

Kit's Computing Challenge: Designing an Algorithm

Learning objective: To design and write a clear, step-by-step algorithm to solve a specific task.

Kit the fox needs your help! Imagine you are teaching a robot how to complete a daily task. Use this frame to break the process down into logical, sequential steps. Remember to be precise, as robots follow instructions exactly as they are written.

To create a successful algorithm, one must carefully break down a complex task into small, manageable instructions that a computer can follow.

Word bank: First · Subsequently · Following that · In the meantime · Finally · Sequence · Input · Process · Output · Loop · Conditional · Precisely

1. What is the specific task you are programming your robot to complete? Explain why this task needs a clear sequence of steps. (2 marks)

2. List the first three steps of your algorithm. Remember to start with a verb (e.g., 'Move', 'Open', 'Pick up'). (3 marks)

3. If the robot encounters a problem (e.g., something is in the way), what 'If... then...' instruction would you add to help it? (3 marks)

4. Describe one part of your algorithm that could be turned into a 'loop' to save time or space. (2 marks)

5. How would you 'debug' your algorithm if the robot does not complete the task correctly the first time? (2 marks)

Extension challenge: Refine your algorithm by creating a flowchart using symbols for 'start', 'process', and 'decision'. Can you identify any potential bugs in your logic?