

Mirror Obstacle Course

Introduction

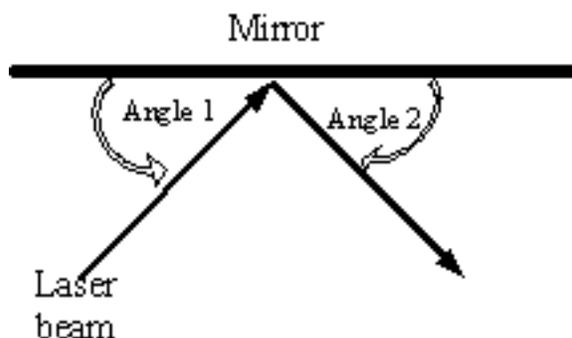
Mirrors are everywhere in our daily lives – in bathrooms, cars, dentists' offices and disco balls! A lot of devices have mirrors inside them, like microscopes, telescopes, and some kinds of cameras. You don't see the mirrors, but they're used to direct an image of whatever you're looking at right to the eyepiece. Sometimes the mirrors inside a device can be very complicated. In this experiment, you will arrange five mirrors to direct a beam of light to a target zone.

Materials

A table, covered with a big piece of blank paper
5 mirrors (4 flat, 1 curved) mounted on stands
A laser
Pencils
Protractors
A target
Obstacle block
Rulers for drawing straight lines

Methods

Use the mirrors to direct the laser beam around the obstacle blocks until it reaches the center of the target. Be very careful not to shine the laser in your eyes! You don't have to use all the mirrors if you don't need them all. Once you hit the target, use a ruler to help you trace the path the laser takes, and draw where the mirrors are. Draw a straight line along each mirror's surface to show its angle. When you've drawn all the lines, use the protractors to measure the angles as shown in the picture, and write the measurement next to the mirror.



Discussion Questions

1. What pattern do you see in the angle measurements?

2. Is there one mirror that behaves differently? What do you notice about the surface of that mirror? What does your face look like in that mirror?

Assessment questions

1. When would you need to set up a series of mirrors like this, to change the path of a beam of light?
2. Can you think of any other ways that mirrors are used to change the path of light (or an image)?
3. Think about how your face looks when you look into a curved mirror. When might you want to use a mirror with a curved surface?