Name: _____ **Date:** _____

Answer Key: Bending Beams and Magic Mirrors for 2nd Grade

Path prediction, material testing, and shadow engineering provide the hands-on logic needed to master light behavior in this advanced optics challenge.

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1. If you are designing a secret clubhouse and want to see around a corner using only two flat mirrors, how should you position the second mirror?

Answer: B) At an angle that catches the light from the first mirror

To see around a corner, the light must bounce (reflect) off the first mirror and then hit the second mirror at the correct angle to reach your eyes.

2. An engineer chooses a piece of frosted glass for a bathroom window because it is _____, meaning it lets light through but blurs the shapes.

Answer: C) Translucent

Translucent materials scatter light as it passes through, which allows brightness into a room while providing privacy by blurring images.

3. If you move a flashlight closer to an object, the shadow on the wall behind the object will get smaller.

Answer: B) False

When the light source is closer to the object, the object blocks a wider area of light rays, which makes the shadow appear larger on the wall.

4. You look through a glass of water at a drawing of an arrow pointing right, but the arrow now looks like it points left. Why does this happen?

Answer: B) Light bends as it moves through the water

This is refraction. The curved water acts like a lens, bending light rays so much that they cross over each other, flipping the image.

5. A scientist wants to block all light from entering a darkroom. They should cover the windows with an _____ material like heavy cardboard.

Answer: A) Opaque

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Opaque materials do not let any light pass through them, making them perfect for creating total darkness.

6. White light is actually made up of many different colors mixed together.

Answer: A) True

White light contains all the colors of the rainbow. We see them when light is split by things like prisms or water droplets.

7. Why does a shiny metal spoon show your reflection, but a piece of brown construction paper does not?

Answer: C) The spoon's surface is smooth enough to bounce light back evenly

Reflections require a very smooth surface so the light rays bounce back in the same pattern they arrived in.

8. If you want to make a tiny bug look much larger, you should use a _____ lens that curves outward.

Answer: C) Magnifying

Magnifying lenses (convex lenses) bend light inward to a focal point, which makes the object behind the lens appear bigger to our eyes.

9. Light travels in a wavy, zigzag line whenever it moves through the air.

Answer: B) False

Light travels in straight lines (rays) until it hits an object or moves into a different material like water.

10. You are standing in a dark room with a red ball. If there is absolutely no light, what color is the ball?

Answer: C) Black (No color)

We only see color when light bounces off an object. Without light, there is no reflection for our eyes to see, so everything appears black.