**Programming and Control**

**Whole School Overview**

|  |  |  |
| --- | --- | --- |
| Year Group | Learning Objectives | Key Skills |
| R | * To begin to understand that devices respond to commands and instructions. | * Explore a range of control toys and devices |
| 1 | * To understand that devices respond to commands * To begin to understand how a computer processes instructions and commands (computational thinking) * To understand that they can programme a simple sequence of commands into a programmable robot or toy to send it on a route | * Continue to explore a range of control toys and devices * Begin to develop computational thinking by following verbal instructions to move around a course and creating a series of instructions to move their peers around a course * Explore outcomes when individual buttons are pressed on robots, such as floor turtles and combine these together. |
| 2 | * To continue to develop their understanding of how a computer processes instructions and commands. * To understand that devices or on screen turtles are controlled by sequences of instructions or actions, and that these can be inputted using text. | * Further develop their understanding of computational thinking. * Continue to explore floor turtles, combining sequences of instructions to follow a pattern or create a shape. * Explore an on screen turtle navigate it around a course or grid and/or draw shapes by inputting a sequence of instructions. |
| 3 | * To continue to develop their understanding of how computer and technology works and how computers process instructions and commands. * To create, edit and refine basicsequences of instructions for a variety of programmable devices. * To use a computer to create basic applications, investigating how different variables can be changed and the effect this has. | * Continue to develop understanding of how a computer and technology works, focusing on computational thinking. * Begin to plan sequences of instructions for on-screen and floor turtles test and amend these instructions. * Use software to make basic puzzles and quizzes, changing parameters (e.g time allowed, points, number of pieces etc) to customise the puzzle or quiz (e.g. 2DIY) |
| 4 | * To continue to develop their understanding of how computer and technology works and how computers process instructions and commands. * To create, edit and refine more complex sequences of instructions for a variety of programmable devices. * To test instructions making changes and reviewing the outcome. | * Begin to plan more complex sequences of instructions for on-screen and floor turtles, test and amend these instructions. * Understand that software relies on codes to run and that a range of different coding languages exist. |
| 5 | * Use templates on a computer to create a game, which can be controlled by external inputs, changing parameters and algorithms and investigating the effect this has on the response. * To continue to develop their understanding of how computer and technology works and how computers process instructions and commands, including the use of coding languages. * To explore ways in which software can be planned. * To use assisted programing software to create basic software which interacts with external controllers, and elements on screen, creating algorithms and using logic and calculations. | * Continue to develop an understanding of how technology works, with a focus on developing computational thinking. * Explore different ways in which computer software can be planned. * Use a range of assited programing software (e.g Scratch and/or Kodu) to plan, design and create basic software (for example a simple game), which interact with external controllers (e.g. keyboard and/or mouse). Using the software control the movement and responses of different elements on screen. * Use visual programing based software to plan, design and create basic non-game software which use logic, algorithms and calculations. *(e.g. use scratch to create an interactive maths quiz for a KS1 child)* |
| 6 | * To continue to develop their understanding of how computer and technology works and how computers process instructions and commands, including the use of coding languages. * To use assisted programing software to create more complex software which interacts with external controllers, and elements on screen, creating algorithms and using logic and calculations | * Continue to explore different ways in which computer software can be planned. * Continue to develop an understanding of how technology works, with a focus on developing computational thinking * Use a range of visual based programing software (e.g Scratch and Kodu) to plan and design basic software (for example a simple game), controlling the movement and responses of different elements on screen. * Use a range of visual programing software to plan and design more complex software (for example a multi-level game) |