



Village Primary School- Computer Curriculum
Programming

EYFS		
Learning		
<p>In Nursery... Children will be exposed to a range of real life and role play objects that allow them to explore and pretend. They will use things with buttons, flaps and that have a cause and effect such as sound when a button is pressed.</p>	<p>In Reception... The children will use a range of technology within the classroom and follow instructions in the classroom and lesson contexts i.e., getting ready for home or baking. There are hands on physical devices such as code-a-pillars, code-a-critter and Beebots as well as apps like Coding Safari where children can start to understand that they can control the movement of objects by giving instructions (algorithms).</p>	<p>In Year 1... Building on from all the exploration EYFS has offered the learners in Year 1 will continue to look at programming without using any physical devices (unplugged). There will be opportunities for following algorithms and creating their own in the context of other subjects i.e. DT making a sandwich, PE coding a dance routine. In the second part of the year this learning will be built on using Beebots and using the same blocks and instructions that they used physically in Spring 1. They will get opportunity to plan out routes and then programme the Beebot to follow this through.</p>
Key vocabulary-		
Press, button, flap, sound, move, pulley, knob, touchscreen, instructions, arrows, Beebot, Code-a-pillar, Code-a-critter, robot.		
Progression/End Points		
<p>Nursery:</p> <ul style="list-style-type: none"> • Knows how to operate simple equipment, e.g. Talks to Alexa, uses a remote control, can navigate touch-capable technology with support. • Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images. • Shows an interest in technological toys with knobs or pulleys, real objects such as cameras, and touchscreen devices such as mobile phones and tablets. <p>Reception:</p> <ul style="list-style-type: none"> • Uses ICT hardware to interact with age- appropriate computer software. 		

Year 1		
Learning		
Prior knowledge	In Year 1...	In Year 2...

<p>The children will use a range of technology within the classroom and follow instructions in the classroom and lesson contexts i.e., getting ready for home or baking. There are hands on physical devices such as code-a-pillars, code-a-critter and Beebots as well as apps like Coding Safari where children can start to understand that they can control the movement of objects by giving instructions (algorithms).</p>	<p>Building on from all the exploration EYFS has offered the learners in Year 1 will continue to look at programming without using any physical devices (unplugged). There will be opportunities for following algorithms and creating their own in the context of other subjects i.e. DT making a sandwich, PE coding a dance routine. In the second part of the year this learning will be built on using Beebots and using the same blocks and instructions that they used physically in Spring 1. They will get opportunity to plan out routes and then programme the Beebot to follow this through.</p>	<p>Year 2 will move the learning that has happened previously from unplugged and hands-on physical devices to on the screen programming using Scratch. They will apply the previous vocabulary and experiences to then be able to programme the sprites on the screen to move. They will start to think about how 'bugs' in the instructions stop the algorithm running correctly and that they can debug it by working through the instructions. They will also be taught and learn how to use the loop block so that a set of instructions becomes easier to follow.</p>
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Key vocabulary-

Arrow, directions, forward, backward, left, right, turn, instructions, sequence, algorithm, decompose, order, blocks.

Progression/ End Points

	<p>Spring Term 1</p> <ul style="list-style-type: none"> • I can create a sequence of instructions for someone to follow (algorithm). • I understand that the order of instructions is important. • I can break a sequence of moves down into its parts. • I can decompose a sequence. 	<p>Summer Term 2</p> <ul style="list-style-type: none"> • I can predict the outcome of a command on a device. • I can match a command to an outcome. • I can run a command on a device. • I can predict the outcome of a sequence. • I can explain what my program should do.
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Year 2

Learning

<p>Prior knowledge Building on from all the exploration EYFS has offered the learners in Year 1 will continue to look at programming without using any physical devices</p>	<p>In Year 2... Year 2 will move the learning that has happened previously from unplugged and hands-on physical devices to on the screen programming using Scratch.</p>	<p>In Year 3... In year 3 learners will start to use a range of blocks in Scratch that build on</p>
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<p>(unplugged). There will be opportunities for following algorithms and creating their own in the context of other subjects i.e. DT making a sandwich, PE coding a dance routine. In the second part of the year this learning will be built on using Beebots and using the same blocks and instructions that they used physically in Spring 1. They will get opportunity to plan out routes and then programme the Beebot to follow this through.</p>	<p>They will apply the previous vocabulary and experiences to then be able to programme the sprites on the screen to move. They will start to think about how 'bugs' in the instructions stop the algorithm running correctly and that they can debug it by working through the instructions. They will also be taught and learn how to use the loop block so that a set of instructions becomes easier to follow.</p>	<p>the initial work in year 2. They will follow tutorials to help them achieve the objectives as well as create their own games that include changing sprites and backgrounds (stage). In the Summer term children will apply the skills they have learnt in Scratch to Kodo which uses similar coding practices so will allow teachers to see if the principles of algorithms, programming and coding are embedded.</p>
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Key vocabulary-
sequence, sprite, algorithm, predict, execute, debug, error, loop/repetition, blocks

Progression/ End Points.

	<p>Spring Term 1</p> <ul style="list-style-type: none"> Place instructions into the correct order (sequence) to make something work. Use direction arrows to move an on-screen object (character/sprite) to achieve an objective. Predict a route and sequence direction commands (algorithm) to achieve an objective. Correct the errors if necessary (debug). Sequence code blocks, including movements and execute (start program) blocks to write a program to achieve an objective. 	<p>Summer Term 2</p> <ul style="list-style-type: none"> Create and debug simple programs by selecting code blocks, placing them in the correct sequence and executing a program. Use logical reasoning to predict the behaviour of simple programs. Simplify a program by using a loop.
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Year 3

Learning

<p>Prior knowledge Year 2 will move the learning that has happened previously from unplugged and hands-on physical devices to on the screen programming using Scratch. They will apply</p>	<p>In Year 3... In year 3 learners will start to use a range of blocks in Scratch that build on the initial work in year 2.</p>	<p>In Year 4... Year 4 will start to use more blocks and understand how the sprites and stage can interact by using sensing. Sensing will require children to recap input and output work (Year 3</p>
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<p>the previous vocabulary and experiences to then be able to programme the sprites on the screen to move. They will start to think about how 'bugs' in the instructions stop the algorithm running correctly and that they can debug it by working through the instructions. They will also be taught and learn how to use the loop block so that a set of instructions becomes easier to follow.</p>	<p>They will follow tutorials to help them achieve the objectives as well as create their own games that include changing sprites and backgrounds (stage). In the Summer term children will apply the skills they have learnt in Scratch to Kodo which uses similar coding practices so will allow teachers to see if the principles of algorithms, programming and coding are embedded.</p>	<p>Networking) and to explore how we can use the keyboard, camera, mouse to make sounds, movement etc within scratch. As always there is opportunity for unplugged activities to consolidate understanding especially of vocabulary and application of skills. In the Summer term children will take all their knowledge of coding done so far and apply it to the micro: bits. This gives the children further understanding of inputs and outputs and how coding on the screen can control an external output i.e. the micro: bit. Opportunity will be given for cross curricular application where the micro:bit might be used for DT, maths, science learning etc.</p>
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Key vocabulary-
 Sprite, stage (background/scene), sequence, debug, loop, repetition, inputs
 Kodo, blocks, conditions, variables

Progression/ End Points

	<p>Spring Term 1</p> <ul style="list-style-type: none"> • Know that code blocks in Scratch are different colours to help you find the blocks you need. • Know that code blocks can be used to draw shapes by programming a pen trail and movements. • Know that a repetition can be used to a make a program simpler. • Know how to program an input, such as keyboard arrow keys to make a sprite move. • Know how to find errors in a program and correct them. 	<p>Summer Term 2</p> <ul style="list-style-type: none"> • Create a 3D place using various design tools • Write a program to control a character using inputs • Write a program with conditions to create an if statement (If the character touches an object it will disappear) • Add a multi-player aspect • Write a program with variables (scoring system) • Program operators (equals) to achieve a score and win game.
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Year 4

Learning

<p>Prior knowledge</p> <p>In year 3 learners will start to use a range of blocks in Scratch that build on the initial work in year 2. They will follow tutorials to help them achieve the objectives as well as create their own games that include changing sprites and backgrounds (stage). In the Summer term children will apply the skills they have learnt in Scratch to Kodo which uses similar coding practices so will allow teachers to see if the principles of algorithms, programming and coding are embedded.</p>	<p>In Year 4...</p> <p>Year 4 will start to use more blocks and understand how the sprites and stage can interact by using sensing. Sensing will require children to recap input and output work (Year 3 Networking) and to explore how we can use the keyboard, camera, mouse to make sounds, movement etc within scratch. As always there is opportunity for unplugged activities to consolidate understanding especially of vocabulary and application of skills.</p> <p>In the Summer term children will take all their knowledge of coding done so far and apply it to the micro: bits. This gives the children further understanding of inputs and outputs and how coding on the screen can control an external output i.e. the micro: bit. Opportunity will be given for cross curricular application where the micro:bit might be used for DT, maths, science learning etc.</p>	<p>In Year 5...</p> <p>In Year 5 the learners will continue their Scratch learning by exploring ever more increasingly complex concepts and blocks. They will use lists inputs to generate random outputs. Children should have the opportunity to look at games made that include these blocks and concepts and then 'remix' the games with their own ideas. This also will allow children to debug codes and show a deeper understanding.</p> <p>As always there is opportunity for unplugged activities to consolidate understanding especially of vocabulary and application of skills.</p> <p>In the Summer term learners will look at the concept of text-based programming. Although this may look different to the programming, they have previously done links should be made to the similarities, vocabulary and skills they are already familiar with i.e. inputs, outputs, sequence, debugging etc.</p>
<p>Key vocabulary-</p> <p>Scratch: inputs, outputs, selection, sensing, variables, debug</p> <p>Micro:bits: outputs, inputs, accelerometer, processor</p>		
<p>Progression/ End Points</p>		
	<p>Spring Term 1</p> <ol style="list-style-type: none"> 1. Program inputs with loops, selection and sensing for interactions. 2. Work with variables and various forms of input and output. 3. Debug programs that accomplish goals. (correcting errors) 	<p>Summer Term 2</p> <ol style="list-style-type: none"> 1. Understand that computers use physical inputs and outputs and give examples. 2. Program physical inputs, outputs (e.g program LED lights), loops and random variables (Microbit activities). 3. Design, write and debug programs that

	<p>4. Use selection, data variables and operators.</p> <p>5. Program a virtual robot using Scratch blocks.</p>	<p>accomplish specific goals, including controlling or simulating physical systems.</p>
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Year 5

Learning

<p>Prior knowledge</p> <p>Year 4 will start to use more blocks and understand how the sprites and stage can interact by using sensing. Sensing will require children to recap input and output work (Year 3 Networking) and to explore how we can use the keyboard, camera, mouse to make sounds, movement etc within scratch.</p> <p>As always there is opportunity for unplugged activities to consolidate understanding especially of vocabulary and application of skills.</p> <p>In the Summer term children will take all their knowledge of coding done so far and apply it to the micro: bits. This gives the children further understanding of inputs and outputs and how coding on the screen can control an external output i.e. the micro: bit. Opportunity will be given for cross curricular application where the micro:bit might be used for DT, maths, science learning etc.</p>	<p>In Year 5...</p> <p>In Year 5 the learners will continue their Scratch learning by exploring ever more increasingly complex concepts and blocks. They will use lists inputs to generate random outputs. Children should have the opportunity to look at games made that include these blocks and concepts and then 'remix' the games with their own ideas. This also will allow children to debug codes and show a deeper understanding.</p> <p>As always there is opportunity for unplugged activities to consolidate understanding especially of vocabulary and application of skills.</p> <p>In the Summer term learners will look at the concept of text-based programming. Although this may look different to the programming, they have previously done links should be made to the similarities, vocabulary and skills they are already familiar with i.e. inputs, outputs, sequence, debugging etc.</p>	<p>In Year 6...</p> <p>By Year 6 children should be familiar with most major blocks and most learners should be able to work independently. They should be allowed to explore the objectives to make projects that are individual to them if they meet the objectives i.e. broadcasting although the tutorials in scratch can be used to scaffold less confident learners. Learners may spend a sustained amount of time on one project; going back to amend, adapt etc. Children should be encouraged to investigate each other's projects and may wish to remix (good opportunity to talk about creative license and giving credit to projects remixed)</p> <p>As always there is opportunity for unplugged activities to consolidate understanding especially of vocabulary and application of skills. Building on from the Year 5 text-based programming Year 6 children will explore Python. Children should understand the similarities and differences between Scratch and python and the real-life application of it. They can then use activities and games to start to create commands using python script.</p>
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Key vocabulary-
Scratch: inputs, selection, sensing, variables, list variable, random, debug, remix

Text based programming: Javascript, Logo, function, loops/repetition, variables

Progression/ End Points		
	<p>Spring Term 1</p> <ol style="list-style-type: none"> 1. Program inputs for control, selection (conditions) and sensing for interaction and data variables for scoring and a game timer. 2. Program distance sensing and movement. 3. Program Inputs, outputs, loops, selection, sensing and variables. 4. Program list variables that chooses randomly. 	<p>Summer Term 2</p> <p>Change the variables of text-based commands.</p> <ol style="list-style-type: none"> 2. Write text-based commands accurately and use fill effects, stamps and functions. 3. Write text-based commands to program digital art. 4. Write text commands/functions to program keyboard inputs in a game. 5. Programming a Logo turtle to move and use pen. 6. <i>Use co-ordinates in with a Logo turtle.</i> 7. <i>Print labels in Logo.</i> 8. <i>Program a loop (repetition) and shapes in Logo Turtle.</i> 9. <i>Program colours in Logo turtle.</i> 10. <i>Program variables in Logo turtle.</i>
Year 6		
Learning		
<p>Prior knowledge</p> <p>In Year 5 the learners will continue their Scratch learning by exploring ever more increasingly complex concepts and blocks. They will use lists inputs to generate random outputs. Children should have the opportunity to look at games made that include these blocks and concepts and then ‘remix’ the games with their own ideas. This also will allow children to debug codes and show a deeper understanding.</p> <p>As always there is opportunity for unplugged activities to consolidate understanding especially of vocabulary and application of skills.</p> <p>In the Summer term learners will look at the concept of text-based programming. Although this may look different to the programming, they have previously done links should be made to the similarities, vocabulary and skills they are already familiar with i.e. inputs, outputs, sequence, debugging etc.</p>	<p>In Year 6...</p> <p>By Year 6 children should be familiar with most major blocks and most learners should be able to work independently. They should be allowed to explore the objectives to make projects that are individual to them if they meet the objectives i.e. broadcasting although the tutorials in scratch can be used to scaffold less confident learners. Learners may spend a sustained amount of time on one project; going back to amend, adapt etc. Children should be encouraged to investigate each other's projects and may wish to remix (good opportunity to talk about creative license and giving credit to projects remixed)</p> <p>As always there is opportunity for unplugged activities to consolidate understanding especially of vocabulary and application of skills. Building on from the Year 5 text-based programming Year 6</p>	

	<p>children will explore Python. Children should understand the similarities and differences between Scratch and python and the real-life application of it. They can then use activities and games to start to create commands using python script.</p>	
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Key vocabulary-

Scratch: inputs, operators, sensing, variables, broadcasts.

Python: syntax, print, range

Progression/ End Points

	<p>Spring Term 1</p> <ol style="list-style-type: none"> 1. Program inputs, selection, loops and random variables (operators) for unpredictability. 2. Program inputs, selection (conditions), sensing, random variables, operators for direction and data variables for scoring. 3. Use inputs, selection (conditions), loops, sensing, costume changes and broadcasts. 	<p>Summer Term 2</p> <ol style="list-style-type: none"> 1. Write basic python syntax. 2. Print text. 3. Use Python as a calculator. 4. Program loops to repeat text. 5. Program interactive inputs. 6. Find errors in a program. 7. Program a trivia chatbot using 'send message' functions.
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	4. Work with multiple sprites to send broadcast messages between them.	
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