

Year 5 Computing: Mastering Sequences and Logic

Learning objective: To assess understanding of programming concepts including algorithms, selection, repetition, and debugging.

Read each question carefully. Use your knowledge of programming logic to provide clear, detailed answers. Ensure your explanations are precise and use technical terminology where appropriate.

Kit the fox is designing a computer game for the BookFlik forest. To help the characters navigate the woods, Kit writes a series of instructions. He creates a 'selection' block that checks if the weather is raining; if it is, the character must open an umbrella. If the sun is shining, the character wears sunglasses. Kit also uses a 'loop' to ensure the character keeps walking until they reach the riverbank.

Word bank: algorithm · debug · variable · loop · selection · sequence · syntax · input

1. Define the term 'algorithm' in your own words and explain why it is essential for Kit to get the order of his instructions correct. (2 marks)

2. Kit's character is failing to open the umbrella even when it is raining. Describe the process of 'debugging' and how Kit might identify the error in his code. (3 marks)

3. Compare and contrast a 'fixed loop' and a 'conditional loop' (until). Give an example of when you would use each in a computer game. (4 marks)

4. Explain why 'selection' (if/then/else statements) is vital for making a game feel interactive rather than just a simple list of repeated actions. (4 marks)

5. What might happen if a programmer forgets to include an exit condition in a loop? Explain the likely impact on the program's performance. (3 marks)

6. Justify your answer: If you were designing a game where a character needs to collect 10 items, would you use a variable to keep track of the score? Explain your reasoning. (4 marks)

7. Extended Writing: Imagine you are designing a program for a robot to tidy a library. Write a set of instructions using logical sequences, selection, and loops. Explain why your chosen structure is the most efficient way to complete the task. (5 marks) (5 marks)

Draw: Draw a flowchart that represents the logic of Kit's weather-checking program. Use standard symbols: a rectangle for instructions, a diamond for the 'selection' (if/else) question, and arrows to show the flow of the program.



Extension challenge: Total: /25. Challenge: Design a piece of pseudocode for a program that calculates the cost of books. If a book costs £5.00 or more, apply a 10% discount. If it costs less, charge the full price. Explain how you would test this code to ensure it is accurate.