How Circuits and Electronics Power Everyday Products

KS4 DESIGN & TECHNOLOGY KS3 SCIENCE Ages 11-14 ⏰ 3 min read

What is a Circuit?

A **circuit** is a closed loop that lets **electricity** flow from a power source (like a battery) through different components and back again. Without a complete loop, electricity cannot flow, and nothing works. Think of it like a race track—the electricity is a car that needs a path to travel around.

Think of it like a water pipe system. Water only flows when the pipes connect in a circle. If you break the pipe anywhere, the water stops flowing.

Key Parts of a Circuit

Every circuit has three main parts. The **power source** (battery or mains electricity) provides the energy. **Conductors** like copper wires carry the electricity safely. **Components** such as lights, motors, and microchips use that electricity to do useful work. Some circuits also have **switches** to turn electricity on and off, and **resistors** to control how much electricity flows.

How Electronics Use Circuits

Your **phone**, **television**, **games console**, and **computer** all contain thousands of tiny circuits working together. When you press a button, you close a switch. This completes the circuit, electricity flows, and something happens—a light turns on, a sound plays, or an image appears.

Think of it like a video game with power-ups. Each component is like a different power-up. When electricity reaches each one, it activates a different ability.

Circuits in Your Home

Your home uses circuits too. Light switches control circuits that power bulbs. Your washing machine, microwave, and refrigerator all have circuits inside them. The **National Grid** carries electricity from power stations through wires to homes and

buildings across the country. Inside your home, **circuit breakers** protect your circuits from damage if something goes wrong.

Digital Circuits

Modern devices use **digital circuits** that work with tiny computer chips called **microchips** or **integrated circuits**. These contain millions of switches so small you cannot see them without a microscope. They process information using **binary code**—just **0s and 1s**—which represent electricity being off or on. This is how your phone displays messages, plays music, and connects to the internet.

Understanding circuits helps us design better products, use electricity safely, and fix broken devices. Every time you use something electric, a circuit is working hard behind the scenes!