

Kit's Clever Computing: Understanding Algorithms

Learning objective: To understand that an algorithm is a precise, step-by-step set of instructions used to complete a task or solve a problem, and to identify the importance of logical order.

Read each question carefully and use your knowledge of computing logic to answer. Remember, in programming, the order of instructions is vital for success!

Word bank: Algorithm · Sequence · Input · Output · Debug · Logical · Step-by-step

1. Kit the fox is writing an algorithm to make a jam sandwich. He has written these steps: 1. Put bread on plate. 2. Spread jam. 3. Put two slices of bread together. 4. Open the jar. Why is this algorithm currently broken? Explain what needs to happen to make the sandwich successfully. (2 marks)

2. Define the term 'algorithm' in your own words. Why is it important for a computer that these instructions are written in a specific order? (2 marks)

3. Imagine you are programming a robot to walk from the classroom door to your desk. List three specific, logical instructions you would need to include to ensure it doesn't bump into a chair. (3 marks)

4. If a computer follows an algorithm but produces the wrong result, what is the process of finding and fixing the mistake called? (1 mark)

5. Look at this simple algorithm: Step 1: Count out £2.50. Step 2: Give money to the shopkeeper. Step 3: Receive item. Step 4: Say thank you. Is this a sequence? Explain why a computer would struggle if Step 4 happened before Step 2. (2 marks)

Draw: Draw a flowchart showing the steps to brush your teeth. Use a rectangle for each action and arrows to show the sequence.

A large, empty rectangular box with a thin black border, intended for drawing a flowchart. It occupies the upper half of the page below the instructions.

Extension challenge: Write a short algorithm for a 'Robot Teacher' to explain how to sharpen a pencil. Test your algorithm on a partner—if they miss a step, 'debug' your instructions to make them clearer!