

The Particle Model of Matter

Time: 20 min. 6 questions.

Instructions

Answer each question using what you have learned about particles, states of matter, and physical properties like mass, volume, and density. Read each question carefully, and show your thinking for the short answer and numeric questions.

Questions

1. In which state of matter are the particles closest together and vibrating in place, rather than sliding past each other or spreading apart?

- A) Gas
- B) Liquid
- C) Solid
- D) Steam

([Knowledge](#))

2. Describe how the arrangement and movement of particles in a liquid are different from the arrangement and movement of particles in a gas.

([Skills](#))

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

([Knowledge](#))

4. A metal cube has a mass of 54 grams and a volume of 6 millilitres. What is its density, in grams per millilitre?

([Knowledge](#))

5. Which SI unit would you use to measure the volume of a liquid?

- A) grams
- B) kilograms
- C) millilitres
- D) metres

([Knowledge](#))

6. Using ideas about particles, explain why a gas can be squeezed into a much smaller volume more easily than a solid can.

([Knowledge](#))

Curriculum coverage

Question	Outcome alias
1	Knowledge
2	Skills
3	Knowledge

4	Knowledge
5	Knowledge
6	Knowledge

Answer key

1. C) Solid. In solids, particles sit close together and vibrate in place rather than moving freely ([Knowledge](#)).
2. In a liquid, particles are separated by small spaces and can slide past each other, while in a gas, particles are separated by large spaces and move constantly in all directions ([Skills](#)).
3. False. Attractive forces between particles are strongest in solids and weakest in gases, the opposite of what the statement says ([Knowledge](#)).
4. 9 grams per millilitre. Density equals mass divided by volume, so 54 grams divided by 6 millilitres equals 9 g/mL ([Knowledge](#)).
5. C) Millilitres. Millilitres (mL) and litres (L) are the SI units used for the volume of a liquid ([Knowledge](#)).
6. A gas is easier to compress because its particles have large spaces between them, so those spaces can be squeezed smaller. A solid's particles are already packed tightly together with almost no space to reduce ([Knowledge](#)).