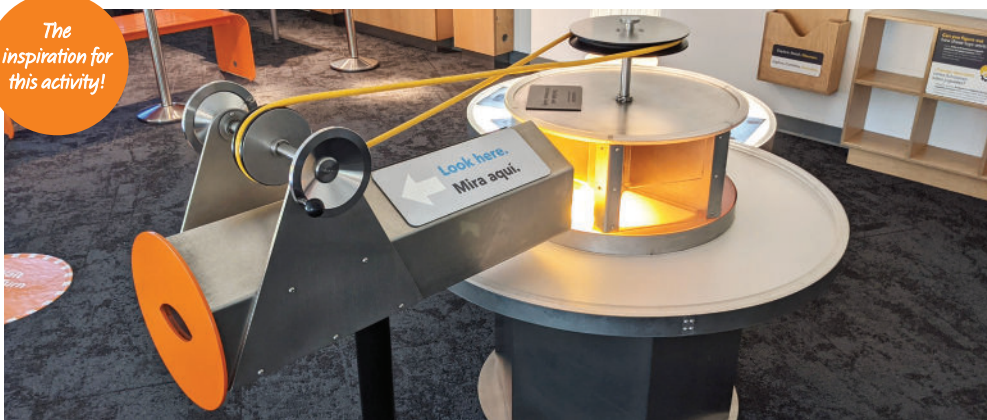# moxi at home

KaleiDIYscope.

Make your own kaleidoscope! Using a paper towel roll, cardboard, and tin foil, you can recreate one of MOXI's exhibits.

The inspiration for this activity!

MOXI Exhibit Connection	Kaleidoscope
Age	6+
Time	20+ min
Category	Light, Exploration, Observation

Educational Value	
Based on Next Generation Science Standards (NGSS)	
Grade	**Standard**
K-2	K-2-ETS1-3 1-PS4-3
3-5	3-5-ETS1-2
6+	MS-ETS1-3

*May include opportunities to employ the following Science and Engineering Practices:

• Asking questions
• Defining problems
• Designing solutions
• Obtaining, evaluating, and communicating information

For Educators

Design Challenge

Build a kaleidoscope to explore light and patterns while conducting tests on materials with reflecting, transparent (see-through), and opaque (not see-through) properties.

Materials

Below are some ideas for supplies, but be creative! What else could you use for each of the categories below? Your home is a creative tool chest waiting to be discovered!
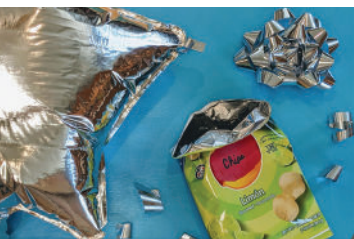
Tube	Reflectors	Transparent Filters	Tools
• Paper towel roll	• Mylar balloon	• Recycled plastic	• Tape
• Toilet paper roll	• Inside of a chip bag	• Water bottles	• Scissors
• Thin cardboard	• Shiny plastic	• Container lids	• Ruler
	• Mirrors	• Sandwich bags	• Pencils
		• Tissue paper	• Paints
		• Colorful plastic	• Markers
		• Beads	
		• Toys	

Instructions

Try reusing plastic material with shiny, reflective properties like chip bags or balloons.
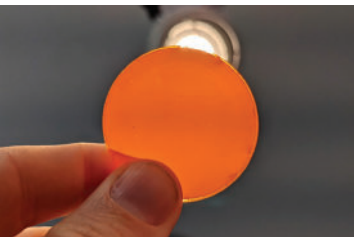
When testing, hold a material you think might be transparent up to a light source. If you can see light through the material (even just a little bit) it's transparent. Try using materials with different levels of transparency as kaleidoscope filters!
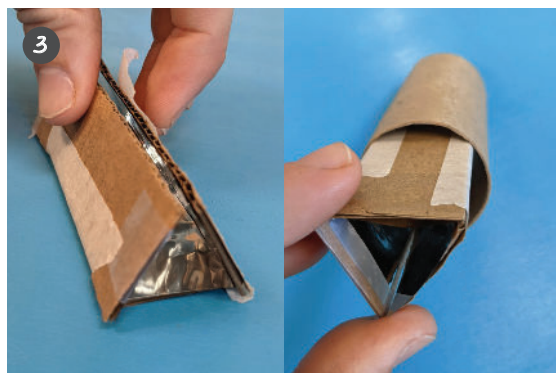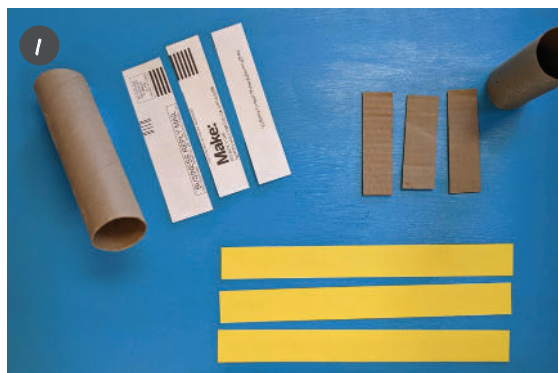
1. Find a cardboard tube to be the body of your kaleidoscope. Using the tube as a guide, cut three flat strips of cardboard or sturdy paper. Each strip should be about one inch wide and one inch shorter than the tube.

2. Attach strips of reflective material to each cardboard strip. Try to cut the reflective material the same size cardboard strips so that it doesn't hang over the edges.

3. Once all three strips are reflective, tape them together into a long triangular prism. The smooth reflective material should be on the inside of the triangle. Now, slide your triangle inside your tube.

4. Finally, create colorful filters to cover one end the end of the tube. Try using markers to color pieces of clear plastic or thin paper. Or use tape to attach transparent, colored plastics like beads.

5. Now test your design by looking through the open end. Twist and spin the tube and try pointing it at different light sources.
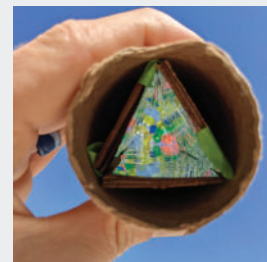
Activity Extensions

invent Try changing the shape, size, and position of your reflectors. If one side of the triangle is bigger than the other two, how does it change the image?

investigate Point a camera into your kaleidoscope to capture your unique designs. Share them with friends and have them guess what your filter is made from.

Curiosity Corner

What does "kaleidoscope" mean?

The word kaleidoscope is actually three different words from Ancient Greek put together into one. The individual words mean "beauty," "shape," and "to look or examine." When you put them all together the word "kaleidoscope" means, "to look at beautiful shapes." Even though it's Ancient Greek, the word was made up by an inventor in the 1800s. Can you think of other words with "scope" in them?

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