

GEOMETRICAL OPTICS

Light rays

In geometrical optics we think of light rays as perfectly thin and perfectly straight lines pointing radially outward from a light source. Unless blocked by an object they will continue infinitely.

How we see things

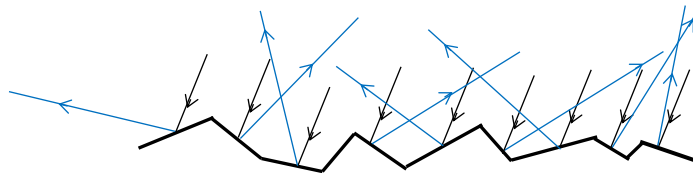
We can only see an object if light travels from that object into our eyes. Our eyes are detectors for light; they send messages to our brain, and the information is processed in the brain.

An object that we see can either generate its own light (a **luminous object**, such as the sun) or it can reflect light into our eyes (an **illuminated object**, such as the moon).

We can only see an object if a light ray travels along a straight line from that object to the eye. Only light that reaches our eyes directly can be detected; it is impossible to see a light ray from the side.

How most objects reflect light

Illuminated objects reflect light and can thus be seen. Most surfaces are not perfectly smooth (like a mirror for example) and reflect light in many directions. This is called **diffuse reflection**. Diffuse reflection allows us to see objects, because incident light rays are reflected off every portion of the object's surface – in many directions. From each point of the object, one of the many reflected light rays will travel in the direction of the eye and reach it.



Shadows

A shadow is a region where light rays do not reach because they are blocked by an object. The outline of the shadow can be easily sketched using the model of light rays as straight lines.