

The Particle Model of Matter

The particle model explains how all matter is made of tiny particles that are always moving and have spaces between them ([Knowledge, PDF p.1](#)). In this worksheet, you will show what you know about how particles arrange and move in solids, liquids, and gases, and how this explains the properties of matter ([Outcome](#)).

Exercises

1. **Draw and label the particles.** Use dots to represent particles. Draw three boxes below and show how particles are arranged in each state of matter. Label each box as solid, liquid, or gas.

Solid: _____ Liquid: _____ Gas: _____

2. **Match each state of matter to its particle behaviour.** Write the letter of the correct answer.

State of Matter	Particle Behaviour
Solid	A) Particles are far apart and move in all directions
Liquid	B) Particles are close together and vibrate in place
Gas	C) Particles have spaces between them and slide past each other

Solid: ____ Liquid: ____ Gas: ____

3. **Complete the sentences about attractive forces.** Use the words *strongest* or *weakest*.

In solids, the attractive forces between particles are _____.

In gases, the attractive forces between particles are _____.

These forces affect how tightly the particles are packed together.

4. **Read the scenario and explain using the particle model.**

A sponge is a solid, but it has many tiny air pockets inside it. Use what you know about particles to explain what happens when you squeeze a sponge.

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5. **Multiple choice: Density and particles.**

Which statement best explains why a rock sinks in water but a piece of wood floats?

- A) The rock has larger particles than the wood.
- B) The rock has more mass packed into the same volume, making it denser than water.
- C) The rock's particles are moving faster than the water's particles.
- D) The rock has stronger attractive forces than wood.

Answer: ____

6. **Apply the particle model to a real change.**

When ice melts into liquid water, the particles begin to move more and have more space between them. What happens to the attractive forces between the particles as ice melts? Explain your answer.

Answer Key

1. Student drawings should show: Solid, dots very close together in a fixed pattern; Liquid, dots close but with small gaps, arranged loosely; Gas, dots far apart, spread throughout the space.
2. Solid: B, Liquid: C, Gas: A
3. In solids, the attractive forces between particles are *strongest*. In gases, the attractive forces between particles are *weakest*.
4. When you squeeze a sponge, you push the air out of the tiny air pockets inside it. The air (a gas) takes up space, so removing it makes the sponge appear smaller. The solid material of the sponge itself does not change.
5. B
6. The attractive forces between the particles become weaker as ice melts. The particles gain energy and move faster, so they can overcome some of the attractive forces holding them in a fixed solid structure. This allows them to slide past each other as a liquid.