Kit’s Code-Cracking Challenge

Learning objective: To understand algorithms, debugging, and the basic principles of logical programming sequences.

Help Kit the fox fix his buggy computer programs! Read each question carefully and circle the best answer. Good luck, young programmers!

Answer Key: 1: C, 2: True, 3: Sequence, 4: B, 5: False, 6: Debug, 7: A, 8: True, 9: D, 10: Loop. Explanation: An algorithm is a precise set of instructions. Debugging is the process of identifying and removing errors. A sequence is the order in which steps occur. A loop allows a set of instructions to repeat automatically.

Word bank: Algorithm · Debug · Sequence · Loop · Input · Variable · Bug

1. What do we call a set of step-by-step instructions designed to complete a specific task? A) A glitch, B) A memory, C) An algorithm*, D) A hardware. (1 mark)

2. True or False: A 'bug' is an error in a computer program that prevents it from running correctly. (1 mark)

3. What term describes the specific order in which instructions must be carried out to reach the correct outcome? (1 mark)

4. If Kit wants his character to move forward 10 steps five times, which command is most efficient? A) Forward, Forward, Forward, Forward, Forward, B) A loop*, C) An input, D) A variable. (1 mark)

5. True or False: Computers are smart enough to guess what you mean even if your instructions are in the wrong order. (1 mark)

6. What is the name of the process used to find and fix errors in a program? (1 mark)

7. Which of these is an example of an 'input'? A) Typing on a keyboard*, B) A monitor screen, C) A printer, D) A computer case. (1 mark)

8. True or False: An algorithm must be precise and clear for a computer to follow it accurately. (1 mark)

9. What happens if a sequence of instructions has a missing step? A) The program runs faster, B) The program runs correctly, C) The program changes colour, D) The program fails or produces the wrong result*. (1 mark)

10. Which programming concept allows a block of code to repeat itself until a condition is met? (1 mark)

Draw: Draw a flowchart showing the steps to make a cup of tea or brush your teeth. Remember to use different shapes for the start, the steps, and the end!

Extension challenge: 1. Explain why it is important for a programmer to test their code multiple times. 2. Compare and contrast an 'algorithm' with a 'recipe' for baking a cake. 3. Justify why using a 'loop' is more efficient than repeating a command manually. 4. What might happen if you swapped the order of two steps in a sequence? 5. If you were designing a robot to tidy a room, what are the first three instructions you would include? 6. Design a 'variable' that could store a player's score in a game and explain why it is useful.