



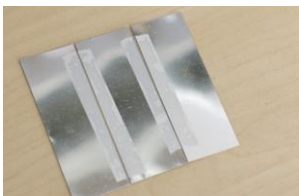
Kaleidoscopes

Supplies:

1. Empty Toilet Paper Tube
2. Mylar Sheets, you want a sheet that is a little thick
3. Scissors
4. Markers
5. Tape
6. [Circle Template](#) – Cardstock works best
7. Bendy Straw
8. Stickers and Paint for decorations

Directions:

1. If you will be decorating your cardboard tube, that must be done first. Make sure your tube is all dry if you painted it before you begin to build your kaleidoscope.
2. Next, you'll need to cut your Mylar sheets into three equal strips. You'll want the size to be just right so the finished kaleidoscope insert fits snugly in your cardboard tube and won't fall out.
3. Line up your Mylar strips, leave a tiny space between each one. (Place the shiniest/least scratched sides face down.) Tape them together over the spaces
4. Fold the taped Mylar into a triangular prism and tape along the top to hold in place.
5. This should fit snugly inside your cardboard tube.
6. Cut off the bendy end of a flexible straw.
7. Tape it along the top of your tube with the flexible part of the straw hanging over the edge.
8. Cut out a circle from cardstock.
9. Poke a hole in the center of your circle.
10. Decorate the circle using markers, stickers, crayons etc. Try out different designs, shapes, and letters!
11. Place the circle onto your straw with the design facing the kaleidoscope. You want the hole to fit over the flexible portion of the straw so it will turn easily.
12. Look into your kaleidoscope and explore all the reflections created by your design!



Why does it work?

At the most basic level, a kaleidoscope is made of two or more mirrors or reflective surfaces positioned at an angle to each other, usually forming a V-shape or a triangle. A tube or case -- often looking like a spyglass -- is the body surrounding the mirror assembly. A collection of objects is positioned at one end of the mirrors, and there's an eyehole at the other end.

What you see when you look through that eyehole will never be exactly the same twice! While the container holding the objects is usually as large as -- or larger than -- the kaleidoscope tube, only the portion of the objects that fall within the space of the triangle within the object holder is reflected.

Even the simplest collection of ordinary buttons, beads or glass pieces is transformed into an intricate and beautiful design when a kaleidoscope does its work. This is due in part to the principle of symmetry. If you draw a line down the center of a symmetrical object, the halves on either side of the line are the same. Commonly, you'd say that they're mirror images of each other. In a kaleidoscope, each repeated image is symmetrical in relation to the image beside it.