

The Particle Model of Matter

This sheet checks what you know about how tiny particles behave in solids, liquids, and gases, and how the particle model of matter explains states of matter and other physical properties. It connects to the guiding question about explaining states of matter using the particle model ([Guiding question](#)) and to the learning outcome on investigating the particle model in relation to physical properties ([Outcome](#)).

Exercises

1. Matching: State of matter to particle arrangement

Draw a line from each state of matter to the description that matches it.

State of Matter	Particle Description
A) Solid	1) Particles are far apart and move quickly in all directions
B) Liquid	2) Particles are close together and only vibrate in place
C) Gas	3) Particles are close but can slide past each other

([Details](#))

2. Fill in the blanks

Use the word bank to complete each sentence. Word bank: strongest, weakest, spaces, moving

- a) Particles of matter are always _____.
- b) There are _____ between particles of matter.
- c) Attractive forces between particles are _____ in solids.
- d) Attractive forces between particles are _____ in gases.

([Details](#))

3. Multiple choice

A block of wood has a mass of 40 g and a certain volume. A block of the same size made of iron has a mass of 200 g. Which statement is true?

- A) The wood is denser than the iron.
- B) The iron is denser than the wood.
- C) The wood and iron have the same density.
- D) Density cannot be compared because they are different materials.

Circle your answer. ([Details](#))

4. Short answer

Explain why gases can be squeezed into a smaller space (compressed) much more easily than liquids. Use the words "particles" and "spaces" in your answer.

([Details](#))

5. Draw and label

In the box below, draw three circles to represent particles in a gas. Show them spread far apart, and add arrows to show that they are moving in all directions.

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[\(Details\)](#)

6. Applying the concept

A student places a small plastic ball into a container of water. The ball floats on top.

- a) Is the plastic ball more dense or less dense than water? _____
- b) Using the particle model, explain what "less dense" means in terms of mass compared to volume.

[\(Details\)](#)

Answer key

1. A, 2, B, 3, C, 1
2. a) moving b) spaces c) strongest d) weakest
3. B) The iron is denser than the wood.
4. Gas particles have large spaces between them, so pushing them closer together reduces the empty space. Liquid particles are already close together with little space left to compress.
5. Drawing should show three particles spread far apart with arrows pointing in different directions, showing constant movement in all directions.
6. a) less dense b) Less dense means that for the same volume, the ball's particles add up to less mass than the same volume of water.