Nova’s Scientific Report: The Mystery of Matter

Learning objective: To describe the properties of solids, liquids, and gases and explain how they change state.

Use this writing scaffold to help Nova the Owl explain how matter behaves. Use your scientific vocabulary to complete each section, ensuring you explain the movement of particles in each state.

As the sun sets, Nova gazes at the world, noting that everything around us is made of matter, existing in one of three distinct states.

Word bank: solid · liquid · gas · particles · vibrate · flow · compress · evaporation · condensation · freezing · melting · consequently · furthermore · in contrast · therefore

1. Properties of Solids: Describe how the particles in a solid are arranged and why this makes them hold their shape. Start your sentence with: Solids have a fixed shape because... (2 marks)

2. Properties of Liquids: Explain how liquids behave differently to solids. Start your sentence with: Unlike solids, liquids can flow and take the shape of their container because... (2 marks)

3. Properties of Gases: Compare the movement of particles in a gas to those in a liquid. Start your sentence with: Gases are unique because the particles move freely and... (2 marks)

4. Changing States: Explain the process of melting and evaporation. Start your sentence with: When thermal energy is added to a substance, the particles... (3 marks)

5. Justify your answer: Explain why a gas is easier to compress than a solid. Why does the particle spacing matter here? (3 marks)

6. What might happen if: Imagine we lived in a world where water could not freeze into ice. How would this affect the natural environment and the life of Bea the honeybee? (3 marks)

Extension challenge: Design a 'Particle Diagram' for a mystery substance that is transitioning from a liquid to a gas. Label the energy transfer and write a paragraph justifying why the particles are spreading further apart.