Energy Transfer: How Power Moves Around

KS4 PHYSICS ENERGY TRANSFER Ages 11-14 ⏰ 3 min read

What Is Energy Transfer?

Energy is the ability to do work or make change happen. When energy moves from one place to another—or changes from one type to another—we call this **energy transfer**. Every time something happens in the world, energy is on the move.

Think about a ball rolling down a hill. At the top, it has **potential energy** (stored energy because of its position). As it rolls down, that energy transfers into **kinetic energy** (the energy of movement). The energy doesn't disappear; it just changes form.

Think of it like money in your pocket. The cash is still valuable whether it's in your wallet, on a table, or in a shop till—it hasn't vanished, just moved to a different place.

Energy Always Changes Form

Energy loves to transform. A light bulb takes **electrical energy** and converts it into **light energy** and **heat energy**. When you eat food, your body converts **chemical energy** (stored in the food) into **movement energy** to run and jump.

Even a candle does this brilliantly. The **chemical energy** in the wax combines with oxygen to create **heat** and **light**. Nothing is wasted; it all transfers somewhere.

The Problem: Energy Loss

Here's where things get tricky. When energy transfers, some always escapes as **heat**. This is called **energy loss**, and it happens everywhere.

When you ride your bike, friction between the brakes and wheels creates heat—that's wasted energy that could have kept you moving faster. Light bulbs feel hot because they're losing energy as heat instead of producing light.

Think of it like trying to pass a ball through a crowded hallway. Some people stop the ball, slow it down, or drop it—the energy of your throw gets lost in the chaos.

The Golden Rule: Nothing Disappears

Here's the really important bit: while energy changes form and some seems to get lost as heat, the **total amount of energy never disappears**. Scientists call this the **Law of Conservation of Energy**. That heat energy is still energy; it's just spread out and harder to use.

Understanding energy transfer helps us make machines more **efficient**—meaning they waste less heat and work better. Solar panels, electric cars, and wind turbines all work because scientists understand exactly how energy moves and changes.