

Kit's Computing Challenge: Designing an Algorithm

Learning objective: To design, write, and debug a program that accomplishes a specific goal, using sequence, selection, and repetition.

Use this writing frame to plan your own computer program. Think about the steps required to solve a problem and how you would explain these steps clearly to a computer.

To create a successful program, I must first break down my complex task into a logical series of precise instructions.

Word bank: algorithm · sequence · selection · repetition · debug · variable · input · output · consequently · furthermore · subsequently · on the other hand

1. Problem Identification: What specific problem or task will your program solve, and why is an algorithm the best way to approach it? Start with: The goal of my program is to... (2 marks)

2. The Algorithm: Write the step-by-step sequence of instructions for your program. How will you ensure the computer follows these in the correct order? Start with: My algorithm begins by... (3 marks)

3. Using Selection: Explain how you will incorporate 'if... then...' statements to allow your program to make decisions. Start with: To add selection, I will include a condition where... (3 marks)

4. Using Repetition: How will you use a loop to make your code more efficient instead of repeating lines? Start with: I will use a loop to repeat the action of... (2 marks)

5. Debugging Strategy: What might happen if your program does not work as expected, and how would you identify the error? Start with: If the program fails to execute correctly, I will debug it by... (3 marks)

6. Evaluation: Justify your choice of structure. Why is your chosen sequence the most effective way to solve the problem? Start with: My approach is effective because... (4 marks)

Extension challenge: Imagine you are explaining your program to Kit the fox. Write a paragraph explaining what might happen if you changed one of your loops into a selection statement. Would your program still function as intended? Justify your answer.