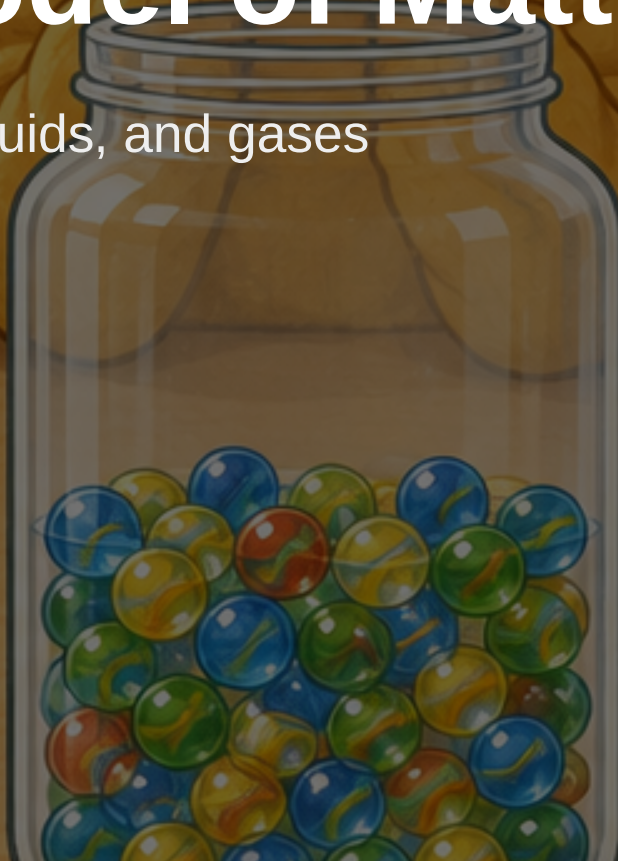
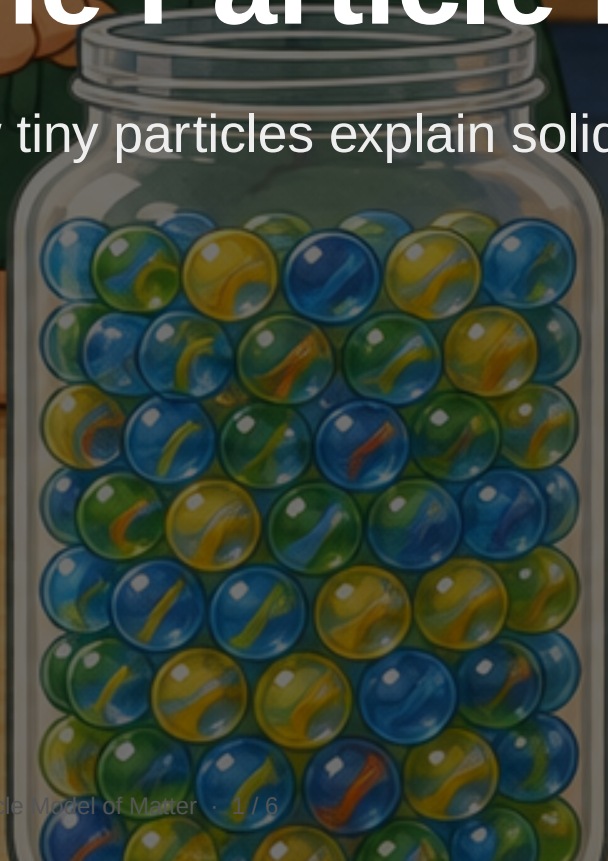


The Particle Model of Matter

How tiny particles explain solids, liquids, and gases



Learning Intentions and Success Criteria

- I can explain that all matter is made of tiny particles that are always moving.
- I can describe how particles are arranged and move in solids, liquids, and gases.
- I can relate attractive forces between particles to how tightly packed they are.
- I can use the particle model to explain physical properties like mass, volume, and density.
- Guiding question for today: How can states of matter and other physical properties be explained using the particle model of matter?

Three States, Three Particle Patterns

Solid

Particles are close together and vibrate in place, held by strong attractive forces.

Liquid

Particles have spaces between them and can slide past each other.

Gas

Particles are far apart and move constantly in all directions, with the weakest attractive forces.

Physical Properties Explained by Particles

Mass and Volume

Mass is the amount of matter in a solid, liquid, or gas, measured in grams (g) or kilograms (kg). Volume is the amount of space matter takes up, measured in millilitres (mL) or litres (L).

Density and Compressibility

Density compares an object's mass to its volume. Something denser than a liquid sinks in it; something less dense floats. Compressibility is how much a liquid or gas can shrink in volume under pressure.

Why Some Things Float and Others Sink

1

Measure mass

Use a balance scale and SI units to find the mass of an object or liquid.

2

Measure volume

Use appropriate tools and SI units to find how much space it takes up.

3

Compare density

The greater the mass compared to volume, the higher the density.

4

Predict float or sink

A substance less dense than the fluid around it floats; a denser one sinks.

Wrapping Up the Particle Model

Today we learned that all matter is made of tiny, moving particles with spaces between them, and that the arrangement, movement, and attractive forces between these particles explain the differences between solids, liquids, and gases. We also connected particle arrangement to physical properties like mass, volume, density, and compressibility.

If you heated a solid, what do you think would happen to the spacing and movement of its particles? We will explore this question in our next lesson on heating and cooling matter.