

Tutorial Name	National Curriculum objectives	Coding concepts/criteria for assessment	Questions	Cross-curricula ideas	Starter projects
<b>Year 2</b>					
<b>Getting started</b>	<ul style="list-style-type: none"> <li>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>create and debug simple programs</li> <li>use logical reasoning to predict the behaviour of simple programs</li> </ul>	<ul style="list-style-type: none"> <li>Blocks each have a specific function/command</li> <li>Blocks act in the order they are arranged</li> <li>An algorithm needs a starting trigger (input) at the beginning</li> <li>Actions onscreen are controlled by commands</li> <li>Actions need to be timed</li> </ul>	<p>How else could I start the program?            How 'far' is the width of the screen?            Can you change what he says?</p>	<p>With these three modules completed you can take any character and get them to 'say' words via a speech bubble.</p> <p>Teachers will immediately see the possibilities for linking literacy and the wider curriculum context to these skills.</p>	<p>5 Random facts about me</p> <p>Dance Party</p>
<b>Add a sprite</b>	<ul style="list-style-type: none"> <li>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>create and debug simple programs</li> <li>use logical reasoning to predict the behaviour of simple programs</li> </ul>	<ul style="list-style-type: none"> <li>Additional content, such as a sprite, can be added to a program</li> </ul>	<p>How do I find a new sprite?            How can I take a background away from my uploaded sprite?            How can I change my sprite size?            How can I put my sprite in a different starting place?            Can I use two sprites?</p>	<p>Examples:</p> <ul style="list-style-type: none"> <li>Character from a story explains something in the plot/how they feel</li> <li>Character from history recalls a fact</li> <li>Parts of a plant are described</li> </ul>	

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<b>Add a backdrop</b>	<ul style="list-style-type: none"> <li>• understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>• create and debug simple programs</li> <li>• use logical reasoning to predict the behaviour of simple programs</li> </ul>	<ul style="list-style-type: none"> <li>• A program can be run with different backgrounds</li> <li>• A program can be tested by running it</li> </ul>	<p>How can I add a new backdrop?</p> <p>How can I add text to the backdrop?</p> <p>How can I change the appearance of the backdrop?</p>		
All of the above can be applied to a range of activities to support a range of curriculum situations. The tutorials below take the basics from above and extend the possibilities					
<b>Year 3</b>					
<b>Record a sound</b>	<ul style="list-style-type: none"> <li>• understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>• create and debug simple programs</li> <li>• use logical reasoning to predict the behaviour of simple programs</li> </ul>	<ul style="list-style-type: none"> <li>• Programs can be used to play sounds</li> <li>• Sounds can be inputted into some programs</li> </ul>	How can I make my character say...?	These two tutorials and activities open up a wider range of possibilities for the children to include multiple sprites, events organised along a timeline and simple repeat. The progression from above therefore allows children to create more complex	<p>Animate the Crab</p> <p>The Pico Show: Intro</p> <p>Wizard Spells</p> <p>Remix this Dance (good for practical learning of x and y)</p> <p>Virtual Tour</p>

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<b>Animate a name</b>	<ul style="list-style-type: none"> <li>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>create and debug simple programs</li> <li>use logical reasoning to predict the behaviour of simple programs</li> </ul>	<ul style="list-style-type: none"> <li>Sprites can be changed in their appearance (e.g., size, rotation, colour)</li> <li>A simple sequence can be repeated using a repeat function block</li> <li>Negative numbers in code do the opposite of positive numbers</li> </ul>	<p>Can I make my letters all grow at the same time?  Can I make my letters grow one at a time?  Can I make each letter make a sound, one after the other?</p>	<p>animations to illustrate learning in other curriculum areas.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>Characters from a story playing out a scene</li> <li>Create an animation to highlight a key word in science "Photosynthesis!"</li> </ul>	<p>Remix this Dance</p> <p>DJ Scratch Cat</p> <p>Paint with Gobo</p>
<b>Animate a sprite</b>	<ul style="list-style-type: none"> <li>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>create and debug simple programs</li> <li>use logical reasoning to predict the behaviour of simple programs</li> </ul>	<ul style="list-style-type: none"> <li>Changing between different poses of a sprite can create animation</li> <li>Algorithms can include time commands to make them run effectively</li> </ul>	<p>How can I show my character is animated?  Can I control the speed and duration of the animation to fit a story?</p>	<ul style="list-style-type: none"> <li>A figure from history explains facts about a scene</li> </ul>	

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<b>Add effects</b>	<ul style="list-style-type: none"> <li>• understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>• create and debug simple programs</li> <li>• use logical reasoning to predict the behaviour of simple programs</li> </ul>	<ul style="list-style-type: none"> <li>• Variables affect how a sprite appears</li> </ul>	Can I control my effects to fit the story timeline?		
By this stage of experience children will be experimenting with a range of blocks that each sprite can ‘perform’. Introducing ‘repeat’ and multiple programmes on the same canvas begins to develop an understanding of multiple things happening within a program beyond a simple timeline.					
<b>Year 4</b>					
<b>Animate a character</b>	<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> </ul>	<ul style="list-style-type: none"> <li>• Different inputs can have different outcomes</li> <li>• Multiple inputs can be used within a program</li> <li>• x and y are used to locate sprites on a screen</li> <li>• Effects can be reset by subsequent commands</li> </ul>	What can I do to change my sprite? How can I make my sprite speak?	<p>Having the ability to use multiple backdrops allows the complexity of animations to be extended so a story can now move from scene to scene, a retelling of facts can focus on different places or more items than previously.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• Simple ‘cartoon’ of a story with a scene per paragraph</li> <li>• ‘Five key facts</li> </ul>	<p>Teens in the Castle</p> <p>Introducing Howler</p> <p>What Should I Wear</p> <p>Soundflower</p> <p>Piano</p> <p>Greeting Card</p>

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<b>Create a story</b>	<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> </ul>	<ul style="list-style-type: none"> <li>• A program can control multiple sprites</li> <li>• Timings need to be written into a program for it to run effectively</li> <li>• Multiple time lines can be run concurrently for different sprites</li> <li>• Sprites can 'act' within different scenes (backdrops)</li> </ul>	Can I adapt my code to include different sprites, backdrops and speech to show a different story?	about....' Introduced by a character or even an animated version of themselves	
<p>The two tutorials above offer a range of possibilities across the curriculum but also the opportunity to plan longer pieces of programming across several scenes. Input can be once at the start and the whole thing unfolds or multiple inputs for different events/actions. Once completed the children should be able to use Scratch to create any response to a narrative type structure as a stimulus whether fictional or fact. The 'Glide Around' tutorial can also help add some background animation to the story scenes.</p>					
<b>Year 5</b>					

Tutorial Name	National Curriculum objectives	Coding concepts/criteria for assessment	Questions	Cross-curricula ideas	Starter projects
<b>Use arrow keys</b>	<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> </ul>	<ul style="list-style-type: none"> <li>Multi directional controls can be programmed for a sprite</li> </ul>	How can I make my movement smoother?	Either using characters from history or a story, making a game of the 'film' is a great way to connect the way that the two media forms are getting ever closer in the real world. Additionally you can use a Clicker type format to have multiple objects that score you a point and some that lose you a point.	Maze Starter  Hide and Seek  Bubble with Video Sensing  Musical Buttons  Spiral Maker
<b>Make a clicker game</b>	<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> </ul>	<ul style="list-style-type: none"> <li>Algorithms need a reset function programmed in if it is designed to start from the same place each 'play'</li> <li>Variables can be created to control information</li> </ul>	How can I end the game? Can I add sprites that reduce my score if clicked?	Examples: <ul style="list-style-type: none"> <li>After writing an adventure story can the children turn it into a game for each scene</li> <li>Create a clicker game for children in Y1/ Reception where they have to click on the correct picture when the first letter appears</li> </ul>	

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<b>Make a chase game</b>	<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> </ul>	<ul style="list-style-type: none"> <li>• Conditional commands can result in different outcomes depending on multiple factors e.g., if, then</li> </ul>	How can I make the game harder? Faster? Easier?		
<p>The games above build on simple programming and add the use of a conditional and a variable. The games themselves could be adapted for a range of purposes once mastered to link with other curriculum themes. The examples below further extend the range of control the children have to create their own games and stories using a range of inputs and levels/stages.</p>					
<b>Year 6</b>					

Tutorial Name	National Curriculum objectives	Coding concepts/criteria for assessment	Questions	Cross-curricula ideas	Starter projects
<b>Animate an adventure game</b>	<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> </ul>	<ul style="list-style-type: none"> <li>Use variables to trigger actions (such as moving from one level to the next when a score is reached)</li> </ul>	Can you make the game harder? Easier?	<p>Using a context from another subject allows children to put their learning into either an animated story or a game format.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>Escape from Rome! The children create a series of levels where players have to pick up the correct Roman object to progress</li> <li>Children create a choose your own adventure with a choice at the end of each 'scene' top move to a different outcome</li> </ul>	<p>Pong starter</p> <p>Save the Mini-Figs</p> <p>Pizza Chef</p>
<b>Code a cartoon</b>	<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> </ul>	<ul style="list-style-type: none"> <li>Multiple sprites have multiple 'timelines' and actions</li> <li>Sprites can trigger change of scene</li> </ul>	Can you add variables so that the story is audience led?		

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<b>Pong Game</b>	<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> </ul>	<ul style="list-style-type: none"> <li>• Program for a mouse or a finger (on a tablet) to control a sprite</li> <li>• Program an end condition to a game</li> </ul>	Can you add multiple elements, some that have to be missed and some that you have to stop?		

Broadcast and receive  
Video sensing