

What should I already know?

- To use logical reasoning to explain how algorithms work and design algorithms that show a logical structure.
- To design and write programs that accomplish specific goals eg. Controlling or simulating physical systems
- To debug programs by decomposing them into smaller parts to identify errors.
- To use sequence, selection and repetition in programs by working with variables and a range of inputs/outputs.

Key learning

- Design algorithms that shows logical, achievable steps that shows new knowledge of coding structures eg. 'if' statements
- Design and write programs that show more complex coding structures such as selection and repetition.
- Debug programs by tracing code and using step-through methods to identify errors in code and correct them.
- Use variables such as timers and 'if' statements combined with variables already learnt. To use and manipulate the value of variables to achieve specific goals.

Key vocabulary

Algorithm – A set of instructions

Command – One instruction in an algorithm

Program – Something that provides the computer with instructions

Bug – A mistake or problem that stops something working the way that it should

Debug – To find and remove mistakes in algorithms or instructions

Coding – Writing instructions so that a computer can understand them and make a program

Code design – Designing what your program will look like and what it will do

Input – Information going into the computer eg. Clicking or moving the mouse or typing on the keyboard.

Output – Information that comes out of the computer eg sound

Sequence – The order of instructions from the top to the bottom. If you want to change the sequence, you would use the 'select' command.

Select – A type of command. When it is used, the program will choose a different outcome depending on a condition.

Repeat – A type of command. When it is used, a block of commands run a set number of times or forever.

Variables – A named area in a computer memory. A variable has a name and a value.

Timer – Use this command to run a block of commands after a timed delay or at regular intervals (eg every 2 minutes)

'If' statements – A conditional command that tests a statement. If it is true, then the commands inside the 'if' block will run.

Key questions

- Can you explain the stages of the design, code, test and debug process?
- What is an algorithm and how do they work?
- What happens if there is a bug?
- Why do we need to debug instructions?
- Why does tracing code help with debugging?
- Why do algorithms need a logical structure?
- Can you design and write programs for a specific goal?
- How are variables used in coding?
- Can you name variables that you use?
- Can you use and manipulate a range of variables?