

Kit's Computing Challenge: Mastering Algorithms

Learning objective: To understand how to design, write, and debug programs by creating and refining algorithms.

Read each question carefully. Use your knowledge of coding logic to solve these puzzles. Remember that an algorithm is a step-by-step set of instructions to complete a task.

Kit the fox is writing a computer program to help a robot navigate through a forest maze. The robot needs to avoid obstacles and reach the goal. Use your logic skills to help Kit complete the code.

Word bank: algorithm · debug · sequence · variable · loop · input · output

1. Define the term 'algorithm' in your own words. Why is the order of steps important in a sequence? (2 marks)

2. Kit has written a short program for the robot: 1. Move forward 2. Turn left 3. Move forward 4. Jump. If the robot hits a tree at step 3, what is the process of fixing this error called? (1 mark)

3. Imagine the robot needs to pick up 5 apples. Instead of writing 'Pick up apple' five times, what coding structure could you use to make the code more efficient? (2 marks)

4. Look at this sequence: Input 'Red Button' -> Output 'Sound'. If the user presses the 'Blue Button', which is not in the code, what might happen? Explain your reasoning. (2 marks)

5. Write a short algorithm using 4 steps to help Kit make a cup of tea, ensuring the sequence is logical. (2 marks)

Draw: Draw a flowchart showing the steps for a simple task, such as brushing your teeth or making a sandwich. Use standard shapes like rectangles for actions and diamonds for decisions.



Extension challenge: Research what a 'variable' is in coding. Write an example of how a variable could be used in a game, such as keeping track of a player's score or health points.