

Materials

- › Cardboard box (An old cereal box would work well)
- › Old mirrors or bought online/shop
- › Cling film/tinfoil
- › Sticky tape and glue

Activity Overview

- › This is a fun activity that focuses on using reflection of light to view images
- › Do the activity below to help better understand how submarine periscopes operate



Activity Plan

- › Using an old cardboard box follow the instructions below to create your periscope
 1. Make sure box is empty before using it
 2. Print out or copy the template on the last page
 3. Glue the template to the cardboard box and leave to dry
 4. Cut around the template along the solid lines
 5. Using a ruler to help, fold inwards along the dotted lines, using a ruler will allow the lines to stay straight
 6. Glue or tape the flaps to create the shape of the periscope
 7. Glue the mirrors into place on the sloped faces ensuring the mirrored face is visible!
 8. Wrap the box in paper or colour/paint the box to a design of your choice.
- › Take a picture of you using your periscope and share it with us using [#BabcockSTEM](#)



Good luck on your mission!



Learning Objective

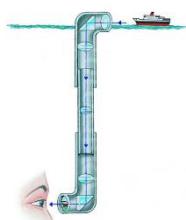
- › Understand how light reflects on a mirror and how this transfers to your eye
- › Understand why it is important to be precise when manufacturing a product



Reflective Questions

- › What happens if the mirrors aren't positioned correctly? Can you see?
- › What happens if the shape of your periscope isn't perfectly straight?
- › What do Babcock engineers need to think about when fixing periscopes?

Periscopes Old and New



The first naval periscope was invented in 1845 and consisted of a vertical tube containing two mirrors set at 45 degrees. These were used within submarines to see above the waterline when the submarine was fully submerged.

Older style submarines use a traditional periscope similar to the one we have built using mirrors and pipes. Newer ones are a lot more advanced.

But how does the periscope work?

Light 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. The reflected light hits the second mirror at a 45 degree angle and reflects away at the same angle, into your eye.

