

Kit's Coding Logic: The Robot Adventure

Learning objective: To understand and use logical reasoning to explain how algorithms work and to detect and correct errors (debugging) in programming sequences.

Kit the Fox is building a robot to tidy up his woodland den. Below is a list of steps in the robot's programme. However, the sequence is scrambled, and there is a 'bug' (an error) in the logic. First, reorder the steps logically (1-5). Second, identify the bug in step 3 and explain how to fix it so the robot reaches the toy box successfully.

Word bank: Sequence · Algorithm · Debugging · Instruction · Logic · Variable

1. 1. Reorder these instructions so the robot moves from the 'Start' position to the 'Toy Box': [] Move forward 3 squares. [] Pick up the ball. [] Turn 90 degrees left. [] Move forward 2 squares. [] Drop ball in toy box. (5 marks)

2. 2. Look at the instruction: 'Pick up the ball'. If there is a wall between the robot and the ball, why will the programme fail? (2 marks)

3. 3. What is the definition of 'debugging' in the context of computer programming? (2 marks)

4. 4. If the robot was programmed to 'Move forward 10 squares' but the room is only 5 squares long, what type of error has occurred? (2 marks)

5. 5. Why is it important for a programmer to use a clear, logical sequence when writing an algorithm? (2 marks)

Draw: Draw a simple grid map of a den with a 'Start' square, a 'Toy Box' square, and one obstacle in between. Draw a path showing how Kit's robot avoids the obstacle to reach the box.



Extension challenge: Imagine your robot has a 'sensor' that detects walls. Write a new, single instruction using the word 'IF' (e.g., 'IF there is a wall, then...') to help your robot navigate the obstacle you drew.