

Name: _____ Date: _____

Answer Key: Zap the Shadows: A 4th Grade Optics Quiz

Imagine your flashlight beam hitting a puddle or passing through a glass of juice—see how light behaves during these everyday encounters.

1. Imagine you are standing in front of a shiny metal toaster. You can see your blurry face in the metal because light is doing what?

Answer: B) Reflecting

Reflection happens when light bounces off a smooth, shiny surface like metal or a mirror, allowing you to see an image.

2. Light always travels in a perfectly straight line, even when it moves from air into a thick bowl of clear corn syrup.

Answer: B) False

False. When light moves from one material (air) into another (syrup), it slows down and bends, which is called refraction.

3. A student looks through a _____ lens, which is thicker in the middle than at the edges, to make tiny ant legs look much larger.

Answer: C) Convex

A convex lens curves outward like a football and is used in magnifying glasses to make objects appear bigger.

4. Why does a spoon sitting in a half-full glass of milk look like it is broken or disconnected at the surface of the liquid?

Answer: C) Light bends as it moves from air to milk.

This is refraction. Light changes speed and direction when it enters the milk, changing how the spoon looks to our eyes.

5. A mirror with a surface that curves inward like a cave is called a concave mirror.

Answer: A) True

True. Concave mirrors curve inward. A fun way to remember is that they look like the entrance to a 'cave'.

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6. When you see a rainbow in the mist from a garden hose, the sunlight is _____ through the tiny water droplets.

Answer: A) Refracting

Rainbows form because light refracts (bends) as it enters and leaves water droplets, which separates the white light into colors.

7. Which of these objects is designed specifically to reflect almost all of the light that hits it?

Answer: C) A bathroom mirror

Mirrors are manufactured with a silver or aluminum coating to reflect as much light as possible to create a clear image.

8. Eyeglasses use _____ to help people see more clearly by bending light so it hits the back of the eye correctly.

Answer: B) Lenses

Lenses are curved pieces of glass or plastic that use refraction to focus light and improve vision.

9. Lenses can only be made out of glass; they cannot be made out of plastic or water.

Answer: B) False

False. Lenses can be made of any clear material that can bend light, including plastic for safety glasses or even a drop of water.

10. If you shine a flashlight at a flat mirror at an angle, the light will bounce off at:

Answer: A) The exact same angle

According to the Law of Reflection, the angle at which light hits a flat surface is equal to the angle at which it bounces away.