

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

## Making Waves: A Light and Sound Adventure for 4th Grade

Students gain a detective's eye for energy by analyzing how vibrations become music and how shadows reveal the secrets of light.

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**1. Imagine you are watching a parade from a distance. You see the drummer hit the drum, but you don't hear the 'boom' until a second later. Why does this happen?**

- A. Light waves travel much faster than sound waves.
- B. Sound waves are stronger than light waves.
- C. The drum is too big for the sound to travel fast.
- D. Air blocks light waves but helps sound waves.

**2. Sound waves can travel through solid objects, like a wooden door, as well as through the air.**

- A. True
- B. False

**3. An object that allows some light to pass through but blurs the images, like a frosted bathroom window, is called \_\_\_\_\_.**

- A. Opaque
- B. Transparent
- C. Translucent
- D. Reflective

**4. When you look into a calm lake and see the trees on the shore upside down in the water, which light behavior are you observing?**

- A. Refraction
- B. Reflection
- C. Absorption
- D. Vibration

**5. If you go into outer space where there is no air, you would still be able to hear a loud explosion nearby.**

- A. True
- B. False

**6. A student blows across the top of a half-full glass bottle. To make the \_\_\_\_\_ higher, the student should add more water to shorten the air space.**

- A. Volume
- B. Amplitude
- C. Pitch
- D. Shadow

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**7. Which of these happens when a straw looks 'broken' or bent inside a glass of water?**

- A. The light waves speed up in the water.
- B. The water reflects the straw like a mirror.
- C. The light waves slow down and bend (refraction).
- D. The straw is absorbing all the green light.

**8. The height of a wave determines how much energy it has. In sound, we call this the \_\_\_\_\_, which makes the sound louder.**

- A. Frequency
- B. Wavelength
- C. Echo
- D. Amplitude

**9. When you wear a black t-shirt outside, it feels hotter because the black fabric absorbs most of the light energy from the sun.**

- A. True
- B. False

**10. Which of the following is caused by a sound wave reflecting off a distant surface and returning to your ears?**

- A. A shadow
- B. A rainbow
- C. An echo
- D. A vibration