

# Mastering Algorithms with Kit the Fox

*Learning objective: To understand, create, and debug simple algorithms using logical sequencing and precise instructions.*

Read each flashcard carefully. Try to explain the concept in your own words before checking the answer. Use these cards to test your knowledge of how computers process instructions.

**What is an algorithm?**

An algorithm is a precise, step-by-step set of instructions designed to complete a specific task or solve a problem.

**Why is the 'sequence' of steps important in an algorithm?**

Computers follow instructions in the exact order they are given. If the sequence is incorrect, the desired output will not be achieved.

**Kit the Fox is writing a program to make a robot move. What is 'debugging'?**

Debugging is the process of identifying, finding, and fixing errors or 'bugs' in an algorithm or computer program.

**Define 'decomposition' in the context of computing.**

Decomposition is the act of breaking down a large, complex problem into smaller, more manageable parts that are easier to solve.

**What is an 'input' in a computing system?**

An input is the data or information sent to a computer or system to be processed, such as pressing a key on a keyboard.

**What is an 'output' in a computing system?**

An output is the information or action produced by the computer after it has processed the input, such as words appearing on a screen.

**Explain why we use 'logical reasoning' when creating algorithms.**

Logical reasoning helps us predict the behaviour of our program and ensures that our instructions lead to the correct result every time.

**If a robot fails to follow a dance move, what is the first step you should take?**

You should review the sequence of the algorithm to find the exact step where the error occurred (the bug) and rewrite that instruction.

**Compare and contrast a recipe for baking a cake with a computer algorithm.**

Both are sets of step-by-step instructions. However, a recipe is followed by a human, while an algorithm is designed to be followed by a computer or machine.

**Justify why an algorithm must be precise.**

Computers lack human intuition, they cannot 'guess' what you mean. If instructions are vague, the computer cannot execute the task correctly.

**What might happen if you skip a step in an algorithm?**

The program might fail to run, or it might produce an incorrect result (an error), because the computer is missing essential information needed to complete the task.

**Explain why it is helpful to test an algorithm multiple times.**

Testing helps to uncover 'hidden bugs' or scenarios you might not have thought of, ensuring the algorithm is robust and works reliably in different situations.