



Bent Toward Science

Primary Audience: 3rd – 5th

Description: Learn about the refraction of light.

Key Words: Refraction

Materials:

- Short, opaque cup
- Coin
- Water
- Battery-powered toy car or any toy with wheels (for part 2)

Instructions:

1. Place the coin in the bottom of the cup.
2. Stand or sit so that you can just barely not see the coin.
3. Slowly pour water into the cup until the coin becomes visible.

What's Going On?

With no water in the cup, light beams bouncing off the coin run into the wall of the cup before they can reach your eye. When you fill the cup with water, light beams bouncing off the coin are bent when they leave the water. The bent light beams enter your eye, allowing you to see the otherwise-invisible coin. This bending of light beams is called refraction, and it happens because light moves more slowly in water than it does in air. Another demonstration can show you just how this happens.

Instructions (Part 2):

1. Find a place where the floor/ground is made of two different materials. This might be a carpet/wood floor transition in your house or a sidewalk/grass transition outside.
2. Place the toy car or other four-wheeled toy so that one side of the car is on one surface and the other side of the car is on the other surface. Turn the car on/give it a push. What happens?

What's Going On? (Part 2)

The car moves toward one material or the other. The wheels turn more slowly on one surface (carpet or grass) than they do on the other surface (wood or sidewalk). As a result the car doesn't move in a straight line, but follows a bending path.

Light does exactly the same thing. As it moves from one material (water) to another (air), it speeds up. The result is that the light beam bends toward the slower material.

Relevant Ohio Science Content Standards:

Physical Science: 5.5