

**Topics**

Light, Reflections,  
Angles

**Materials**

- ✓ Two rectangular pieces of cardboard, cut to same size
- ✓ Two pieces of Mylar, cut the same size as cardboard
- ✓ Double-stick or clear tape
- ✓ Optional: Simple and complex shapes/images to explore, protractor

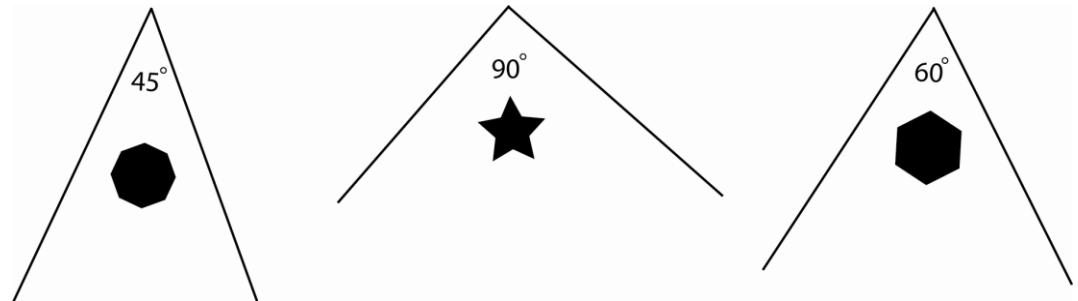
**Learning Standards**

CCSS Math:  
Measurement and  
Data, Angles;  
Geometry, Symmetry

NGSS: Physical Science,  
Wave Properties;  
Engineering

# Hinged-Mirror Kaleidoscope

A different angle on the geometry of reflections



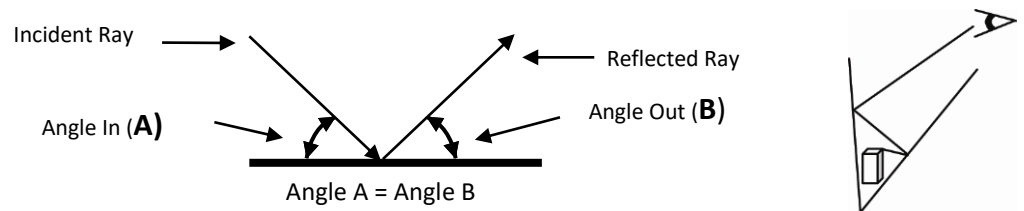
This easy-to-create hinged mirror allows you to explore simple geometry and the science of light and reflections.

**To Do and Notice**

1. Create two mirrors by taping the mylar pieces to the cardboard pieces. Keep the mylar as flat as possible and avoid touching the mirror surface.
2. Hinge the two mirrors together with a piece of tape so that when the two mirrors are folded closed the mylar is on the inside.
3. Put different shapes, objects and/or images in front of the mirrors. Vary the angle of the mirrors. See illustrations above for examples.
4. Count the number of virtual images in the mirrors of an object/image that appear, depending on the angle between the two mirrors.
5. Optional: Measure the angle between the mirrors. Establish a relationship between the angle and the number of virtual images observed.

**The Science Behind the Activity**

We see an object when light reflected or emitted from the object travels to our eye. When an object is between the two hinged mirrors, light from the object bounces back and forth between the mirrors before it reaches the eye. The general rule for a reflected light ray is “angle in = angle out” (see below).



An image is formed each time the light bounces off a mirror. The number of images that you see in the mirrors depends on the angle that the mirrors form. As you make the angle between the mirrors smaller, the light reflects and forth more times, and you see more images.

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