

The Particle Model of Matter

This worksheet checks your understanding of how the particle model explains solids, liquids, and gases, and how it connects to physical properties like mass, volume, density, and compressibility ([Outcome](#), [Details](#)). Work through each exercise carefully and use full sentences where asked.

Exercises

1. Matching: States of Matter

Draw a line to match each state of matter to its correct particle description ([Details](#)).

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 vibrate in place
C) Gas	3) Particles are close but can slide past each other

2. Multiple Choice

In which state of matter are the attractive forces between particles the strongest? ([Details](#))

- A) Gas
- B) Liquid
- C) Solid
- D) The forces are equal in all three states

3. Fill in the Blanks

Complete each sentence using words from the box.

Word box: mass, volume, density, compressibility

- a) The amount of space that a solid, liquid, or gas takes up is called its _____. ([Details](#))
- b) The amount of matter in an object is called its _____. ([Details](#))
- c) _____ compares the mass of a substance to its volume. ([Details](#))
- d) The ability of a liquid or gas to shrink in volume when pressure is applied is called _____. ([Details](#))

4. Short Answer

Explain, in your own words, why a gas can be squeezed into a smaller space (compressed) much more easily than a liquid. Use the words "particles" and "spaces" in your answer. ([Outcome](#), [Details](#))

5. Compare and Explain

A block of wood and a block of steel are the same size (same volume). The steel block has a much greater mass than the wood block.

- a) Which block is denser: the wood or the steel? _____ ([Details](#))
- b) If you placed the wood block in water, would it most likely float or sink? Explain your answer using the idea of density. ([Details](#))

6. Diagram and Label

Below are three empty boxes. In Box 1, draw dots to represent particles in a solid. In Box 2, draw dots to represent particles in a liquid. In Box 3, draw dots to represent particles in a gas. Underneath each box, write one word that describes how close together the particles are (close, spaced, or far apart). ([Details](#))

Box 1 (Solid):

Label: _____

Box 2 (Liquid):

Label: _____

Box 3 (Gas):

Label: _____

Answer Key

1. A, 2, B, 3, C, 1
2. C) Solid
3. a) volume, b) mass, c) Density, d) compressibility
4. Sample answer: A gas can be compressed easily because its particles have large spaces between them, so pushing the particles closer together reduces the volume a lot. A liquid's particles are already close together with little space left to squeeze.
5. a) The steel is denser. b) Sample answer: The wood would likely float because it is less dense than water; an object that is less dense than the liquid it is placed in will float.
6. Box 1 should show dots close together in a fixed pattern (label: close); Box 2 should show dots close but not in a fixed pattern (label: spaced); Box 3 should show dots far apart (label: far apart).