

Kit's Code-Cracking Challenge: Mastering Debugging

Learning objective: To understand what a bug is in computer programming and to develop the skills to identify, explain, and correct errors (debug) in a sequence of instructions.

Read each scenario carefully. Use your knowledge of algorithms and logic to spot the errors. Remember, a 'bug' is a mistake in a program that prevents it from running as intended.

Word bank: algorithm · bug · debugging · sequence · logic · error · predict · test

1. Kit the fox has written an algorithm for a robot to make a jam sandwich: 1. Pick up bread. 2. Put on plate. 3. Eat the bread. 4. Spread jam. Explain why this sequence contains a 'bug' and what the robot would do wrong. (2 marks)

2. You are debugging a program that is meant to draw a square. The code currently says: 'Move forward 5 steps, Turn right 90 degrees'. Why will this code fail to create a square, and how would you fix it? (2 marks)

3. Define the term 'debugging' in your own words. Why is it an essential skill for a computer programmer to have? (2 marks)

4. Look at this sequence for brushing teeth: 1. Put toothpaste on brush. 2. Wet the brush. 3. Brush teeth. 4. Rinse mouth. If the brush falls on the floor between step 1 and step 2, what type of error has occurred and how should the algorithm be updated? (2 marks)

5. Max the monkey says: 'If my code doesn't work, I delete it and start again.' Using what you know about debugging, why is it better to find and fix the bug rather than deleting the whole program? (2 marks)

Draw: Draw a 'Bug' as a funny creature that lives inside a computer, and then draw a 'Debugging Tool' that you would invent to catch it.



Extension challenge: Write a short algorithm for making a cup of tea (or hot chocolate). Once written, swap with a partner and intentionally insert one 'logical bug' for them to find and fix.