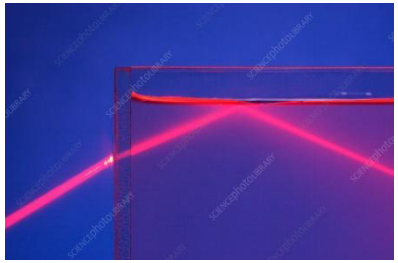
TOTAL INTERNAL REFLECTION (TIR)

What is Total Internal Reflection (TIR)?



Let's break it down:
Total: Everything
Internal: Inside
Reflection: Returns
Everything, Inside, Returns
What does that mean?
Total Internal Reflection (TIR) is when a light encounters two different materials (such as air and water), and at a specific angle, the surface acts as a mirror, and all the light is reflected. Basically, *Everything Inside Returns.*

But Why?
Light travels super fast, it is actually the fastest thing out there traveling at about 300,000,000 meters per second in air. This means it could circle the Earth about 7.5 times in 1 second (crazy!).
Although light travels that fast, it travels slower in different materials such as water or glass. In water, light travels at about 225,000,000 meters per second, or traveling around the Earth in about 5.6 seconds. This change in speed in different materials is what allows for this Total Internal Reflection to occur.

Example of Total Internal Reflection in Real Life:
Total Internal Reflection can be seen in real life, for example in waterfalls (including at Disneyland)!

For this experiment, you will need:
For the laser waterfall:

- An empty milk jug (or clear cup) with a hole made in it
- The milk jug/other container filled with water
- A laser
- Somewhere to drain the water into

Poke a hole in the side of the jug near the bottom of the container. Use your finger to plug the hole, and fill the jug with water. Place the jug so when the water drains it goes into a sink. Shine the laser on the opposite side of the jug towards the hole. Remove your finger and look closely at the laser light in the stream of water.