**Programming and Control**

**Whole School Overview**

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| 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
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| 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.
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| 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.
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| 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)
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| 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.
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| 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)*
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| 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)
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