



What is an Algorithm and Why Computers Need Them

KS4 COMPUTER SCIENCE

Ages 11-14 ⌚ 3 min read

What is an Algorithm?

An **algorithm** is a set of step-by-step instructions that tells a computer exactly what to do. It's like a recipe—if you follow the steps in the right order, you'll get the right result every time. Algorithms are invisible, but they're everywhere: when you search Google, watch YouTube, or play a video game, algorithms are working behind the scenes.

Think of it like following a recipe to bake a cake. You read the ingredients, mix them in the right order, bake for the right time, and you get a cake. If you skip steps or do them in the wrong order, the cake won't turn out right. Computers follow algorithms the same way.

Why Do Computers Need Algorithms?

Computers don't think like humans do. They can't guess or use common sense. They need **precise instructions** to know what to do next. Without algorithms, computers would be useless—they'd just sit there waiting for someone to tell them every single tiny step.

Algorithms solve problems by breaking them into smaller, manageable steps. When you search for "cute cats" on Google, an algorithm searches through billions of web pages in seconds, finds the ones about cute cats, and shows you the best results first. Without an algorithm telling the computer how to do this, it would take forever—or it couldn't happen at all.

Think of it like giving directions to a friend. You don't just say "go to the park." You say "turn left at the traffic light, walk **200 metres**, turn right at the shops, and the park is on your left." Computers need exactly the same level of detail.

Real-Life Examples

Sorting algorithms help Netflix decide which shows to recommend to you based on what you've watched. **Search algorithms** help Google find what you're looking for. **Navigation algorithms** help your phone work out the fastest route home.

Every time something happens on a computer or phone, an algorithm is probably running. Even simple things like turning off your screen or charging your battery use algorithms to decide when and how.

Why Should You Care?

Understanding algorithms helps you see how computers actually work. It also helps you think about problems logically, step-by-step, which is useful for **problem-solving** in real life. Learning to code means learning to write your own algorithms, and that's a superpower in today's world.