**Name:** _____ **Date:** _____

# Answer Key: Bouncing Beams and Booming Beats: Pre-K Wave Wizards Quiz

Tiny scientists synthesize sensory data and design imaginary noise-makers to prove light and sound travel through more than just air.

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**1. Imagine you are building a secret underwater base. If you want to talk to your fish friends using sound, which material should you send your voice through so it travels the fastest?**

**Answer:** B) Solid, heavy metal pipes

Advanced synthesis of wave speed concepts: In higher-density solids like metal, molecules are packed tightly, allowing sound vibrations to pass much faster than in liquids or gases.

**2. If you shine a flashlight at a shiny silver tray, the light will ____ off the tray and land on the ceiling.**

**Answer:** A) Bounce (reflect)

This requires the student to predict a multi-step outcome of light interacting with a reflective surface.

**3. True or False: If you could stand on the moon where there is no air, you could still hear a giant drum banging right next to you.**

**Answer:** B) False

Evaluates the fundamental physical requirement of a medium for mechanical longitudinal waves like sound.

**4. You want to create a 'Rainbow Machine.' Which of these would be the most important part to help you split white light into all the colors of the rainbow?**

**Answer:** B) A clear glass of water

Students must identify a refractive medium (water) and evaluate its potential to manipulate light waves.

**5. When you pull a rubber band very tight and pluck it, it makes a ____ sound than when the rubber band is loose.**

**Answer:** B) Higher (squeakier)

Synthesizes the relationship between tension, frequency of vibration, and perceived pitch.

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**6. True or False: Light waves can travel all the way through a thick brick wall just like they travel through a window.**

**Answer:** B) False

Assesses the ability to distinguish between transparent and opaque materials regarding electromagnetic wave transmission.

**7. If you are hiding in a room and see a shadow on the floor, what two things MUST be happening to create that shadow?**

**Answer:** B) A light shining and something blocking it

Requires reasoning about the interaction between light waves and solid objects (opacity).

**8. A loud 'BOOM' sound has waves that are very ____, while a tiny whisper has very small waves.**

**Answer:** C) Tall (high amplitude)

Introduces the concept of amplitude (wave height) and its direct correlation to volume.

**9. Think about a candle flame and a flashlight. How are they the same even though they look different?**

**Answer:** C) They both send out light waves

Scaffolding the concept of light sources regardless of the energy transformation (chemical vs. electrical).

**10. True or False: If you vibrate a string very, very slowly, it will make a sound that is too low for your ears to hear.**

**Answer:** A) True

Introduces the advanced concept that wave labels (sound) apply to vibrations even outside the human hearing range (infrasound).