Nova’s Night-time Sound Symphony

Learning objective: To understand how sounds are made through vibrations and how they travel to the ear.

Read the passage carefully and answer the questions below. Use full sentences where appropriate.

Nova the barn owl sits perched high in an old oak tree, listening intently to the forest. She knows that sound is simply a series of vibrations. When a twig snaps or a leaf rustles, the object vibrates, causing the air particles around it to bump into one another. This invisible wave travels through the air, which acts as a medium, until it reaches Nova’s sensitive ears. Inside her ear, these waves cause her eardrum to vibrate, sending a signal to her brain that she interprets as a sound. Nova marvels at how different sounds have different pitches. A high-pitched squeak of a field mouse travels differently than the low, rumbling hoot of her friend Leo the lion. Even though sound is invisible, it behaves like a ripple in a pond. If Nova were to fly underwater to visit Finn the dolphin, she would notice that sound travels even faster through water than through air! Everything she hears, from the softest whisper of the wind to the loudest crash of thunder, is a result of kinetic energy moving through the world around her.

Word bank: vibration · particles · frequency · medium · eardrum · amplitude · oscillate

1. According to the passage, what happens to air particles when an object makes a sound? (2 marks)

2. Where does sound travel faster: through air or through water? (1 mark)

3. Why does the author compare sound waves to 'ripples in a pond'? (2 marks)

4. Explain why Nova might struggle to hear sounds if she were in a vacuum (a space with no air particles). (2 marks)

5. Do you agree that sound is one of the most important senses for a nocturnal animal like Nova? Justify your answer using evidence from the text. (3 marks)

Draw: Draw a diagram showing a sound wave travelling from a snapping twig to Nova the owl's ear, using arrows to show the movement of air particles.

Extension challenge: Compare and contrast how sound travels through different materials. Research and write a short paragraph explaining why sound cannot travel through space. What might happen if humans could see sound waves? Describe the world in detail.