Jeavons Wood Primary School

Knowledge Organiser for Year 2

Big question: How do you control a floor robot?

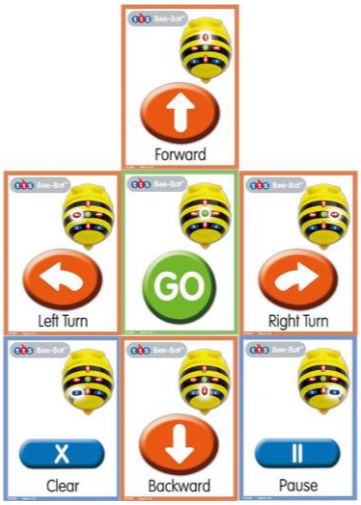
British Values Link: Tolerance

(Respecting differences, working together and learning about others, being kind to everyone)

National curriculum specification (KS1)
• Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions • Create and debug simple programs • Use logical reasoning to predict the behaviour of simple programs

In this unit, the children will:
Describe a series of instructions as a sequence
Explain what happens when we change the order of instructions
Use logical reasoning to predict the outcome of a program
Explain that programming projects can have code and artwork
Design an algorithm
Create and debug a program that they have written

Using a Floor Robot	Algorithms and Instructions
Robots are machines that we can program to do human jobs. They help us do things such as clean, mow and learn. In factories they can make things, and in hospitals they help make us better. Beebot's must be charged before we use them. You can tell it's on when the eyes light up. Remember to switch it off again after you've finished with it. The Beebots have buttons on the top that make the Beebot do something different. It's important to 'clear' the Beebot before programming your Beebot to ensure it's not remembered it's previous algorithm. 	Algorithms: precise sets of instructions, that a computer can turn into a code. A floor robot has a computer inside of it. Programs: When we press the button of our floor robot, we create a program for it to follow. The program is how the algorithm is run as code on the robot. Instructions: The instructions given to the floor robot must be clear. If our sequence of instructions is in the wrong order, has anything missing, or has anything additional, the floor robot will end up in a different place. Planning the route helps avoid obstacles and gets it to the right place.
Designing Algorithms	**Debugging**
This unit uses mats for the Beebots (created out of masking tape and printed pictures). The children design their algorithms so that the robot follows the	Finding and fixing errors in our algorithm. These errors can be: <u>Sequence errors</u>: An instruction in the sequence is wrong or in the wrong place.

given route. Children must carefully consider their start point and end point for the robot to reach. Symbols help indicate the commands that will be inputted as the program, and they recreate their commands on a whiteboard.  	Keyring errors: Typing in the wrong code. Logical errors: Mistakes in plan/thinking.

Key vocabulary:	
Programming	When we make a set of instructions for computers to follow
Robots	One type of machine that can follow programs. They follow what we instruct them to do.
Algorithm	A set of instructions to perform a task. We use them to help robots do the things we want them to.
Debugging	Finding and fixing errors in our algorithms.
Chunking	With larger programs, we can break the task into chunks and create algorithms for each chunk.

Teacher Subject Knowledge:	
Unit focus	This unit focuses on developing learners' understanding of computer programming. It highlights that algorithms are a set of clear, precise, and ordered instructions, and that a computer program is the implementation of an algorithm on a digital device. The unit also introduces reading 'code' to predict what a program will do. Learners will engage in aspects of program design, including outlining the project task and creating algorithms. When programming, there are four levels that can help describe a project, known as 'levels of abstraction'. Research suggests that this structure can support learners in understanding how to create a program and how it works: • Task — what is needed • Design — what it should do • Code — how it is done • Running the code — what it does

	Spending time at the 'task' and 'design' levels before engaging in writing code aids learners in assessing the achievability of their programs and reduces the cognitive load for learners during programming. Learners will move between the different levels throughout the unit.
Progression	In advance of the lessons in this Year 2 unit, learners should have had some experience of creating short programs using floor robots and predicting the outcome of a simple program. This unit progresses learners' knowledge and understanding of algorithms and how they are implemented as programs on digital devices. Learners will spend time looking at how the order of commands affects outcomes. Learners will use this knowledge and logical reasoning to trace programs and predict outcomes.