

The Particle Model of Matter

This worksheet checks what you know about the particle model of matter and how it explains solids, liquids, and gases ([Outcome](#), [Knowledge](#)). You will also practise the physical properties that particles help explain, including mass, volume, density, and compressibility ([Knowledge](#)).

Exercises

1. Matching: States of Matter

Match each state of matter to the correct description of how its particles are arranged and moving. Write the correct letter in the blank.

State of Matter	Letter
Solid	_____
Liquid	_____
Gas	_____

- A) Particles are separated by large spaces and move constantly in all directions.
- B) Particles are close together and vibrate in place.
- C) Particles are separated by spaces and can slide past each other.

2. Multiple Choice: Attractive Forces

Circle the correct answer.

Which statement about attractive forces between particles is correct? ([Knowledge](#), [PDF p.6](#))

- A) Attractive forces are strongest in gases and weakest in solids.
- B) Attractive forces are strongest in solids and weakest in gases.
- C) Attractive forces stay exactly the same in every state of matter.
- D) Attractive forces only exist in liquids.

3. Draw the Particles

In each box below, draw dots to show how particles are arranged in that state of matter. Show the spacing between particles as accurately as you can ([Knowledge](#), [Skills](#)).

Solid	Liquid	Gas

4. Fill in the Blank

Use these words to complete the sentences: mass, volume, density, compressibility.

- a) The amount of space that a solid, liquid, or gas takes up is called its _____.
- b) The amount of matter in an object is called its _____.
- c) Comparing the mass of an object to its volume tells you its _____.

d) The ability of a liquid or gas to shrink in volume when pushed on is called

[\(Knowledge\)](#)

5. Vocabulary Matching

Draw a line or write the matching letter to connect each term to its correct definition.

Term	Definition
1. Mass	A) Comparison of an object's mass to its volume
2. Volume	B) Amount of matter in an object, measured in g or kg
3. Density	C) Ability of a liquid or gas to reduce in volume under pressure
4. Compressibility	D) Amount of space an object takes up, measured in mL, L, or cm^3

[\(Knowledge\)](#)

6. Applying the Particle Model

A scuba tank holds air that has been squeezed into a much smaller space, but a water bottle full of liquid water is very hard to squeeze smaller, even when you press on it firmly.

Explain why gases can be compressed much more easily than liquids. Use the words "particles" and "space" in your answer.

[\(PDF p.6, Knowledge\)](#)

Answer Key

1. Solid = B, Liquid = C, Gas = A
2. B) Attractive forces are strongest in solids and weakest in gases.
3. Solid box should show dots close together in a fixed pattern; liquid box should show dots separated by spaces and able to slide past each other; gas box should show dots spread far apart moving in all directions.
4. a) volume, b) mass, c) density, d) compressibility
5. 1-B, 2-D, 3-A, 4-C
6. Gases can be compressed because there is a lot of space between gas particles, so pressure can push them closer together. Liquid particles are already close together with very little space between them, so they cannot be pushed much closer.