Nova’s Night-time Sound Investigation

Learning objective: To understand how sound is created through vibrations and how the volume and pitch of a sound can change.

Nova the owl is investigating the sounds of the forest at night. Use the word bank to complete the sentences below. Each word can be used only once. Once you have filled in the gaps, explain the scientific reason for each observation using your knowledge of vibrations.

Word bank: vibrations · pitch · medium · volume · source

1. 1. All sounds begin when an object creates _____. These travel through a _____ like air or water to reach our ears. (2 marks)

2. 2. When a drum is hit harder, the _____ of the sound increases. Explain why this happens in terms of energy. (2 marks)

3. 3. A thin, tight guitar string produces a high _____ sound compared to a thick, loose string. Why does the thickness of the string affect the sound? (2 marks)

4. 4. If Nova moves further away from the rustling leaves, why does the sound get quieter? Use the term 'sound source' in your answer. (2 marks)

5. 5. True or False: Sound can travel through a vacuum (empty space) where there are no particles. Give a reason for your answer. (2 marks)

Draw: Draw a diagram showing how sound travels from a vibrating tuning fork to an ear. Use arrows to show the movement of sound waves through the air.

Extension challenge: Max the monkey is playing a set of water-filled glass bottles. If you fill a bottle with more water, does the pitch go up or down when you strike it? Write a short prediction explaining your reasoning.