Kit's Coding Quest: Mastering Algorithms

Learning objective: I can create, debug, and explain simple programs using logical instructions.

About 30 minutes. Grown-up tip: Ask your child to explain the steps of making their breakfast as if they were programming a robot.

Read each question carefully. An algorithm is a set of instructions to complete a task. Debugging means finding and fixing a mistake in your code. Example: To make a sandwich, my algorithm is: 1. Get bread. 2. Spread butter. 3. Add cheese. If I forgot the butter, that is a bug!

Kit the fox is building a robotic toy to help clear autumn leaves from the garden path. Kit needs to write a sequence of instructions to make the robot move from the oak tree to the garden shed. The robot can move Forward, Turn Left, or Turn Right.

Word bank: Algorithm · Debug · Sequence · Program · Code · Instruction

1. 1. What is an 'algorithm'? (1 mark) (1 mark)

2. 2. Kit wrote a program for the robot: [Forward, Forward, Turn Left, Forward]. If the shed is straight ahead, what is the 'bug' in this sequence? (2 marks) (2 marks)

3. 3. The robot is at the start. Write a sequence of 4 instructions to move the robot one square forward and then turn right. (4 marks) (4 marks)

4. 4. Why is it important to put your instructions in the correct order? Give a reason. (4 marks) (4 marks)

5. 5. A new robot needs to pick up a ball. It must: Move forward, Pick up ball, Move backward. Write the sequence. Then, explain how you would check if it works. (4 marks) (4 marks)

6. 6. Imagine you are teaching a friend how to make a cup of tea. Write a step-by-step algorithm. Ensure your instructions are clear and in the right order. (5 marks) (5 marks)

7. 7. If a program does not do what you want, what should you do first? (5 marks) (5 marks)

Draw: A friendly fox wearing a small computer headset, standing next to a simple path in a garden with an oak tree.

Extension challenge: Total: /25. Challenge: Can you create an algorithm for a robot to draw a square? Remember, a square has four equal sides and four right-angle turns!

I did it! Name: _____ Date: _____

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