

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Bending Reality: An Optics Lab Quest for 5th Grade

Engineers solve vision problems by manipulating photons. Students synthesize knowledge of Snell's Law and focal points in this advanced light challenge.

---

**1. An underwater photographer notices that a fish looks larger and closer than it actually is. This optical illusion occurs because light changes \_\_\_\_\_ as it moves from water into the air of the camera housing.**

- A. color
- B. speed
- C. brightness
- D. volume

**2. You are designing a high-tech solar cooker. Which type of mirror would be most effective at concentrating parallel rays of sunlight into a single, high-heat focal point?**

- A. A flat plane mirror
- B. A convex mirror
- C. A concave mirror
- D. A translucent mirror

**3. True or False: A total internal reflection occurs only when light attempts to move from a more dense medium (like glass) to a less dense medium (like air) at a steep angle.**

- A. True
- B. False

**4. A scientist uses a biconvex lens to study a microscopic crystal. If the crystal is placed exactly at the focal point of the lens, what will happen to the light rays emerging on the other side?**

- A. They will scatter in all directions
- B. They will travel out in parallel lines
- C. They will flip the image upside down immediately
- D. They will turn into a rainbow spectrum

**5. Fiber optic cables transmit internet data over long distances by using the principle of \_\_\_\_\_ to keep light trapped inside a glass thread.**

- A. Absorption
- B. Shadowing
- C. Reflection
- D. Opacity

**6. True or False: If you shine a red laser through a triangular glass prism, the light will emerge as a full multi-colored rainbow.**

- A. True

Name: \_\_\_\_\_ Date: \_\_\_\_\_

B. False

**7. Imagine a periscope used in a submarine. To see an object that is above the water while the submarine is submerged, how must the two internal mirrors be positioned?**

- A. Parallel to each other at 45-degree angles
- B. Facing each other at 90-degree angles
- C. Back-to-back in the center of the tube
- D. One flat and one curved concave

**8. In a human eye, the \_\_\_\_\_ acts as a biological lens that changes shape to help you focus on objects at different distances.**

- A. Retina
- B. Crystalline lens
- C. Optic nerve
- D. Pupil

**9. True or False: Light travels faster through a diamond than it does through empty outer space.**

- A. True
- B. False

**10. If you are standing 2 meters away from a large plane mirror, what is the total distance between you and your virtual reflection?**

- A. 2 meters
- B. 0 meters
- C. 4 meters
- D. 8 meters