How Computers Connect to Each Other on the Internet

KS3 Ages 11-14 ⏰ 3 min read

How Do Computers Talk to Each Other?

Every time you watch a video, send a message, or play an online game, your computer is talking to other computers around the world. But how does this actually happen? Computers need three main things to connect: **physical connections**, an **addressing system**, and **rules for sharing data**.

Physical Connections: The Internet's Highways

Computers connect through cables and wireless signals. Most long-distance connections use **fibre optic cables** — incredibly thin glass tubes that carry information as light. These cables are buried underground and run under the ocean between continents. When you connect at home, you probably use **Wi-Fi** (wireless) or **Ethernet cables** (wired connections) to reach your **router**, which then connects to your **Internet Service Provider (ISP)**.

Think of it like a postal system. Your home is like a house, your router is like the local post office, and the fibre optic cables are like the roads and delivery trucks that carry letters between post offices around the world.

Finding the Right Computer: IP Addresses

With billions of computers online, how does your message reach the right one? Every computer on the internet has a unique address called an **IP address** — short for **Internet Protocol address**. It looks something like **192.168.1.5**. When you send information, it includes the IP address of where it's going, just like a letter needs a postal address.

Think of it like a phone number. Just as every phone has a unique number so friends can call you, every computer has a unique IP address so other computers can find it.

Sending Data in Packages

Your computer doesn't send information all at once. Instead, it breaks it into tiny chunks called **data packets**. Each packet contains a piece of your message, the sender's IP address, the receiver's IP address, and instructions for reassembly. Special computers called **routers** read these addresses and forward packets along the best route to their destination — sometimes through dozens of different paths.

Once all the packets arrive at the destination computer, they're reassembled in the correct order to create the original message, video, or image.

Why This System Works So Well

This method is reliable because if one route gets congested or fails, packets can take different paths and still arrive safely. It's also efficient because computers can share the same cables and wireless networks without interfering with each other. The **internet** itself isn't owned by anyone — it's a global network of interconnected computers following the same rules, which is why anyone anywhere can connect.