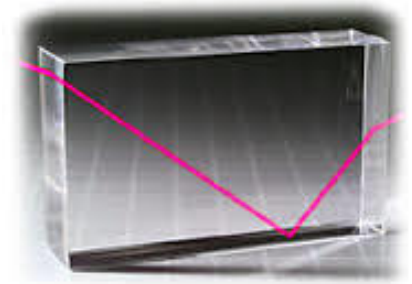


# Introducing Fiber Optics

Fiber optic cables carry the signals that make up our emails, texts and voice calls across the globe at an astounding speed by taking advantage of the properties of light. The specific property of light / matter interaction that fiber optic cables rely on is called Total Internal Reflection.

## Materials

- Red or Green Laser or Laser Blox
- Lumi Rod Fiber Optic Demonstrator
- Acrylic Refraction Block
- Protractor



## Hands On

1. **Explore Total Internal Reflection** - If you look at the right angle, a transparent angle can reflect light better than any mirror. To observe the phenomenon, point the laser into the acrylic block so that it enters at an angle. Adjust the angle until you notice that the beam no longer passes through the block, but reflects off the inner edge just like in the image.
2. **Find the critical angle** -Using a protractor to measure the incident and reflected angles, find the angle at which no beam is transmitted and nearly 100% of the beam is reflected,. This is the Critical Angle.
3. **Observe Light Transmission** - Total internal reflection helps transmit telecommunications data along optical fibers. Any light that is not aligned parallel to the axis of the fiber hits the wall of the fiber and is reflected (totally!) back inward, since the angle of incidence with which the light hits the wall is much larger than the critical angle . This prevents the signal from weakening as it travels a long distance.