

# Grade 4 Computing: Understanding Coding and Algorithms

*Learning objective: To assess knowledge of algorithms, debugging, selection, and the use of variables in coding.*

Read each question carefully before answering. Ensure your explanations are clear and use correct computing terminology. Total marks available: 25.

Kit the fox is building a new computer program to help his friends organize their library books. He has written a set of instructions for the computer to follow, but he has noticed that the program sometimes crashes when a book is missing from the shelf. Kit is now checking his code line by line to find the error.

*Word bank: algorithm · bug · debugging · variable · selection · sequence · loop*

**1. Define the term 'algorithm' in your own words. (2 marks)**

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**2. Kit finds an error in his program. What is the technical term for this error, and what is the process of fixing it called? (2 marks)**

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**3. Explain what 'selection' means in coding. Give an example of how a programr might use an 'if/then' statement. (4 marks)**

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**4. Why do programrs use 'variables' in their code? Provide an example of what a variable might store in a game. (4 marks)**

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**5. Describe the difference between a 'sequence' and a 'loop' in a computer program. (4 marks)**

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6. Kit is designing a system where a user enters the price of a book in £. If the price is over £10, the computer displays 'Expensive'. If it is £10 or less, it displays 'Budget'. Write the logic for this program using pseudocode. (4 marks)

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7. Imagine you are designing a computer game character. Describe a set of instructions (an algorithm) for your character to follow to move across the screen, reach a treasure chest, and increment a score variable by 1. (5 marks)

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**Draw:** Draw a flowchart that shows a simple decision process: 'Is it raining?'. Use a diamond shape for the decision and rectangles for the actions.



*Extension challenge: Total: /25. Challenge: Research what a 'nested loop' is and explain how it differs from a standard loop.*