ACTIVITY AT HOME

PINK PALACE MUSEUM

Physics

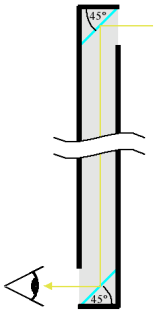
Engineering

PERISCOPE

Build a mirrored tube that lets you see around corners and walls!

Materials

2 Quart-sized milk cartons
2 Small pocket mirrors
Craft knife
Ruler
Pen or pencil
Masking tape



Note: Do not use periscope to look at the sun or bright lights.

Results

You created a periscope!

Procedure

- Ask an adult to cut around the top of one carton to remove the "roof."
- Ask them to cut a small, square hole in the bottom front of the same carton. Be sure to leave about 1/4" of carton on each side of the hole.
- Lay the carton you just cut on its side so that the hole is laying to your right. On the side that is facing up, measure 2 3/4" inches from the bottom on the left side. Use the pencil and ruler to create a diagonal line from the bottom right corner to the mark you just made.
- Ask an adult to cut across that line, starting at the bottom right corner. Do not cut all the way to the left edge.
- Slide your mirror through the slot you just created so that the reflecting side faces the hole in the front of the carton. Widen the hole if necessary to get it to fit. Tape the mirror loosely in place.
- Hold the carton up to your eye and look through the hole you just cut. You should be able to see the ceiling. If not, adjust the mirror.
- Repeat all steps on the second carton, excluding the step where you remove the "roof."
- Stand up one carton on the table, with the hole facing you. Place the other carton upside-down, with the mirror facing away from you.
- Use your hand to pinch the open end of the upside-down carton just enough for it to slide into the top of the other carton. Tape the two cartons together.
- Use your periscope to look over a fence or around a corner!

Why?

Light reflects away from the mirrors at the same angle that it hits them. The mirrors in your periscope should be positioned at 45 degree angles. When light hits the mirror at the top, it is reflected down the tube at a 45 degree angle and hits the mirror in the bottom by your eye. That light is them reflected off the bottom mirror at a 45 degree angle and into your eye.

To learn more about light, check out the Pink Palace Museum's *Light and Color Program.*

This activity was adapted from The Exploratorium's "Up Periscope" activity. You can find more activities on their website, exploratorium.edu