# YEAR 3

| | EYFS | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 | YEAR 5 | YEAR 6 |
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| **Programming B – Events and actions** | **The three Prime ELGS of Communication and Language, PSED and Physical Development provide the foundations of which all other learning is built upon.**<br><br>**No Specific ELG links.** | To be introduced to on-screen programming. To explore sprites and backgrounds, using programming blocks to use, modify and create programs. To be introduced to program design through algorithms. | To understand that sequences of commands have an outcome. To use and modify designs to create and evaluate a project. | To explore the links between events and actions. To move sprites in four directions. To introduce programming extensions, changing the size and colour. To design and code their own program. | To explore the concept of repetition in programming. To look at similarities and differences between count controlled and infinite loops. To modify, design and create a game using repetition, applying stages of programming design throughout. | To develop knowledge of selection by revisiting how conditions can be used in programming. To create algorithms and programs using this understanding. To design, write and evaluate a quiz program. | To use the four programming constructs (sequence, repetition, selection and variables) whilst using a physical device. To design, build and test a simple program and transfer to device. |

## COMPOSITES

Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

Use sequence, selection, and repetition in programs; work with variables and various forms of input and output

To explain how a sprite moves in an existing project

Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

## COMPONENTS

| | 1 | 2 | 3 | 4 | 5 | | End Point |
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| | Can I explain how a sprite moves in an existing project? | How can I create a program to move a sprite in four directions? | Can I adapt a program to a new context? | How can I develop my program by adding features? | How can I identify and fix bugs in a program? | Can I design and create a maze-based challenge? | This unit assumes that children will have some prior experience of programming. The key stage 1 National Centre for Computing Education units focus on floor robots and ScratchJr, however experience of other languages or environments may also be useful. The Year 3 — Programming A unit introduces the Scratch programming environment and the concept of sequences. |

| **CONCEPTS**<br>**Link to concept map** | Programming B – Events and actions<br><br>Information Technology<br><br>Computer Science | Programming B – Events and actions<br><br>Information Technology<br><br>Computer Science | Programming B – Events and actions<br><br>Information Technology<br><br>Computer Science | Programming B – Events and actions<br><br>Information Technology<br><br>Computer Science | Programming B – Events and actions<br><br>Information Technology<br><br>Computer Science | Programming B – Events and actions<br><br>Information Technology<br><br>Computer Science | Programming B – Events and actions<br><br>Information Technology<br><br>Computer Science |
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| **SKILLS** | Choose which keys to use for actions and explain my choices<br><br>Identify a way to improve a program | Choose a character for my project<br><br>Choose a suitable size for a character in a maze<br><br>Program movement | Use a programming extension<br><br>Consider the real world when making design choices<br><br>Choose blocks to set up my program | Identify additional features (from a given set of blocks)<br><br>Choose suitable keys to turn on additional features<br><br>Build more sequences of commands to make my design work | Test a program against a given design<br><br>Match a piece of code to an outcome<br><br>Modify a program using a design | Make design choices and justify them<br><br>Implement my design<br><br>Evaluate my project | Children begin by moving a sprite in four directions (up, down, left, and right). They then explore movement within the context of a maze, using design to choose an appropriately sized sprite. Children are given the opportunity to draw lines with sprites and change the size and colour of lines. The unit concludes with children designing and coding their own maze-tracing program |
| **KNOWLEDGE** | Explain the relationship between an event and an action | I understand how to program a character. | I understand programming extension. | Understand computer programming. | Understand computer programming. | Understand computer programming | Children will learn that events cause actions, and that the order of those actions can have an impact on the outcome of a program. |
| **LESSON LINK** | Programming B – Events and actions | Programming B – Events and actions | Programming B – Events and actions | Programming B – Events and actions | Programming B – Events and actions | Programming B – Events and actions | Programming B – Events and actions |
| **PROGRESSIVE VOCABULARY** | motion, event, sprite, algorithm, logic | move, resize, algorithm | extension block, pen up, set up | pen, design, event, action, algorithm | debugging, errors, setup | design, code, setup, test, debug, actions, events | Children will be able to understand, articulate and use the vocabulary |
| **CURRICULUM EXPERIENCES** | | | | | | | Coding their own maze-tracing program |

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| **END POINT** | In this lesson, children will investigate how characters can be moved using 'events'. They will analyse and improve an existing project, and then apply what they have learned to their own projects. They will then extend their learning to control multiple sprites in the same project. | In this lesson, children will program a sprite to move in four directions: up, down, left, and right. They will begin by choosing a sprite and sizing it to fit in with a given background. Children will then create the code to move the sprite in one direction before duplicating and modifying it to move in all four directions. Finally, they will consider how their project could be extended to prove that their sprite has successfully navigated a maze. | This lesson will introduce children to extension blocks in Scratch using the **Pen** extension. Children will use the pen down block to draw lines, building on the movement they created for their sprite in Lesson 2. Children will then decide how to set up their project every time it is run. | In this lesson, children will be given the opportunity to use additional **Pen** blocks. They will predict the functions of new blocks and experiment with them, before designing features to add to their own projects. Finally, they will add these features to their projects and test their effectiveness. | This lesson explores the process of debugging, specifically looking at how to identify and fix errors in a program. Children will review an existing project against a given design and identify bugs within it. They will then correct the errors, gaining independence as they do so. Children will also develop their projects by considering which new setup blocks to use. | In this lesson, children will design and create their own projects. Using a template (which can be blank or partially completed), children will complete projects to move a sprite around a maze, with the option to leave a pen trail showing where the sprite has moved. Ideally, projects will include setup blocks to position the sprite at the start of the maze and clear any lines already on the screen. | |