

The Particle Model of Matter

Time: 20 min. 6 questions.

Instructions

Answer each question using what you have learned about the particle model of matter, states of matter, and physical properties such as mass, volume, and density. Read each question carefully, and show your thinking where it helps explain your answer.

Questions

1. Which statement best describes the particles in a solid?

- A) They are far apart and move quickly in all directions.
- B) They are close together and vibrate in place.
- C) They slide past each other with spaces between them.
- D) They have no movement at all.

[\(Details\)](#)

2. In your own words, explain why a gas can be squeezed into a smaller space (compressed) much more easily than a liquid can.

[\(Details\)](#)

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

[\(Details\)](#)

4. Object A has a mass of 36 g. Object B has the same volume as Object A but has a mass of 12 g. What is the difference in mass, in grams, between Object A and Object B?

[\(Details\)](#)

5. Which of the following is the best description of volume?

- A) The amount of matter in an object
- B) The amount of space an object takes up
- C) The comparison of an object's mass to its volume
- D) The ability of a gas to be squeezed into a smaller space

[\(Details\)](#)

6. A block of wood floats when placed in water. Using the particle model of matter, explain what this tells you about the density of the wood compared to the density of water.

[\(Details\)](#)

Curriculum coverage

Question	Outcome alias
1	Details
2	Details
3	Details
4	Details

5	Details
6	Details

Answer key

1. B) They are close together and vibrate in place. In solids, particles stay close together and vibrate in place rather than sliding or moving freely ([Details](#)).
2. A gas can be compressed easily because its particles are separated by large spaces, so those spaces can be reduced when the gas is squeezed. A liquid's particles are already close together with little space between them, so it resists compression much more ([Details](#)).
3. False. Attractive forces between particles are strongest in solids and weakest in gases, which is the opposite of the statement ([Details](#)).
4. 24 g. Subtracting the mass of Object B (12 g) from the mass of Object A (36 g) gives $36 - 12 = 24$ g ([Details](#)).
5. B) The amount of space an object takes up. This matches the definition of volume, measured in units such as millilitres or litres ([Details](#)).
6. The wood is less dense than water. Since the wood floats, its particles have less mass packed into the same volume compared to the water's particles, making the wood less dense and able to float in the denser liquid ([Details](#)).