Nova’s States of Matter Challenge

Learning objective: To identify, describe, and compare the properties of solids, liquids, and gases, and explain how materials can change state.

Read each question carefully and use your knowledge of particles and states of matter to provide detailed scientific explanations. Remember to use precise vocabulary.

Word bank: solid · liquid · gas · particles · vibrate · fixed · flow · evaporation · condensation · melting · freezing

1. Nova the owl is observing an ice cube melting into a puddle. Explain what is happening to the particles in the ice as it changes from a solid to a liquid. (2 marks)

2. Compare the movement of particles in a solid versus a gas. Why does a solid keep its shape while a gas fills its container? (3 marks)

3. If you leave a bowl of water on a sunny windowsill, it disappears over time. Name this process and explain where the water molecules have gone. (2 marks)

4. Look at these materials: a brick, orange juice, and helium in a balloon. Categorise each as a solid, liquid, or gas and explain one property for each. (3 marks)

5. During a science experiment, steam hits a cold mirror and turns into water droplets. What is the name of this state change, and why does it happen when the steam touches the cool surface? (2 marks)

Draw: Draw a scientific diagram showing the arrangement of particles in a solid, a liquid, and a gas. Use small circles to represent the particles in each state.

Extension challenge: Research the 'Water Cycle'. Write a short paragraph explaining how water constantly changes state between a liquid and a gas as it moves through the environment.