Name: _____ **Date:** _____

Bending Light Like a Galactic Goalie 4th Grade Optics Quiz

Students predict how light maneuvers through periscopes and space-age prisms using engineering-based reflection and refraction models.

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1. An astronaut is using a periscope to see around a moon rock. If two mirrors are placed parallel to each other at 45-degree angles, what is the primary behavior of light being utilized?

A. Specular reflection
B. Atmospheric refraction
C. Diffuse scattering
D. Opaque absorption

2. When a beam of light travels from the air into a thick block of transparent gelatin, the light _____ and changes direction.

A. stays the same speed
B. speeds up
C. slows down
D. turns into heat

3. A magnifying glass uses a concave lens to converge light rays to a single focal point.

A. True
B. False

4. Why does a deep swimming pool appear shallower than it actually is when you look straight down into the water?

A. The water reflects the sky's image
B. Light rays bend away from the normal as they exit the water
C. The chlorine in the water acts like a mirror
D. The water absorbs the blue light first

5. A laser pointer hits a flat mirror at a 20-degree angle. According to the Law of Reflection, the light will bounce off at an angle of _____.

A. 10 degrees
B. 40 degrees
C. 20 degrees
D. 90 degrees

6. Opaque objects like a wooden door allow most light to pass through them via refraction.

A. True
B. False

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7. If you are designing a solar oven to melt chocolate using only sunlight, which tool would be most effective for gathering and focusing the light rays?

A. A flat plane mirror
B. A diverging lens
C. A concave mirror
D. A frosted glass window

8. The tool used by scientists to split white light into a rainbow by slowing down different colors at different rates is called a _____.

A. Kaleidoscope
B. Prism
C. Microscope
D. Telescope

9. Imagine you are standing in front of a mirror at a funhouse. Your reflection looks much taller and thinner than you actually are. This is likely a _____ mirror.

A. Convex
B. Concave
C. Flat
D. Transparent

10. Refraction can only occur when light moves from one medium into a different medium, such as from air into glass.

A. True
B. False