

Kaleid-o-mania

Reflections, light, and your artistic talents create a dazzling kaleidoscope!



1 Get what You need.

- paper towel tubes, 1 per kaleidoscope
- 8" x 11" transparency film (for overhead projectors), cut into strips 1 1/4" wide and 11" long
- ruler
- clear tape
- scissors
- sharpened pencil
- small 3 oz. paper cups (unwaxed)
- colored markers
- small mirrors, large mirror, paper, pencil (optional—for Dig Deeper activities on back of sheet)

2 Make a kaleidoscope.

- Cut the transparency film into strips 1 1/4 inches wide and 11 inches long.
- Tape the long edges of the three strips of the transparency film together, forming a triangle. Line up the edges of the strips carefully, and use as little tape as possible.
- Slide the triangle into the paper towel tube. Look through it—what do you see?
- Using markers, draw a colorful design on the inside bottom of the cup.
- Place the cup over one end of the tube and look through the other side. Turn the cup. What do you see—and where do you see it? At the front of the tube? On the sides?

3 Predict, experiment, and observe.

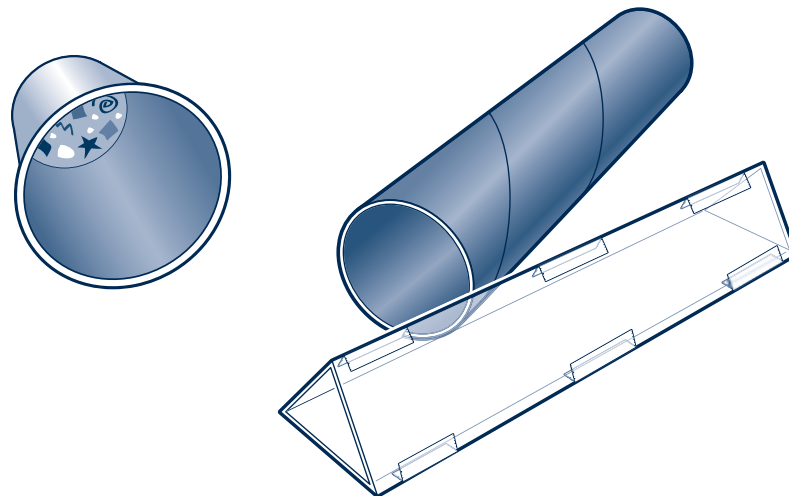
Predict what will happen if you change one thing (called a *variable*) on your kaleidoscope. What would happen if you change:

- the design on the cup?
- the reflecting surfaces inside?
(What if you use a rolled-up piece of transparency film instead of a triangle?)
- how light enters the tube?
(What if you cover the cup with your hand or poke a few small holes into the bottom of the cup?)

Try it and see if your prediction was right!

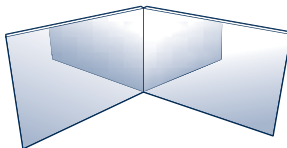
Chew on This!

Kaleidoscopes use reflecting surfaces (like mirrors or shiny smooth plastic) to produce beautiful patterns. Reflections of your design are mirrored in the shiny surfaces of the triangle. Those reflections bounce back and forth off the three sides, creating even more reflections. When you rotate the cup, the reflected designs shift and change. All this depends on light—put your hand over the cup and block all the light, and you'll see nothing!



Dig Deeper

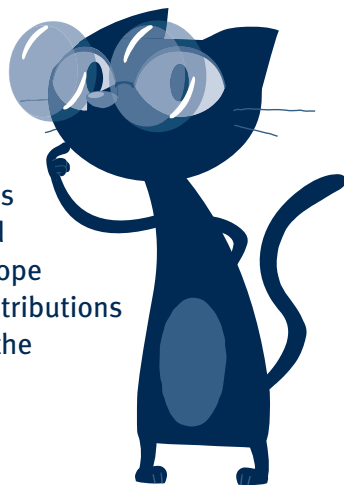
Hall of mirrors. Place two small mirrors in a “V” shape on top of a magazine or picture. Change the angle of the mirrors by moving them closer together or farther apart. What happens?



Mirror writing. Write your name on a piece of paper and hold it up to a mirror. What do you notice? Keep holding the paper up to the mirror, and on a different sheet, copy the letters exactly as you see them. Then hold that paper up to the mirror—what do you see now?

Did You Know?

A 19th century Scottish scientist, David Brewster, invented the kaleidoscope. Even as a child, Brewster was fascinated by light and optical instruments—he built his own telescope at the tender age of ten. He made lots of contributions to science, but what made him famous was the kaleidoscope—a toy!



Watch **FETCH!** on PBS KIDS GO! (check local listings) and visit the **FETCH!** Web site at pbskidsgo.org/fetch.



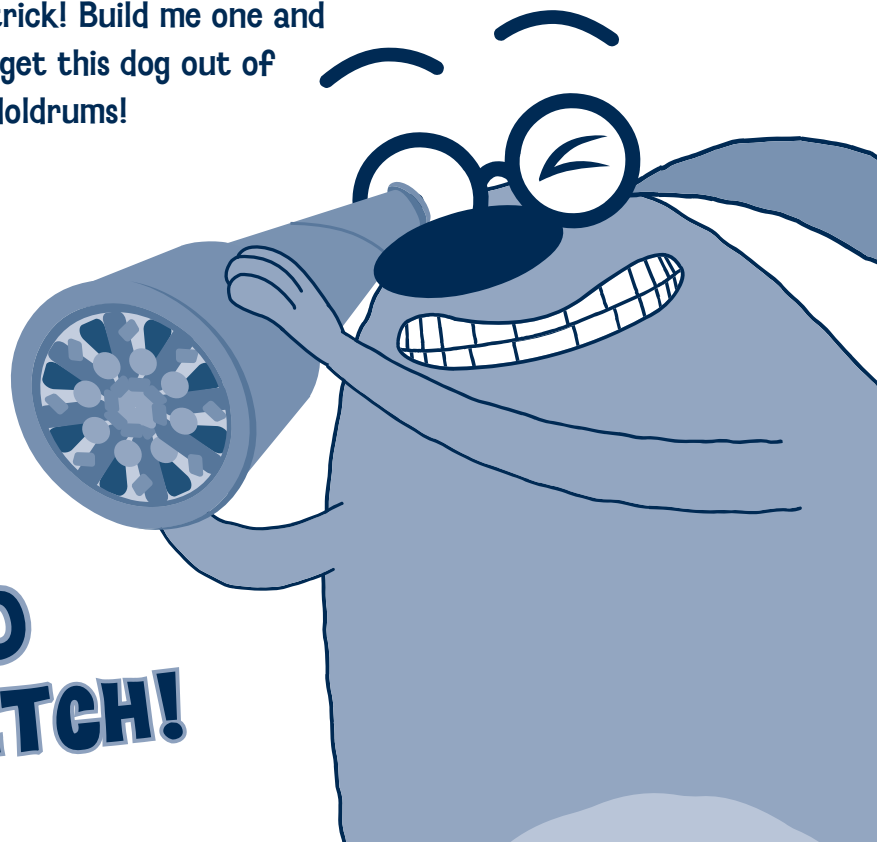
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Fold

Fetch!

Kaleid-o-mahia

It's a gloomy, gray day, and I'm feeling droopy as a hound dog. I need something to get my tail wagging again—a splash of color, a bit of excitement, a little razzle-dazzle . . . hey, a fabulous kaleidoscope might do the trick! Build me one and help get this dog out of the doldrums!



GOOO FETCH!