

BUILD YOUR OWN PERISCOPE

Build this simple tube out of materials that you can find at home. It will let you see around corners and over walls!

What you need:

- * Two small, flat mirrors
- * Two one-quart milk cartons
- X-acto knife
- Ruler
- Pencil
- Masking Tape
- Double sided tape

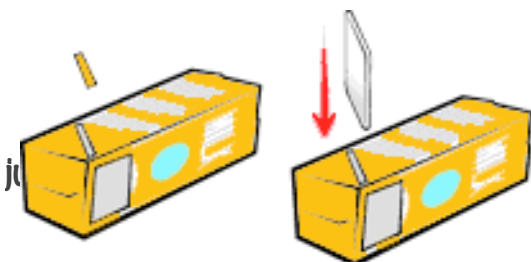
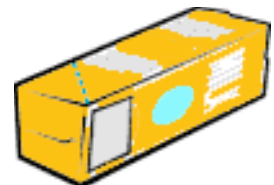
What to do:

Cut off the triangular shaped top of each milk carton so you just have the rectangular container. Have an adult help you make the cuts in this project with scissors or an X-acto knife.



Cut out a square opening on one side at the bottom of one of the containers. Leave about 1/4 inch from each edge of the cut-out.

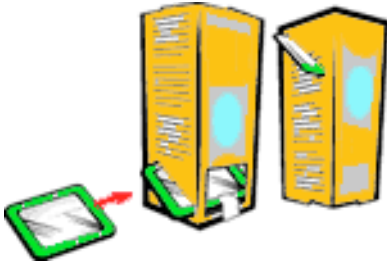
Lay the milk carton on its side so that the hole you just cut out is on the right side. Measure up 2-3/4 inches from the left edge and make a mark. Use a ruler to draw a diagonal line from the bottom right corner to the pencil mark.



Cut along this line a distance that is as long as one side of your flat mirrors. Make the cut as wide as your mirror is thick. Slide the mirror through the slit you cut so the reflecting side of the mirror faces up towards the hole you cut in the carton. Using masking tape or double-sided tape attach the mirror to the carton.

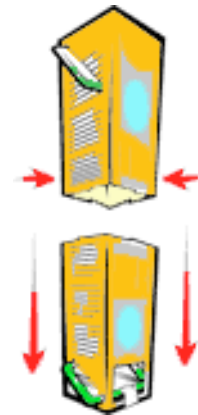
Hold the milk carton up to your eye and look through the hole you cut out. You should see whatever is above you in the reflected image on the mirror. If the image looks tilted adjust the mirror accordingly.

Do this process a second time on the other milk carton.



Stand one of the milk cartons on a table so that the hole you cut out at the bottom is facing towards you. Turn the other carton upside down and turn it so the hole you cut out in that one faces away from you.

Use your hand to pinch the open end of the milk carton that is upside down so that you can insert it and slide it into the other carton. Slide the top carton into the bottom one about 1 inch and then tape the two cartons together with masking tape.



You have now completed your telescope. Look through the bottom hole. What do you see? Depending on how you hold it, you can see around corners, over people's heads, or even under the table!

So how does a periscope work?

Light reflects away from a mirror at the same angle that it hits the mirror. In a periscope, the light hits the top mirror at a 45-degree angle and reflects it at the same angle to the bottom mirror that is also at a 45-degree angle. The light is then reflected off the second mirror and into your eye.

