

Kit's Computing Challenge: The Art of Debugging

Learning objective: To understand the process of debugging by identifying, correcting, and explaining errors in algorithms.

Use this writing frame to describe how you would debug a sequence of instructions. Think like Kit the fox—stay calm, be logical, and look for the smallest error that caused the big problem.

When Kit the fox discovered his robot was spinning in circles instead of walking to the tree, he knew it was time to put on his debugging goggles.

Word bank: algorithm · sequence · logical error · syntax error · systematically · consequently · predictable outcome · refinement · troubleshooting · iteration

1. The Problem: Describe the specific error you found in the code. What was the robot or program supposed to do, and what happened instead? Start with: 'Initially, the program failed because...' (2 marks)

2. The Investigation: Explain the steps you took to locate the bug. How did you test the sequence? Start with: 'To isolate the error, I decided to...' (3 marks)

3. The Solution: Justify the correction you made to the code. Why was this the most effective way to fix the issue? Start with: 'I corrected the fault by... because...' (3 marks)

4. Reflective Analysis: Compare and contrast how the program functioned before and after your intervention. Start with: 'Before the correction, the output was..., but now...' (4 marks)

5. Evaluation: What might happen if you had ignored this small bug? Explain the potential impact on the overall performance of the algorithm. Start with: 'If the bug had remained, the program would likely have...' (4 marks)

6. Future Prevention: How could you design your code differently next time to avoid similar errors? Start with: 'To ensure greater accuracy in future, I would...' (4 marks)

Extension challenge: Imagine you are explaining the concept of debugging to a younger student who has never written code before. Write a persuasive paragraph explaining why making mistakes is actually a vital part of the learning process for a computer scientist.