

Kit's Coding Challenge: Mastering Algorithms in Scratch

Learning objective: To design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems and using sequence, selection, and repetition (loops).

Read each question carefully. Use your knowledge of the Scratch interface, block categories, and computational thinking concepts to solve the puzzles below. Refer to the word bank if you are unsure of technical terminology.

Kit the fox is creating a digital game where a character must navigate a forest maze. To make the game work, Kit needs to use precise instructions, ensure the code is bug-free, and use efficient loops to save space in the script area.

Word bank: Algorithm · Sprite · Variable · Loop · Debugging · Conditional · Sequence · Broadcast

1. Kit wants a character to move forward 10 steps, turn 90 degrees, and repeat this pattern 4 times to create a square. Explain why using a 'Repeat' loop is more efficient than placing the individual blocks 4 times. (2 marks)

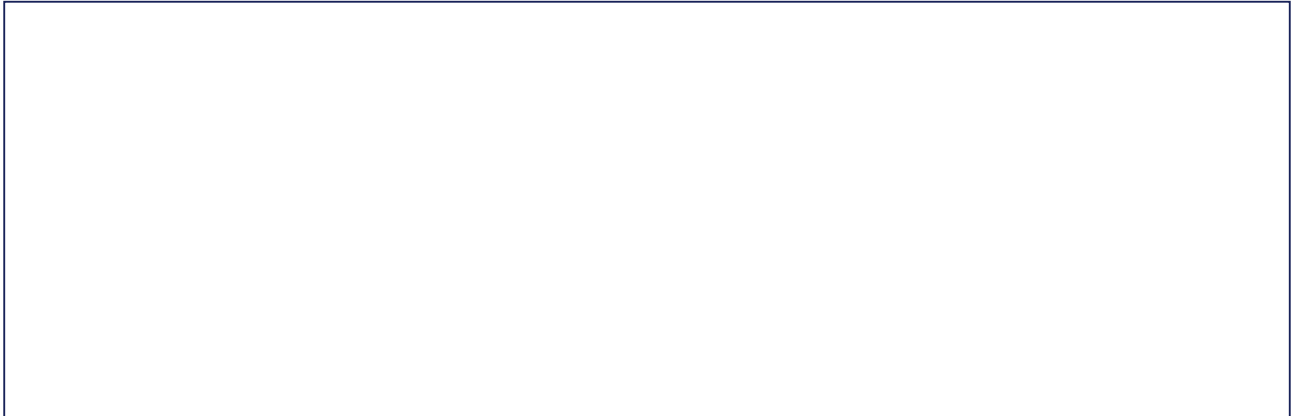
2. Define the term 'Debugging' in the context of your Scratch project. Why is it an essential skill for a programmer to possess? (2 marks)

3. If Kit writes a script that says 'If touching colour green, then play sound', which category of block is being used and what is the function of this block? (2 marks)

4. Compare and contrast a 'Forever' loop with a 'Repeat until' loop. In what scenario would you choose one over the other? (3 marks)

5. Justify your answer: If your character is not moving when you click the green flag, what are the first two things you should check in your script? (2 marks)

Draw: Draw a flowchart that shows the logic for Kit's character jumping over a log. Use standard shapes: an oval for 'Start', rectangles for actions (e.g., 'Move forward'), and a diamond for decisions (e.g., 'Is space bar pressed?').



Extension challenge: Imagine you are creating a game where a sprite collects coins. Create a piece of pseudocode to track the score using a variable. Then, explain what might happen if you forget to include a 'Reset score to 0' block at the start of your game. How would this impact the user experience?