Name: _____ **Date:** _____

Answer Key: Bending Light: Third Grade Advanced Refraction and Reflection Quiz

Learners synthesize optics concepts by predicting light behavior through prisms and periscopes to master how visible energy interacts with various materials.

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1. If you are designing a periscope to see over a tall wall, how must you position the two mirrors to ensure the light reaches your eye?

Answer: A) Facing each other at 45-degree angles

To redirect light around corners, mirrors must be angled at 45 degrees so the light reflects from the top mirror down to the bottom mirror and then to the viewer.

2. A scientist notices that a beam of light passes from the air into a thick piece of clear gelatin. The light beam will _____ because it is moving into a denser material.

Answer: C) slow down

Refraction occurs because light changes speed when it moves from one medium (air) into a different medium (gelatin).

3. A triangular glass prism creates a rainbow because it reflects the sunlight off its silvered inner surface.

Answer: B) False

Prisms create rainbows through refraction (bending), not reflection. The different colors of light bend at different angles as they pass through the glass.

4. You are looking at a shiny silver spoon. Why does your reflection look upside down when you look into the 'bowl' part of the spoon?

Answer: B) The inward curve crosses the light rays

A concave surface (curved inward) reflects light rays toward a center point where they cross, flipping the image upside down.

5. When light hits a rough piece of sandpaper, it bounces off in many different directions. This specific type of reflection is called _____ reflection.

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Answer: B) diffuse

Diffuse reflection happens when light hits an uneven surface, scattering the light so you don't see a clear image like you would in a mirror.

6. A lens that is thicker in the middle than at the edges will cause light rays to spread apart.

Answer: B) False

A convex lens (thicker in the middle) actually brings light rays together to a focal point; it does not spread them apart.

7. Imagine you are trying to grab a toy at the bottom of a pool. Why does the toy appear to be in a different spot than it actually is?

Answer: B) Light bends as it moves from water to air

This is a classic example of refraction. As light leaves the water and enters the air, it bends, tricking our eyes about the toy's true depth.

8. If you shine a flashlight at a mirror at a sharp 10-degree angle, the light will bounce off the mirror at an angle of _____ degrees.

Answer: D) 10

According to the Law of Reflection, the angle of incidence (incoming light) is always equal to the angle of reflection (outgoing light).

9. An object that is 'opaque' does not allow any light to pass through it, which is why it creates a dark shadow.

Answer: A) True

Opaque materials block light entirely, whereas translucent materials let some through and transparent materials let most through.

10. Why does wearing white clothes keep you cooler in the sun than wearing black clothes?

Answer: B) White surfaces reflect most of the light

White objects reflect almost all wavelengths of visible light energy, while black objects absorb them, turning that light into heat.