

The Particle Model of Matter

Time: 20 min. 6 questions.

Instructions

Answer each question in complete sentences where needed. You may draw a quick sketch to help you think, but your written answer is what will be marked. Do your best to explain your thinking using the particle model of matter.

Questions

1. Which of the following best describes the arrangement of particles in a solid?

- A) Particles are far apart and moving quickly in all directions
- B) Particles are close together and vibrate in place
- C) Particles are spread out with no attractive forces between them
- D) Particles are sliding past each other with large spaces between them

[\(Details\)](#)

2. Explain why a gas can be squeezed into a smaller space (compressed) much more easily than a liquid. Use the word "particles" in your answer.

[\(Details\)](#)

3. True or false: Attractive forces between particles are strongest in gases and weakest in solids.

[\(Details\)](#)

4. Priya has two metal blocks that are exactly the same size (same volume), but one feels much heavier than the other. What physical property is she comparing?

- A) Compressibility
- B) Volume
- C) Density
- D) State

[\(Details\)](#)

5. A juice box holds 250 mL of juice. How many millilitres of juice would be in 3 juice boxes?

[\(Details\)](#)

6. Describe what happens to the particles in a liquid as it changes state, in terms of how close together they are and how they move compared to particles in a solid.

[\(Outcome\)](#)

Curriculum coverage

Question	Outcome alias
1	Details
2	Details
3	Details
4	Details

5	Details
6	Outcome

Answer key

1. **B) Particles are close together and vibrate in place.** In solids, particles stay near each other and vibrate but do not move around freely ([Details](#)).
2. **Sample answer: A gas compresses easily because its particles are far apart with large spaces between them, so those spaces can be squeezed smaller. A liquid's particles are already close together with little space left to squeeze.** Compressibility depends on how much space there is between particles ([Details](#)).
3. **False.** Attractive forces between particles are strongest in solids and weakest in gases, which is the opposite of the statement ([Details](#)).
4. **C) Density.** Density compares the mass of an object to its volume, so two objects with the same volume but different masses have different densities ([Details](#)).
5. **750 mL.** Three juice boxes of 250 mL each gives $250 + 250 + 250 = 750$ mL ([Details](#)).
6. **Sample answer: In a solid, particles are close together and only vibrate in place. When it becomes a liquid, the particles gain more space between them and can slide past each other instead of staying fixed.** This describes the change in particle arrangement and movement between the solid and liquid states ([Outcome](#)).