What Happens When Chemicals React with Each Other

KS3 Ages 11-14 ⏰ 3 min read

What Is a Chemical Reaction?

A **chemical reaction** happens when **chemicals** (also called **substances**) meet and interact with each other. During this process, the atoms and molecules rearrange to create completely new substances. This is different from just mixing things together — it's a permanent change where something brand new forms.

Think about baking a cake. When you mix flour, eggs, and sugar, you're just combining ingredients. But once you heat them in the oven, a **chemical reaction** takes place. The heat causes the ingredients to bond in new ways, and you end up with something completely different — cake! You can't separate it back into flour and eggs anymore.

Think of it like: Lego blocks snapping together. When you build with Lego, you're rearranging the blocks into a new shape. A chemical reaction is similar — atoms are like Lego blocks that snap together in new combinations to build new "structures" (substances).

How Do Chemical Reactions Work?

Every substance is made of tiny particles called **atoms** and **molecules**. During a chemical reaction, these particles break apart and reconnect in different ways. The bonds between atoms are like invisible glue — when they break and form again, new materials are created.

For example, when you burn wood, the **carbon** and **oxygen** in the wood react together to create ash, carbon dioxide, and heat. The wood is gone forever, replaced by completely different substances.

Energy and Chemical Reactions

Something important happens during every chemical reaction: **energy** is either released or absorbed. Some reactions give off heat (like burning or explosions), while

others need heat to happen (like cooking). Some reactions even release light, like a sparkler on Bonfire Night!

Think of it like: A battery powering a toy. Just as a battery releases energy to make a toy move, chemical reactions release energy that can create heat, light, or movement.

Why Does This Matter?

Chemical reactions happen everywhere around us. Digestion is a chemical reaction in your stomach. Photosynthesis is how plants turn sunlight into food using a chemical reaction. Batteries work through chemical reactions. Even your body's cells use chemical reactions to stay alive.

Understanding chemical reactions helps scientists develop new medicines, create safer fuels, and even design better materials for space rockets. Every time something changes permanently — rusting iron, cooking food, or a firework exploding — a chemical reaction has taken place.