

Nova's Acoustic Investigation

Learning objective: To understand how sounds are made, how they travel through a medium, and how they change in pitch and volume.

Nova the owl is conducting a scientific study in the forest. Use your knowledge of sound vibrations to complete the investigation report. For each statement, decide if it is True or False. If you select False, you must provide a scientific justification explaining the correct phenomenon.

Word bank: vibration · pitch · medium · volume · sound waves · particles

1. True or False: Sound can travel through a vacuum where there are no particles. Justify your answer. (2 marks)

2. True or False: A higher pitch sound is created when an object vibrates more slowly. Justify your answer. (2 marks)

3. True or False: When you strike a drum harder, the sound becomes louder because the vibrations have a larger amplitude. Justify your answer. (2 marks)

4. Explain why sound travels faster through a solid wooden table than through the air. (3 marks)

5. Compare and contrast the way a guitar string produces a low note versus a high note. (3 marks)

6. Justify your answer: If you were in a deep cave and shouted, why does the sound return to you after a short delay? (2 marks)

Draw: Draw a diagram showing how sound travels from a ringing bell to a child's ear. Label the 'vibrations' moving through the air particles.



Extension challenge: Design an experiment to test which material is the best sound insulator. Write a brief hypothesis explaining why you think your chosen material will be the most effective at muffling sound.