kaleidoscope the little decoration reflections move which makes the patterns of color move.

Taken in part from [science.howstuffworks.com/kaleidoscope.htm](http://science.howstuffworks.com/kaleidoscope.htm) & [adventuresinstorytime.com](http://adventuresinstorytime.com)