



Portfields Primary School Medium Term Plan



Year Group – 3


Subject - **Computing**

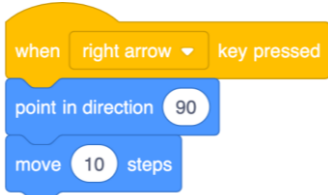
Strand – **Computer science** Topic – **Events & actions in programs**

Term - **Summer 1**


National Curriculum	Key Questions		Substantive Knowledge	Key Vocabulary	Real-Life Links
<ul style="list-style-type: none"> <li>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>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</li> </ul>	<p>Did your sprite move in all four directions?            Was your sprite the right size for this maze?            Did you avoid the lines?            Which keys move the sprite?            Can you avoid the black lines?            How is the sprite moved in this project?            Would this sprite work?            What could help you prove where your sprite has travelled?</p>		<ul style="list-style-type: none"> <li>Understand and explain how a sprite moves in an existing project.</li> <li>Understand how to create a program to move a sprite in four directions.</li> <li>Understand how to adapt a program to a new context.</li> <li>Understand how to develop their program by adding features.</li> <li>Understand how to design and create a maze-based challenge, identify, and fix bugs in their programme.</li> </ul>	<p>set up pen design action Logic Move Resize</p>	
	<p><b>Technical Questions</b></p>			<p><b>Technical Vocabulary</b></p>	<p><b>Devices used</b></p>
	<p>How do you control movement in computer games?</p> <ul style="list-style-type: none"> <li><i>By moving, shaking, or tilting a device</i></li> <li><i>Using a game controller on a device such as an Xbox or PlayStation</i></li> <li><i>Using a computer keyboard</i></li> <li><i>Using the movement of our bodies</i></li> </ul> <p>What controls can be used to move a sprite in Scratch?  <i>'Events' are used to sense 'inputs', which then trigger scripts to run. The mouse and the keyboard can be used to trigger <b>Events</b> blocks.</i></p> <p>How might you be able to change the way a line is drawn?</p> <ul style="list-style-type: none"> <li><i>erase all</i></li> <li><i>pen up</i></li> <li><i>pen down</i></li> <li><i>set pen color to</i></li> <li><i>change pen size by (1)</i></li> <li><i>change pen size by (-1)</i></li> </ul> <p>Why do we need to debug?  <i>To ensure that the algorithm we have created is working how we have programmed it to work.</i></p>	<p><b>Disciplinary Knowledge</b></p>	<p>Motion Event Sprite Algorithm extension block pen up actions debugging errors setup code test debug</p>	<p>Computer Laptops</p>	

**End of unit assessment questions**

<b>Lesson Breakdown</b>			
<b>Lesson 1</b>			
<b>Flashback Four</b>		<b>Learning Objectives</b>	<b>Star Knowledge</b>
<p><u>Last Lesson</u> Look at the question below: 'Does it have four legs?' What type of question is this? Why? <i>It is a closed question as it can only be answered with a yes or a no.</i></p>	<p><u>Last Topic</u> What is a closed question? <i>A closed question is a question that can only be answered with a yes or a no.</i></p>	<p>Learning objective: LO: To explain how a sprite moves in an existing project</p> <p>Success criteria:</p> <ul style="list-style-type: none"> <li>I can explain the relationship between an event and an action</li> <li>I can choose which keys to use for actions and explain my choices</li> <li>I can identify a way to improve a program</li> </ul> <p><u>Task 1:</u> Ask learners to complete the instructions (below) by experimenting with the project. Learners can jot down answers in their jotters. Which controls can you use to move Scratch the cat?</p> <ul style="list-style-type: none"> <li>Move right</li> <li>Move left</li> <li>Move up</li> <li>Move down</li> <li>Change costume</li> <li>Turn clockwise</li> <li>Turn anticlockwise</li> </ul> <p><u>Task 2:</u> Show learners the code snippets used in the Scratch project at <a href="https://ncce.io/pg3b-1-a2-ca">ncce.io/pg3b-1-a2-ca</a>. Ask them to think about how to improve the movement in the project they have been exploring. Give learners the opportunity to complete their projects.</p> <p><u>Task 3:</u> Challenge the learners to add a second sprite to their projects. The new sprite should have its movement controlled in a different way to their first sprite. Explain that if they used a key press to move their first sprite, they should use the mouse or trackpad for the second sprite. There are two blocks on the slide that could help learners to move their sprites in a different way.</p>	<p>Input devices allow us to give instructions to computers.</p>
<p><u>Last Year</u> Why is it important that we need to write letters in the right order when writing words? <i>Letters written in a different order would not have any meaning.</i></p>	<p><u>Previous Key stage</u> What are the similarities between bee-bots and ScratchJr?</p> <ul style="list-style-type: none"> <li>Both Bee-Bots and ScratchJr can be programmed</li> <li>You can give instructions to both Bee-Bots and ScratchJr</li> <li>Both Bee-Bots and ScratchJr will follow the instructions as they are told to.</li> </ul>		
<b>Lesson 2</b>			
<b>Flashback Four</b>		<b>Learning Objectives</b>	<b>Star Knowledge</b>
<p><u>Last Lesson</u> What do input devices do? <i>Input devices allow us to give instructions to computers.</i></p>	<p><u>Last Topic</u> What is an open question? <i>An open-ended question is a question that is answered in the person's own words and can be longer than yes or no.</i></p>	<p>Learning objective: LO: To create a program to move a sprite in four directions</p> <p>Success criteria:</p> <ul style="list-style-type: none"> <li>I can choose a character for my project</li> <li>I can choose a suitable size for a character in a maze</li> <li>I can program movement</li> </ul> <p><u>Task 1:</u> Direct learners towards the Scratch project at <a href="https://ncce.io/pg3b-2-a0-ca">ncce.io/pg3b-2-a0-ca</a>. Challenge the learners to move the sprite around the maze without crossing the black lines. The sprite can be moved using the arrow keys. In this project the sprite is able to cross the black lines, so explain to learners that this is not a complete game, and the emphasis is on moving the sprite.</p> <p><u>Task 2:</u> Direct learners towards the Scratch project at <a href="https://ncce.io/pg3b-2-a1-ca">ncce.io/pg3b-2-a1-ca</a>, which includes the maze background, but no sprite. Ask the learners to choose their own sprites. This can be a free choice, or you can direct learners towards a particular category or type of sprite. Watch the screen recording, or demonstrate in Scratch how to resize a sprite. When the learners have changed the value in the 'Size' field, they will need to press Enter to confirm the change. Learners may have to experiment with different values, depending on the original size of their sprite. If necessary, some learners may wish to change their sprite to an example that resizes more effectively for the maze in this project.</p> <p><u>Task 3:</u> Display the algorithm used to move a sprite to the right. Ask the learners to code this algorithm onto their sprite.</p>	<p>The pen down block will make the sprite draw a dot, then draw a trail of lines wherever it moves.</p> 
<p><u>Last Year</u> Why is it important to be very accurate with instructions? <i>If you are not accurate with instructions then the robot/person will complete the steps in the wrong order.</i></p>	<p><u>Previous Key stage</u> What is the name of the code blocks that control the sprite's movement? <i>Motion blocks.</i></p>		

		<p>It should look like this:</p>  <p>Explain to learners that to move a sprite in four directions, their sprite will need four code snippets, which will be similar to each other. Show that they can duplicate code by right-clicking on a two-button mouse or trackpad, or pressing Ctrl and click on a single button mouse or trackpad. Give learners the opportunity to duplicate and modify their code and test their projects. If necessary, learners should debug their projects.</p>	
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### Lesson 3

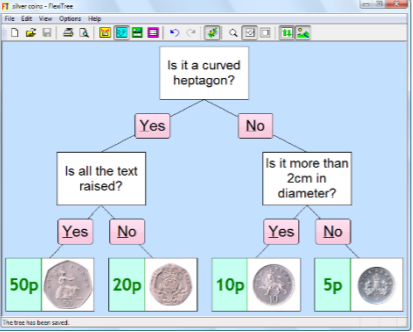
<u>Flashback Four</u>		<u>Learning Objectives</u>	<u>Star Knowledge</u>
<p><u>Last Lesson</u> What would happen if I use the pen down code block? <i>The pen down block will make the sprite draw a dot, then draw a trail of lines wherever it moves.</i></p>	<p><u>Last Topic</u> What is an advantage of creating and using a database? <i>Databases are specifically organised in a way that makes it easy to identify/find the information.</i></p>	<p>Learning objective: LO: To adapt a program to a new context</p> <p>Success criteria:</p> <ul style="list-style-type: none"> <li>I can use a programming extension</li> <li>I can consider the real world when making design choices</li> <li>I can choose blocks to set up my program</li> </ul> <p><u>Task 1:</u> Direct learners towards the Scratch project at <a href="https://nccce.io/pg3b-3-a0-ca">nccce.io/pg3b-3-a0-ca</a>. Give the learners the opportunity to try the project. Ask them to work in pairs to describe what is happening in this project, using the prompts on the slide. Learners should identify the following:</p> <ul style="list-style-type: none"> <li>The sprite moves in four directions, using the arrow keys</li> <li>When the sprite moves, a line is drawn on the screen</li> <li>Clicking the <b>Clear</b> sprite clears any lines that have been drawn</li> </ul> <p><u>Task 2:</u> This activity shows learners how to draw lines in Scratch. This requires the use of <b>Pen</b> blocks, which are <b>extension blocks</b>. Use the pen down block to draw a line when a sprite moves. Give learners time to create their own drawing projects.</p> <p><u>Task 3:</u> Give the learners the opportunity to recentre the sprites in their projects. Explain that by recentring their sprites, learners are making a design choice to make the pencil look more realistic.</p> <p><u>Task 4:</u> Ask learners to record the answers to the following questions in their jotters when watching the screen recording: What happens to the sprite? What colour is the pen set to? Does anything else happen? Give the learners the opportunity to add setup to the projects they have started in this lesson, using the blocks displayed on the slide. Ask the learners to save their work.</p>	<p>If a sprite is currently using the pen because of the Pen Down block, the pen up block will cause the sprite to stop drawing a trail.</p> 
<p><u>Last Year</u> What is it called when you test your plan to see if there are any mistakes? <i>Testing to see if there are any mistakes in your plan is called debugging.</i></p>	<p><u>Previous Key stage</u> What is the name of the code blocks that determine how and when the program starts and stops? <i>Event blocks.</i></p>		

### Lesson 4

<u>Flashback Four</u>		<u>Learning Objectives</u>	<u>Star Knowledge</u>
<p><u>Last Lesson</u> What would happen if I use the pen up code block? <i>If a sprite is currently using the pen because of the Pen Down block, the pen up block will cause the sprite to stop drawing a trail.</i></p>	<p><u>Last Topic</u> What are you doing if you are debugging a code? <i>You are testing to see if a programme or code works, and then fixing it if it doesn't.</i></p>	<p>Learning objective: LO: To develop my program by adding features</p> <p>Success criteria:</p> <ul style="list-style-type: none"> <li>I can identify additional features (from a given set of blocks)</li> </ul>	<p>Tools such as the pen up and pen down block are functions. Functions are parts of a code that have a specific task.</p>

<p><u>Last Year</u> What happens when you undo something on a computer? <i>The 'Undo' button can remove some of the changes that have been made to the page.</i></p>	<p><u>Previous Key stage</u> What is the name of the code blocks that control how a sprite looks? <i>Look blocks.</i></p>	<ul style="list-style-type: none"> <li>I can choose suitable keys to turn on additional features</li> <li>I can build more sequences of commands to make my design work</li> </ul> <p><u>Task 1:</u> Direct learners towards the Experimenting with <b>Pen</b> blocks Scratch projects: <a href="https://nccce.io/pg3b-4-a1-ca">nccce.io/pg3b-4-a1-ca</a>. Give the learners the opportunity to experiment with these blocks by adding <b>Events</b> blocks to the <b>Pen</b> blocks. Learners should be able to change, start, and stop drawing lines using pen down and pen up, draw a line in a different colour using set pen colour to, and change the thickness of the line using change pen size. They will also be able to clear all lines drawn on the screen using erase all.</p> <p><u>Task 2:</u> For this activity, ensure that the learners still have access to their projects from the 'Experimenting with <b>Pen</b> blocks' activity. Draw the learners' attention to the broken line. Give them the opportunity to recreate this line in their projects. Draw the learners' attention to the line that changes from blue to red. Give them the opportunity to recreate this line in their projects.</p>	
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**Lesson 5**

<b>Flashback Four</b>		<b>Learning Objectives</b>	<b>Star Knowledge</b>
<p><u>Last Lesson</u> What is an example of a function in coding? <i>Some examples are:</i></p> <ul style="list-style-type: none"> <li>Pen up</li> <li>Pen down</li> <li>Set pen to colour...</li> <li>Change pen size</li> <li>Erase all</li> </ul>	<p><u>Last Topic</u> What is the name of this type of database?</p>  <p><i>This is a branching database.</i></p>	<p>Learning objective: LO: To design and create a maze-based challenge</p> <p>Success criteria:</p> <ul style="list-style-type: none"> <li>I can make design choices and justify them</li> <li>I can implement my design</li> <li>I can evaluate my project</li> </ul> <p><u>Task 1:</u> Distribute the 'Design a maze project' worksheets and show the learners the design template. You can provide a blank template or a part-completed sheet. A complete example is also provided. Give the learners time to complete their designs.</p>	<p>It is important to plan before coding to allow you to see any possible problems (bugs) that your code might have and for you to be able to fix them (debug).</p>
<p><u>Last Year</u> What is a sequence? <i>A sequence is the particular order in which things are followed.</i></p>	<p><u>Previous Key stage</u> In computing and coding, what is a variable? <i>Something that will change/vary. For example: when we need to measure or count something that changes, like a score, or a name, or the answer to a question, or a number.</i></p>	<p><u>Task 2:</u> Provide learners with a link to the template Scratch project: <a href="https://nccce.io/pg3b-6-a2-ca">nccce.io/pg3b-6-a2-ca</a></p> <p>Go through the five steps learners will need to follow to implement their designs, and leave these on the screen as they work on their own projects.</p> <ol style="list-style-type: none"> <li>Add, resize, and recentre your sprite</li> <li>Choose <b>Events</b> blocks</li> <li>Add <b>Motion</b> blocks</li> <li>Add <b>Pen</b> blocks</li> <li>Set up your project (so it starts in the same way each time)</li> </ol> <p>Encourage the learners to follow their designs and to test their projects each time they add new code.</p> <p><u>Task 3:</u> Once learners have completed their projects, they should test them. Emphasise that their projects should reflect their designs. They should also test to make sure that everything in their project works, eg is the right event linked to the right action?</p>	