REVERSING ARROW

SCIENCE SAFETY

PLEASE follow these safety precautions when doing any science experiment.

- **ALWAYS** have an adult present.
- **ALWAYS** wear the correct safety gear while doing any experiment.
- **NEVER** eat or drink anything when performing any experiment.
- **REMEMBER** experiments may require marbles, small balls, balloons, and other small parts. Those objects could become a CHOKING HAZARD. Adults are to perform those experiments using these objects. Any child can choke or suffocate on uninflated or broken balloons. Keep uninflated or broken balloons away from children.

INGREDIENTS

- Transparent Drinking Glass
- Black Permanent Marker
- Piece of Paper
- Water

INSTRUCTIONS

STEP 1: Fill the transparent drinking glass with water.
STEP 2: Using the black permanent marker draw a horizontal arrow on the piece of paper.
STEP 3: Place the piece of paper, with the horizontal arrow, behind the transparent drinking glass, filled with water. Make sure the paper is touching the transparent drinking glass of water and observe the horizontal arrow.
STEP 4: Move the piece of paper, with the horizontal arrow, away from the transparent drinking glass of water and observe the horizontal arrow. What are the effects of placing the piece of paper, with the horizontal arrow, behind the transparent drinking glass of water?

EXPLANATION

As you move the piece of paper, with the horizontal arrow, away from the transparent drinking glass of water, the arrow appears to reverse. The light is refracted as it passes through the transparent drinking glass, the water, then through the back of the transparent drinking glass, and finally through the air to the paper with the horizontal arrow. This refraction causes the horizontal arrow to appear as if it is reversed.

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SCIENCE BACKGROUND

Light is energy you can see, which travels in a straight line until it hits an object. Once light hits an object it can reflect, refract, or absorb. Reflect mean to bounce off, refract means to bend, and absorb means to take in. Light transfers energy from one location to another. Transparent materials allow most light to pass through. Translucent materials allow some light to pass through. Opaque materials block all light from passing through.

I CAN STATEMENTS

- ✓ I can plan and conduct an investigation to determine the effects of placing objects made of different materials in the path of a beam of light.

NEXT GENERATION SCIENCE STANDARDS CONNECTION

1 – Waves: Light and Sound I Cause and Effect