

Name: _____ Date: _____

Answer Key: Sonic Mayhem vs. The Speed of Light: A 3rd Grade Secret Science File

Third graders apply wave mechanics across 10 challenges to determine how echoes bounce off canyon walls and why submarine lights change color underwater.

1. Imagine you are deep in a canyon and yell 'Hello!' A few seconds later, you hear your voice again. What is happening to the sound waves?

Answer: B) The waves are bouncing off a flat surface

An echo is a reflection of sound. Just like a ball bounces off a wall, sound waves bounce off hard surfaces and travel back to your ears.

2. In a dark room, a flashlight beam looks like a straight line. This happens because light waves usually travel in ____.

Answer: C) straight lines

Unless light hits something or moves into a different material, it travels in a straight path called a ray.

3. True or False: Sound waves can travel through a solid wooden door.

Answer: A) True

Sound is a mechanical wave that needs a medium. It can actually travel through solids, like wood, even better than through air!

4. If you are playing a drum very softly, and then you hit it much harder, what property of the sound wave did you change?

Answer: B) Amplitude (Volume)

Amplitude is the height of the wave. Bigger vibrations create larger amplitude waves, which we hear as louder sounds.

5. When you put a straw in a glass of water, the straw looks like it is broken or bent. This is caused by light ____.

Answer: A) refraction

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Refraction is the bending of light as it passes from one material (like air) into another (like water).

6. True or False: If a space explorer's hammer hits a rock on the moon, a nearby astronaut would hear a loud 'bang' through the empty space.

Answer: B) False

Sound needs matter (like air or water) to travel. Since there is no air in space, sound waves cannot move from the hammer to your ear.

7. Which of these objects would be the BEST at reflecting light waves to create a clear image?

Answer: C) A shiny silver tray

Smooth, shiny surfaces reflect light waves at the same angle they hit, creating a reflection or image.

8. The highness or lowness of a sound, like a bird chirping versus a lion roaring, is called ____.

Answer: D) pitch

Pitch is how we perceive the frequency of sounds. Fast vibrations create high-pitched sounds, and slow vibrations create low-pitched sounds.

9. A stained-glass window looks beautiful because it lets some light through but blocks other light. This type of material is:

Answer: C) Translucent

Translucent materials allow some light to pass through but scatter it so you cannot see clearly through them.

10. True or False: Light waves travel much faster than sound waves.

Answer: A) True

Light is the fastest thing in the universe. This is why you see lightning before you hear the thunder!