



Periscope

Understanding optics begins with exploring and enjoying the fun and tricks of light. Make a simple periscope and the reflected light will let you see around corners or over walls. And as with all models, actually making it is the best way to understand how it works.

Simple Periscope



★ GOAL: To create a simple instrument for observation. Have fun with optics. Build model making skills

★ MATERIALS: 2 empty milk cartons, cardboard cutter, gaffa tape, pencil, 2 rectangular hand mirrors, a ruler, scissors.

★ AGE GROUP: Paired activity for 6 years and up.

CAUTION Sharp tools! Ask an adult to do all the cutting.



WHAT TO DO:

- Make sure that your two empty milk cartons are clean and dry, then cut off their tops.



- Using a cardboard cutter, ask a grown-up to make a window at the base of one carton.



- This is your viewing window.



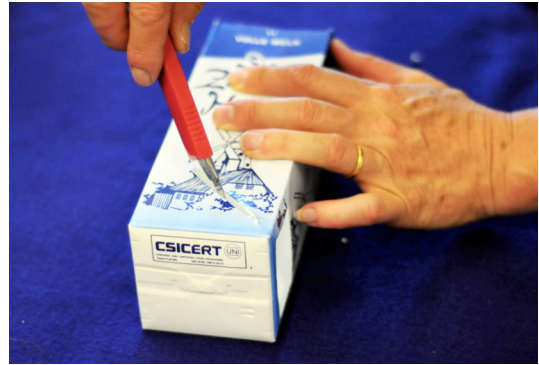
- Lay the carton on its side so that the window is facing to the right. Draw a line 45° from the bottom right hand corner to where it meets the left hand edge.



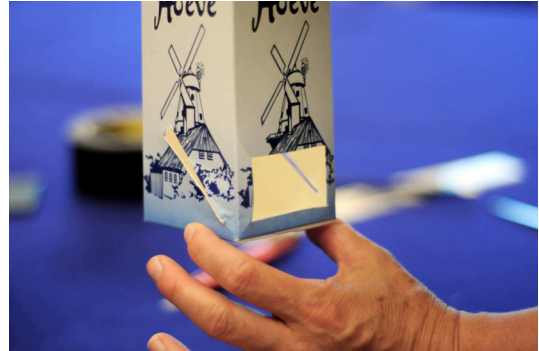
- Flip the carton over so that the window is now facing the left and draw a line 45° from the bottom left hand corner to where it meets the right hand edge.



- Make a cut on that line ONLY as long as the shorter side of the hand-mirror.



- Flip the box over and do the same on the other diagonal line.



- Insert the mirror into the slot (if the cut is too narrow, widen the cut to fit the mirror). The reflecting side must face the window.



- Hold the carton up and look through the window. Ask your partner to wiggle his/her fingers over the top. If what you see is tilted or distorted, adjust your mirror until it straightens out. If the mirror is loose, tape it in place.



- When you are satisfied with one carton follow exactly the same steps with the second one. You will finish with 2 identical cartons, each with a mirror set in the base at 45°.



- Place one carton on the table with the window facing you. Place the other carton on top with the window facing away from you. Pinch the top carton a little so that it slips just inside the bottom carton. Tape them securely.



- Ready for watching from a concealed spot.



- You can hold it sideways, and see around corners.



- You can also look through the bottom window and see over fences. Look through the top window and see under tables. Experiment with a longer tube and notice that the image gets smaller.

Playing with mirrors, reflections, and light is great fun!

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