The Different Ways Energy Can Be Stored

KS4 PHYSICS ENERGY Ages 11-14 ⏰ 3 min read

What is Stored Energy?

Energy doesn't just disappear — it can be saved up and released later when we need it. Think of **stored energy** as nature's way of keeping power in reserve. Every time you charge your phone, fill a car with petrol, or wind up a toy, you're storing energy. Understanding the different ways energy hides away is crucial to understanding how the world works.

Think of it like a savings account at a bank — you put money in when you have it, and take it out when you need it.

Chemical Energy

Chemical energy is energy stored in the bonds between atoms and molecules. When these bonds break, they release energy. **Batteries** store chemical energy — when you connect them to a device, a chemical reaction happens inside, and that releases electrical energy. **Fossil fuels** like petrol, coal, and natural gas are also examples. They store millions of years' worth of sunlight, captured by plants and animals long ago. When we burn them, the chemical bonds break and release heat and light.

Think of it like a chocolate bar — the energy is locked inside until you eat it and your body breaks it down.

Gravitational Potential Energy

Gravitational potential energy is energy stored in objects because of their height. The higher something is, the more energy it has waiting to fall. A boulder on a mountain, water held behind a dam, or a book sitting on a high shelf all have this type of stored energy. When they fall, that stored energy turns into **kinetic energy** — the energy of movement.

Think of it like holding a ball above the ground — the higher you hold it, the more energy it has to bounce when you drop it.

Elastic Potential Energy

Elastic potential energy is energy stored in objects that can stretch or compress, like springs, rubber bands, and trampolines. When you pull back a catapult or wind up a clock spring, you're storing elastic energy. Release it, and that energy does work — launching a projectile or moving the clock's hands.

Thermal and Electrical Energy

Thermal energy is stored heat. A hot cup of tea or a fire contains thermal energy that can warm things up. **Electrical energy** can be stored in batteries and capacitors, ready to power our devices. **Nuclear energy** is stored in the nuclei of atoms — this is the most concentrated form of energy we know about, used in power stations and weapons.

Every object around us is storing some form of energy. Understanding these different types helps us see why energy is so important and how it powers everything from our homes to our bodies.