

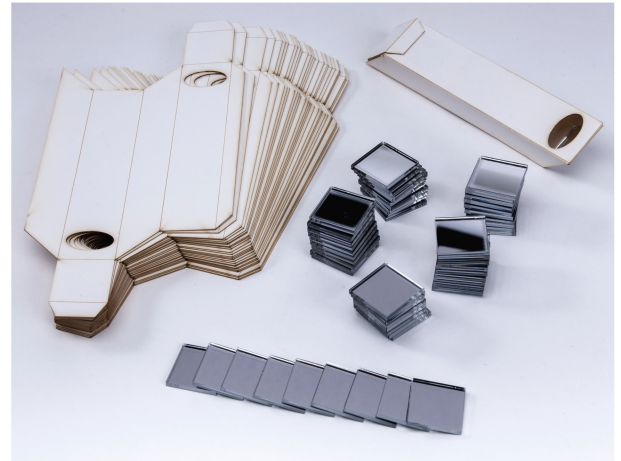
Contents

Contents:

- 30 Periscope "blanks"
- 60 mirrors

Needed but not included:

- Tape (double-sided makes for neater construction)



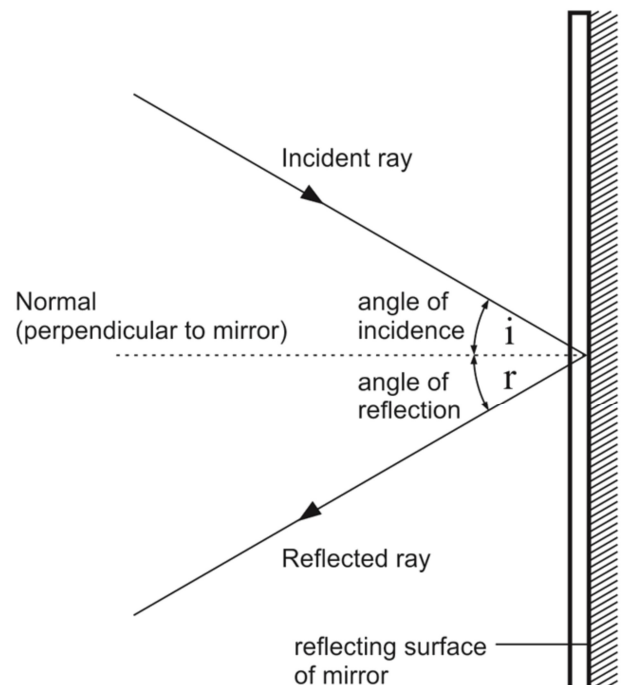
Background

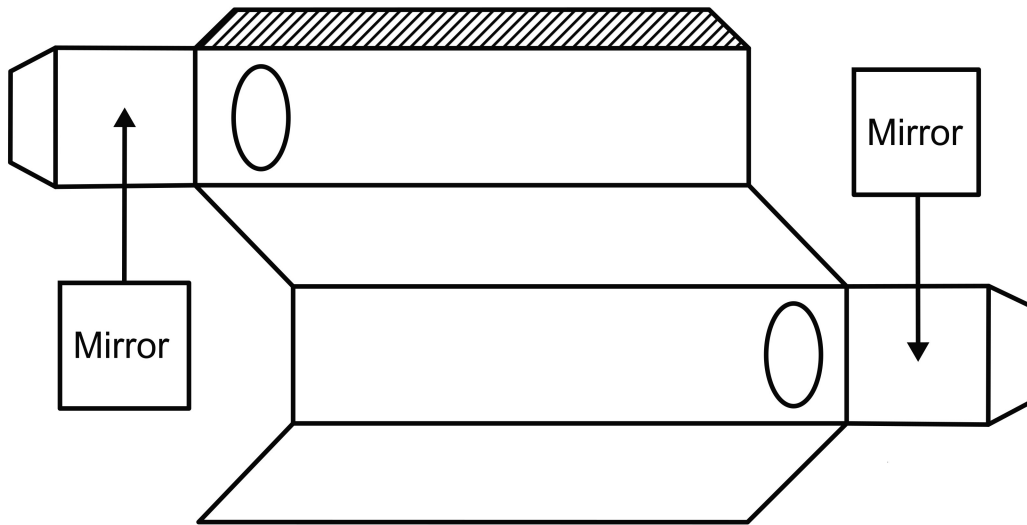
Periscopes' most well-known use is probably on a submarine. The first naval periscope was invented by Hippolyte Marié-Davy in 1854. A little investigation into the word "periscope" tells us what it does. "Peri-" is an English prefix derived from Greek which means "around." A scope is a commonly used instrument for viewing--these have many different uses in our every-day world. A periscope allows a viewer to look around a physical barrier like a wall. Words ending in "scope" tell us about what they do. Microscopes allow us to see things on a microscopic scale, telescopes let us see things very far away, stethoscopes allow us to hear inside a patient which might give us a clue to what we would see inside if we had x-ray vision.

Periscopes utilize the laws of reflection. These laws state that:

1. The incident ray (i), reflected ray (r), and normal all lie in same plane
2. Angle of reflected ray and incident ray are equal when measured from the normal

It is important to note that the "normal" is an imaginary line that is perpendicular to the reflective surface. This is a standard convention for many physics concepts. The normal, incident, and reflective rays are labeled in the diagram to the right. Follow the steps on the next page to construct your own periscope.





1. Place the periscope blank with the scored side DOWN
2. Using the diagram below as a guide, place mirrors on each of the flaps labeled "mirror." The side of the mirror that does not reflect should be attached to the periscope.
3. Fold the periscope into a rectangular tube so the mirrors will be on the inside. Attach the shaded tab to the opposite side of the body.
4. With tape, attach the tabs on the mirror flaps to the body of the periscope.

Now you're ready to use your periscope!

Look through one of the holes to see through the periscope. How do the laws of reflection allow you to see around obstacles? Look at the cross section to the right and in terms of the laws of reflection, explain what's happening to the light when you look through the periscope.

