

Class 4 Computing Assessment: The Logic of Algorithms

Learning objective: To demonstrate understanding of algorithms, debugging, and logical sequencing.

Read each question carefully. Use the word bank if you need help with technical terms. Write your answers clearly in the spaces provided.

Kit the fox is building a robotic assistant to help organise the BookFlik library. To make the robot move correctly, Kit must write a precise set of instructions. If the instructions are in the wrong order, the robot might bump into a bookshelf! Kit also uses 'decomposition' to break big tasks into smaller, manageable steps.

Word bank: Algorithm · Sequence · Debug · Loop · Program · Error · Decomposition

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

2. 2. Kit has written an instruction that makes the robot spin in circles forever. What is the technical name for an instruction that repeats itself, and why might Kit want to use one? (3 marks)

3. 3. The robot tries to pick up a book but drops it instead. What is the process of finding and fixing this mistake called? (2 marks)

4. 4. Look at these steps for making a cup of tea. Put them in the correct sequence by numbering them 1 to 4: [] Pour water, [] Add tea bag, [] Boil the kettle, [] Remove tea bag. (4 marks)

5. 5. Explain what 'decomposition' means. Give an example of how you would use decomposition to tidy up your bedroom. (4 marks)

6. 6. Imagine you are teaching a friend how to draw a square using only three commands: 'Move forward', 'Turn right 90 degrees', and 'Repeat'. Write the algorithm for drawing the square. (5 marks)

Draw: Draw a simple flowchart showing the steps to brush your teeth. Use a diamond shape for a decision (like 'Is the brush wet?') and rectangles for your actions.



Extension challenge: Total: /25. Challenge: If you were programming a robot to walk from your desk to the classroom door, what obstacles might you need to include in your algorithm to ensure the robot doesn't crash?