

Kit's Clever Computing Challenge: Mastering Algorithms

Learning objective: To design, write and debug programs that accomplish specific goals, controlling or simulating physical systems by solving problems through logical algorithms.

Help Kit the fox organise his computer logic! Read each question carefully and select or write the correct answer. Remember: an algorithm is just a step-by-step set of instructions to complete a task.

Answer Key: 1. A (Algorithm), 2. False, 3. Debugging, 4. C (Sequence), 5. True, 6. D (Loop), 7. True, 8. B (Selection), 9. Variable, 10. False. Explanation: An algorithm must be precise. Debugging is the process of finding and fixing errors in code. A loop repeats a command, while selection (if/then statements) allows a program to make a decision.

Word bank: Algorithm · Sequence · Debugging · Input · Output · Variable · Loop · Selection

1. **1. What is the correct term for a precise, step-by-step set of instructions to complete a task? A) Algorithm*, B) Animation, C) Account, D) Abacus (1 mark)**
2. **2. True or False: An algorithm does not need to be in a specific order to work correctly. (1 mark)**
3. **3. What is the specific word used to describe the process of finding and fixing mistakes in your computer code? (1 mark)**
4. **4. Which term describes the order in which instructions are carried out? A) Sorting, B) Skipping, C) Sequence*, D) Stacking (1 mark)**
5. **5. True or False: If you want a computer to repeat an action five times, you would use a 'loop'. (1 mark)**
6. **6. Which block would you use to create a repetitive action in your code? A) If/Then, B) Variable, C) Input, D) Loop* (1 mark)**
7. **7. True or False: A computer will always follow your instructions exactly as written, even if the algorithm is flawed. (1 mark)**
8. **8. Which term describes a decision-making instruction, such as 'If it is raining, take an umbrella'? A) Sequence, B) Selection*, C) Storage, D) Scanning (1 mark)**

9. 9. What do we call a placeholder in code that stores information, such as a score in a game or the price of an item like £5? (1 mark)

10. 10. True or False: Computers are capable of 'guessing' what you mean if your algorithm is incomplete. (1 mark)

Draw: Draw a flowchart that shows the algorithm for making a piece of toast, using 'start', 'end', and boxes for each step of the process.



Extension challenge: 1. Explain why 'debugging' is considered the most important part of the coding process. 2. Compare and contrast an algorithm used for a computer program versus a recipe for baking a cake. 3. Justify why computers require such high levels of precision in their instructions. 4. What might happen if an algorithm had an infinite loop? 5. Design an algorithm to help Max the monkey count his collection of £1 coins. 6. If you were teaching a robot to make a cup of tea, what specific 'selection' (if/then) instructions would you need to include?