The Three States of Matter Explained

KS2 SCIENCE Ages 10-12 ⏰ 3 min read

What Are the Three States of Matter?

Everything in the world is made of tiny, invisible things called **atoms** and **molecules**. These particles can arrange themselves in three different ways, creating three **states of matter**: **solids**, **liquids**, and **gases**. Understanding the difference between them helps us make sense of the world around us.

Solids

A **solid** is something that has a fixed shape and takes up a specific amount of space. Think of your desk, a pencil, or an ice cube. The particles in a solid are packed very tightly together and vibrate in place, but they don't move around freely. This is why solids keep their shape no matter where you put them.

Think of it like a car park where every car has its own marked space. The cars can vibrate a little, but they stay in their spots and don't move around.

Liquids

A **liquid** flows and takes the shape of its container. Water, juice, and milk are all liquids. The particles in a liquid are still close together, but they have more freedom to move around than solids do. This is why liquids can pour and spread out, but they also stay at the bottom of a container because gravity pulls them down.

Think of it like a crowd of people moving through a corridor. They stay fairly close together, but they can move around and change positions easily.

Gases

A **gas** is invisible and spreads out to fill all the space available. Air, steam, and oxygen are gases. The particles in a gas are very far apart and move extremely fast in all directions. They have no fixed shape and no fixed volume—they'll escape if you don't contain them.

Think of it like a bunch of children running around a playground with no boundaries. They spread everywhere and don't stay in one spot.

How Do They Change?

Matter can change from one state to another. When you freeze water, you change it from a liquid into a solid (ice). When you heat ice, it melts back into liquid water. If you boil water, it becomes **steam**—a gas. These changes happen because heat energy affects how fast the particles move. The faster they move, the more space they need, which is why heating causes matter to expand and change states.

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