

The Particle Model of Matter

The particle model explains how matter behaves by describing the arrangement and movement of tiny particles ([Details](#)). By investigating solids, liquids, and gases, you can see how particle movement and spacing affect the properties of different materials ([Outcome](#)).

Exercises

1. Particle Arrangement in States of Matter

Draw a simple diagram of how particles are arranged in each state. Use dots to represent particles.

State	Your diagram
Solid	
Liquid	
Gas	

2. Matching Particle Properties

Match each description on the left to the state of matter on the right.

Description	State
A) Particles vibrate in place, close together	1) Gas
B) Particles move rapidly in all directions with large spaces between them	2) Liquid
C) Particles slide past each other with spaces between them	3) Solid

3. Movement and Attractive Forces

In which state of matter are attractive forces between particles strongest? _____

In which state of matter are attractive forces between particles weakest? _____

Explain why attractive forces are weaker in gases than in solids.

4. Comparing Density

Two blocks have the same volume. Block A has a mass of 50 g. Block B has a mass of 80 g.

Which block is denser? _____

How do you know? _____

5. Compressibility

You squeeze a sealed syringe filled with water. The water does not compress much. You squeeze a sealed syringe filled with air. The air compresses easily.

Use the particle model to explain why air is more compressible than water.

6. Multiple Choice: Particle Movement

Which statement best describes why a gas spreads to fill a container?

- A) Gas particles are attracted to the walls of the container.
- B) Gas particles are always moving in all directions with large spaces between them.
- C) Gas particles are vibrating in place and pushing outward.
- D) Gas particles are sliding past each other slowly.

Answer Key

1. Solid: dots tightly packed together (no spaces between); Liquid: dots with small spaces between them; Gas: dots spread far apart with large spaces between them.
2. A, 3 (Solid), B, 1 (Gas), C, 2 (Liquid).
3. Strongest in solids; weakest in gases. Gases have large spaces between particles, so attractive forces cannot pull particles together as strongly as they do in solids where particles are close together.
4. Block B is denser. Block B has more mass in the same volume.
5. Air has large spaces between particles, so particles can move closer together when squeezed. Water particles are already close together with little space, so they cannot compress much.
6. B.