Year 2
Programming

Prior Learning (Y1):

Introduces learners to early programming concepts. Learners will explore using individual command as part of a computer program. They will identify what each floor robot command does and use that knowledge to start predicting the outcome of programs. Learners are also introduced to the early stages of program design through the introduction of algorithms.

Current Learning (Y2):

Develops pupils' understanding of instructions in sequences and the use of logical reasoning to predict outcomes. Pupils will use given commands in different orders to investigate how the order affects the outcome. Pupils will also learn about design in programming. They will develop artwork and test it for use in a program. They will design algorithms and then test those algorithms as programs and debug them.

Future Learning (Y3):

Learners will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. The unit is paced to focus on all aspects of sequences, and make sure that knowledge is built in a structured manner. Learners also apply stages of program design through this unit.

Key Vocabulary

Vocabulary to use from Y1: Algorithm, program, command

Debug	The process of finding an issue in the program you have written and repairing it
Logical Reasoning	The process of applying rules to problem solving

Key Unit Specific Vocabulary:

Bee Bots; Mats; Routes; Obstacles; Design

Key Questions:

- How do I give clear instructions?
- What happens when we change the order of instructions?
- How can I use logical reasoning to predict the outcome of a program?
- How can I use my algorithm to create a program?
- How do I test and debug a program?

Giving Instructions:

Robots have a computer inside. Robots do what we want because they follow instructions. They don't make any choices themselves.

The instructions we give to robots and other computers are called '**algorithms**'.

The algorithm has to be:

- Clear
- In the right order to help give meaning

Making Predictions in Programming

Algorithms and programs are predictable, and programmers can make predictions based on following a program. They use a process called **logical reasoning**. This is where programmer's problem solve or predict what a program will do, based on what they have seen.

Debugging

Algorithms and programs may not be right first time, and if something isn't right with an algorithm or program, the problem (or 'bug') needs to be found and fixed. This is called 'debugging'.

Debugging is an essential part of the programming process. It is where programmers find problems in the program and fix it.

When programmers write long programs, they break their work into sections to make it easier to debug.

REMEMBER

Before inputting any new code…

- Check the starting position of the robot
- Clear the robot's memory before starting to program