

Nova's Scientific Sound Investigation

Learning objective: To identify how sounds are made, associating some of them with something vibrating, and to investigate how pitch and volume change.

Join Nova the owl in her laboratory! Use this experiment record to document your investigation into sound. Choose one musical instrument or a vibrating object (like a ruler held against a desk) to test. Carefully observe what happens when you change the way you play it, and use your scientific vocabulary to explain your findings.

Word bank: vibration · pitch · volume · sound waves · frequency · amplitude · travel · medium

1. Hypothesis: What do you predict will happen to the sound when you increase the amount of energy used to make the object vibrate? (2 marks)

2. Method: Describe the steps you took to create a sound. How did you change the pitch, and how did you change the volume? (3 marks)

3. Observation: Explain why the object makes a sound when it vibrates. Describe what you saw or felt when the sound was produced. (3 marks)

4. Analysis: Compare and contrast how a high-pitched sound looks when represented as a wave compared to a low-pitched sound. (4 marks)

5. Justification: Why is it important to use a 'fair test' when investigating how volume changes? What variables must remain constant? (3 marks)

6. Critical Thinking: What might happen to the sound if you performed this experiment inside a vacuum where there are no air particles? Justify your answer. (4 marks)

Extension challenge: Design a new, original musical instrument that can produce both high and low pitches. Write a short paragraph explaining the scientific mechanism behind how your instrument creates these different sounds.