

## Grade 4 Computing Assessment: Algorithms and Logic

*Learning objective: To understand, design, and debug algorithms, and use logical reasoning to explain how they work.*

Read each question carefully. Use your knowledge of sequences, variables, and debugging to answer. Show your working where necessary.

Kit the fox is creating a new computer game. He needs to write a set of clear, step-by-step instructions for his game character to follow to collect shiny tokens in a maze. If the character hits a wall, Kit must change the instructions to fix the error.

*Word bank: Algorithm · Sequence · Debug · Selection · Variable · Loop · Input · Output*

**1. Define the term 'algorithm' in your own words. Why is it important for the steps in an algorithm to be in the correct order? (2 marks)**

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**2. Kit writes an algorithm to make a character move forward, turn left, and jump. If the character jumps into a hole instead of over it, what is the process of finding and fixing this error called? (1 mark)**

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**3. Explain the difference between a 'sequence' and a 'loop' in an algorithm. Give an example of when you might use a loop. (3 marks)**

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**4. Kit wants his game to count how many tokens a player collects. What do we call a placeholder in code that stores information like a 'score' or a 'total'? (2 marks)**

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**5. Look at this simple algorithm for making a cup of tea: 1. Boil water. 2. Put tea bag in mug. 3. Pour water. 4. Remove tea bag. 5. Add milk. Identify one potential flaw or missing step in this algorithm that might cause a problem. (2 marks)**

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**6. Describe a 'selection' (an 'if-then' statement) that Kit could use in his game to decide if the player has won the level. (4 marks)**

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**7. Imagine you are designing a robot to tidy a messy bedroom. Write a detailed algorithm of at least 6 steps to complete this task. Ensure your steps are precise so the robot does not make a mistake. (5 marks)**

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**Draw: Draw a flowchart showing the steps for a simple task, such as brushing your teeth or making a sandwich. Use clear boxes for actions and diamond shapes for any decisions.**



*Extension challenge: Total: /25. Challenge: Can you write a piece of code-like pseudocode that includes a loop and a variable to track how many times a character jumps?*