

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

## Answer Key: Wrangle the Waves: A 1st Grade Sound and Light Challenge

Young scientists engineer solutions for dark rooms and silent signals using shadows, vibrations, and reflective surfaces during hands-on station rotations.

---

**1. You want to send a secret message across a big, sunny field using only a small mirror. How could you make the message move?**

**Answer:** B) Tilt the mirror to bounce sunlight to your friend

Light travels in straight lines and bounces off shiny surfaces like mirrors. This is called reflection, and it can be used to redirect light to a specific spot.

**2. If you are in a room with no windows and the lights are turned off, you cannot see your favorite toy because \_\_\_ is needed to see objects.**

**Answer:** C) Light

Objects are only visible when they give off their own light or when light shines on them and bounces into our eyes.

**3. True or False: If you touch a ringing bell very tightly with your hand, the sound will stop because you stopped the vibrations.**

**Answer:** A) True

Sound is created by matter vibrating back and forth. If you stop the vibration, you stop the sound wave from being created.

**4. Imagine you are building a puppet theater. Which material would be BEST for creating a very dark, clear shadow on the wall?**

**Answer:** B) Thick black cardboard

Shadows are created when an object blocks light. Opaque materials, like thick cardboard, block all light, making the sharpest shadows.

**5. To make a drum sound much louder, you should hit the drum skin with \_\_\_ force to make bigger vibrations.**

**Answer:** C) More

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

The volume of a sound depends on the energy of the vibration. More force creates larger vibrations, which we hear as a louder sound.

**6. True or False: Using a flashlight is a way to communicate words to someone far away if you use a pattern of long and short flashes.**

**Answer:** A) True

Light can be used to send signals over distances. By turning it on and off in a specific pattern, humans can share information without speaking.

**7. Two friends are talking through a 'telephone' made of two tin cans and a long string. What is carrying the sound wave from one friend to the other?**

**Answer:** B) The vibrating string

Vibrations from the person speaking travel through the string as waves until they reach the second can, allowing the other person to hear.

**8. When you put a straw into a glass of water, the straw looks like it is broken or bent. This happens because light \_\_\_ when it moves from air into water.**

**Answer:** A) Changes direction

Light travels at different speeds through different materials. When it moves from air into water, it bends (refracts), which makes objects look different.

**9. True or False: A shadow always stays the exact same size regardless of how close the object is to the light source.**

**Answer:** B) False

Changing the distance between an object and a light source changes the size of the shadow. Moving closer to the light usually makes the shadow larger.

**10. If you want to design a way to warn people a train is coming without using sound, which of these would work best?**

**Answer:** C) Flashing bright red lights

Signals can be made with light or sound. If you cannot use sound, a flashing light is an effective visual way to communicate a warning.