

The Secrets of Matter with Bea the Bee

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

Read the passage below carefully. Use your scientific knowledge to answer the questions that follow. For the Greater Depth questions, ensure you provide clear reasoning for your answers.

Bea the honeybee loves visiting the orchard to study the world around her. She explains that everything is made of tiny particles. These particles behave differently depending on their state of matter. Solids, like the wooden hive, have particles packed tightly together, meaning they keep their shape. Liquids, such as the nectar Bea collects, have particles that can flow and slide past one another, allowing them to take the shape of their container. Gases are the most energetic; in the air Bea flies through, the particles are far apart and move rapidly in all directions. Temperature changes can transform these states. When the morning frost—a solid—warms up, it melts into liquid water. If the sun heats that water further, it may evaporate into an invisible gas called water vapour. Conversely, if the air cools, that vapour can condense back into liquid dew on the petals. By observing these changes, we can see how matter is constantly transforming all around us in the natural world.

Word bank: solid · liquid · gas · particles · melt · evaporate · condense · state of matter

1. Identify the three states of matter mentioned in the passage and give one example of each from the text. (2 marks)

2. What happens to the movement of particles when a substance changes from a solid to a liquid? (2 marks)

3. Why does the author describe the gas particles in the air as being 'energetic'? (2 marks)

4. Explain why a liquid is able to take the shape of a container, whereas a solid cannot. (2 marks)

5. Justify why it is important for scientists to understand how matter changes state when predicting the weather. What might happen to the water cycle if temperatures never changed? (3 marks)

Draw: Draw three boxes labelled 'Solid', 'Liquid', and 'Gas'. Inside each box, draw how you imagine the particles are arranged and moving.



Extension challenge: Compare and contrast the properties of steam and ice. Create a scientific poster that explains the water cycle using the terms 'evaporation' and 'condensation' to teach a younger student how water transforms.