

Nova's States of Matter Challenge

Learning objective: To identify and describe the properties of solids, liquids, and gases, and observe how materials change state when they are heated or cooled.

Join Nova the barn owl on an exploration of the particles that make up our world. Read each question carefully and select or write the best answer. Good luck!

Answer Key: 1.C, 2.True, 3.Gas, 4.B, 5.True, 6.Evaporation, 7.D, 8.False, 9.Solid, 10.Freezing. Greater Depth Guidance: Ensure pupils use scientific terminology such as 'particles', 'vibrate', 'flow', and 'energy' in their justifications.

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

**1. Which state of matter has particles that are tightly packed and vibrate in a fixed position?
A) Gas B) Liquid C) Solid* D) Plasma (1 mark)**

2. True or False: Liquids take the shape of the container they are poured into. (1 mark)

3. Which state of matter can be compressed (squashed) easily because the particles are far apart? (1 mark)

4. When you heat an ice cube, what process occurs? A) Condensation B) Melting* C) Freezing D) Evaporation (1 mark)

5. True or False: Gases have a fixed volume. (1 mark)

6. What is the name of the process when a liquid turns into a gas due to heat? (1 mark)

7. Which of these is an example of a gas? A) A stone B) Milk C) Honey D) Water vapour* (1 mark)

8. True or False: Materials always stay in the same state of matter regardless of temperature. (1 mark)

9. If you leave a puddle of water out on a sunny day, it disappears. What state of matter was it, and what state did it become? (1 mark)

10. What is the process called when water turns into ice in a freezer? (1 mark)

Draw: Draw three boxes. In the first, draw how particles look in a solid (neat rows). In the second, draw a liquid (random but close). In the third, draw a gas (spread far apart).



Extension challenge: 1. Explain why water droplets form on the outside of a cold glass of juice on a warm day. 2. Compare and contrast the movement of particles in a solid versus a gas. 3. Justify why a metal spoon might feel cold to the touch even if the room is warm. 4. What might happen to the particles in a liquid if you were to remove all the heat energy? 5. If you had a sealed balloon, why does the air inside push against the rubber? 6. Design an experiment to prove that 'air' is a state of matter even though we cannot see it.