



How does Wi-Fi work?

KS2

KS3

Ages 7-14 ⌚ 4 min read

Your Wi-Fi router is basically a tiny radio station sitting in your hallway. And your phone, laptop, and tablet are all radios that can pick up its signal.

Radio waves are invisible ripples of energy — the same kind of thing that carries music to your car stereo or signals to your TV. Wi-Fi just uses a very specific type of radio wave to carry internet data instead.

Imagine passing notes in class — but instead of folded paper, the notes are invisible and travel through the air at nearly the speed of light. Your router writes the note (sends data), throws it, and your device catches it. Then your device writes back. This all happens billions of times a second.

The router connects to the internet through a physical cable (usually coming through the wall from outside your house). It then broadcasts that connection as radio waves. Any device nearby that knows the password can tune in, send requests, and get information back.

Why does it get slower far away?

Radio waves spread out as they travel. The further you are from the router, the weaker the signal. Walls absorb some of it too. That's why you get one bar of Wi-Fi in the garden and five bars in the same room as the router.

2.4GHz vs 5GHz — what's the difference?

These are different "channels" of radio wave. 2.4GHz travels further but carries less data. 5GHz is faster but doesn't reach as far. Modern routers often broadcast both at once — your device picks whichever is better for where you are.