

Name: _____ Date: _____

Answer Key: Vibrating Volley: A 3rd Grade Sound and Light Challenge

Students gain a deep understanding of wave behavior by analyzing how energy vibrates through different materials and bounces off surfaces.

1. Imagine you are in a dark forest at night. Why can you see a cat's eyes shining when you point a flashlight at them?

Answer: B) Light waves from the flashlight reflect off the cat's eyes.

Reflection happens when light waves hit a surface and bounce back to our eyes, allowing us to see objects.

2. Sound waves can travel through a solid wooden table even faster than they travel through the air.

Answer: A) True

Because molecules in solids like wood are packed tightly together, the energy of sound vibrations passes from one to the next very quickly.

3. When a drummer hits a drum harder, the ___ of the sound wave increases, making the sound much louder.

Answer: B) Amplitude

Amplitude measures the height or strength of a wave; higher amplitude results in more energy and a louder sound.

4. If you are whispering to a friend underwater in a swimming pool, why does it sound different than on land?

Answer: C) The medium has changed from air to liquid water.

The material a wave travels through is called the medium. Changing from air to water changes how the vibrations move.

5. A stained-glass window is considered ___ because it allows some light waves through but scatters them so you cannot see clearly.

Answer: C) Translucent

Translucent materials allow light to pass through but blur the image because the light waves are scattered in different directions.

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6. Why does a straw in a glass of water look like it is broken or shifted to the side?

Answer: C) The light waves bend as they move between air and water.

This is called refraction. Light waves change speed and bend when they move from one medium (air) into another (water).

7. In the vacuum of outer space where there is no air, an explosion would be completely silent.

Answer: A) True

Sound is a mechanical wave that requires a medium (like air or water) to travel. Without matter to vibrate, sound cannot move.

8. If a bird chirps with a very high pitch, what is true about the sound waves it is making?

Answer: A) The waves have a very high frequency.

Pitch is related to frequency. High-pitched sounds are created by waves that vibrate many times per second.

9. When you see your shadow on the sidewalk, it is because your body is ___ and blocks the light waves.

Answer: B) Opaque

Opaque objects block light waves entirely, creating a shadow where the light cannot reach.

10. White light from the sun is actually made up of all the different colors of the rainbow mixed together.

Answer: A) True

White light is a combination of many different wavelengths. When visible light is refracted through a prism or water droplets, it separates into its individual colors.