

Nova's Science Lab: The Science of Sound

Learning objective: To understand how sound is created, how it travels as vibrations, and how the volume and pitch of sounds can be changed.

Read each question carefully. Use your scientific knowledge of sound waves, vibrations, and the human ear to provide detailed answers. Remember to show your working for any calculations.

Nova the owl is stargazing and listening to the nocturnal sounds of the forest. She knows that sound is a type of energy that travels in waves through different materials, including air, water, and solids.

Word bank: vibration · medium · pitch · volume · decibels · frequency · amplitude · ear canal · eardrum

1. Nova taps a hollow log and hears a sound. Explain in your own words what is happening to the air particles to create this sound and how it reaches your ear. (3 marks)

2. If Max the monkey plays a drum, how does the volume of the sound change if he hits the drum harder? Use the term 'amplitude' in your explanation. (2 marks)

3. Finn the dolphin is swimming underwater. He makes a high-pitched click to find his way. Does sound travel faster through air or through water? Explain why. (2 marks)

4. Zara the zebra is playing a set of tuned metal bars. If she moves from a long, heavy bar to a short, thin bar, will the pitch get higher or lower? Explain your reasoning. (2 marks)

5. Kit the fox is measuring sound levels in the forest. He records a soft rustle at 20 decibels and a loud roar at 95 decibels. What is the difference in decibels between the two sounds? (1 mark)

Draw: Draw a diagram showing how a sound wave travels from a ringing bell to a person's ear. Label the 'vibrations' and the 'ear canal'.



Extension challenge: Research how different musical instruments produce sound. Choose one string instrument and one wind instrument and write a paragraph explaining how the player changes the pitch of the notes.