OH WOW! Moment
Activity By Colleen Ruby, Education Coordinator
Grades 1-4

Up Periscope

STUDENTS WILL BE ABLE TO:

Build a mirrored tube they can use to see around walls.

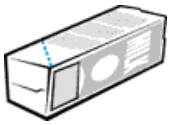
BACKGROUND INFORMATION:

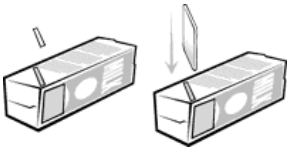
Periscope comes from two Greek words, peri, meaning "around," and scopus, "to look." A periscope lets you look around walls, corners, or other obstacles. Sub-marines have periscopes so the sailors inside can see what's on the surface of the water, even if the ship itself is below the waves.

MATERIALS:

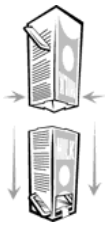
- Two 1-quart milk cartons
- Two small pocket mirrors (flat, square ones work best)
- Utility knife or X-Acto knife/scissors
- Ruler
- Pencil or pen
- Masking tape

PROCEDURE:





1. Use the knife/scissors to cut around the top of each milk carton, removing the peaked "roof."
2. Cut a hole at the bottom of the front of one milk carton. Leave about 1/4 inch of carton on each side of the hole.
3. Put the carton on its side and turn it so the hole you just cut is facing to your right. On the side that's facing up, measure 2 3/4 inches up the left edge of the carton, and use the pencil to make a mark there. Now, use your ruler to draw a diagonal line from the bottom right corner to the mark you made.
4. Starting at the bottom right corner, cut on that line. Don't cut all the way to the left edge of the carton-just make the cut as long as one side of your mirror. If your mirror is thick, widen the cut to fit.
5. Slide the mirror through the slot so the reflecting side faces the hole in the front of the carton. Tape the mirror loosely in place.
6. Hold the carton up to your eye and look through the hole that you cut. You should see your ceiling through the top of the carton. If what you see looks tilted, adjust the mirror and tape it again.
7. Repeat steps 2 through 6 with the second milk carton.
8. Stand one carton up on a table, with the hole facing you. Place the other carton upside-down, with the mirror on the top and the hole facing away from you.



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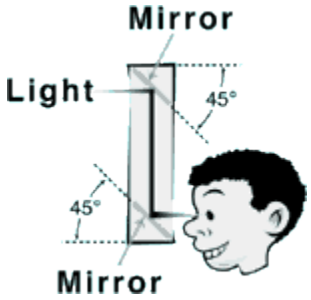
9. Use your hand to pinch the open end of the upside-down carton just enough for it to slide into the other carton. Tape the two cartons together
10. Now you have a periscope! If you look through the bottom hole, you can see over fences that are taller than you. If you look through the top hole, you can see under tables. If you hold it sideways, you can see around corners.

EXPLANATION

Light always reflects away from a mirror at the same angle that it hits the mirror. In your periscope, light hits the top mirror at a 45-degree angle and reflects away at the same angle, which bounces it down to the bottom mirror. That reflected light hits the second mirror at a 45-degree angle and reflects away at the same angle, right into your eye.



Try This:

Can you build a periscope that uses more than 2 mirrors?

Try drawing a mustache or funny hat on your mirror, then place it on your friends when spying them through your periscope!