



Computing – Progression of Skills and Knowledge

NCCE Computing Curriculum

Early Years

Computing within the Early Years Foundation Stage

There is no one direct area of learning from the EYFS that links to computing but the most relevant learning falls under the following areas of learning: personal, social and emotional development, physical development, understanding the world and expressive art and design.

Early substantive and implicit skills will be planned and delivered through a tailored, 'in the moment' approach to engage all children of differing needs, prior experience and interest and will be evident through a range of child led and adult focused activities.

Three and Four Year Olds typically (some children may have gaps in these areas):

Personal, Social and Emotional Development	<ul style="list-style-type: none"> Remember rules without needing an adult to remind them.
Physical Development	<ul style="list-style-type: none"> Match their developing physical skills to tasks and activities in the setting.
Understanding the World	<ul style="list-style-type: none"> Explore how things work.

Reception children typically:

Personal, Social and Emotional Development	<ul style="list-style-type: none"> Show resilience and perseverance in the face of a challenge. Know and talk about the different factors that support their overall health and wellbeing – 'sensible' amounts of screen time.
Physical Development	<ul style="list-style-type: none"> Develop their small motor skills so that they can use a range of tools competently, safely and confidently.
Expressive Arts and Design	<ul style="list-style-type: none"> Explore, use and refine a variety of artistic effects to express their ideas and feelings.

The relevant Early Learning Goals are (expectations for the end of Year R):

Personal, Social and Emotional Development: Managing Self

- Be confident to try new activities and show independence, resilience and perseverance in the face of a challenge.
- Explain the reasons for rules, knowing right from wrong and try to behave accordingly.

Expressive Arts and Design: Creating with Materials

- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

How does Art link to our EY Curricular Aspirations?

Children use technology as a part of their research and learning to achieve all four curricular aspirations. For example:

- Watch videos of chefs producing food to support with their understanding of how to follow a recipe.
- Reading and engaging with online stories to prepare them to compose and publish their own piece of fiction.
- Using resources such as Google Maps to develop their understanding of mapping to help them to guide an adult through a forest school session.
- Using online resources, images and videos to explore the wider world.

Years One and Two – Cycle A

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Focus for this Unit	Computing Systems Technology Around Us	Creating Media Digital Painting	Programming Moving a Robot	Computing Systems Information Technology Around Us	Creating Media Digital Writing	Programming Robot Algorithms
Year Group Unit	NCCE Year 1 Unit	NCCE Year 1 Unit	NCCE Year 1 Unit	NCCE Year 2 Unit	NCCE Year 1 Unit	NCCE Year 2 Unit
Learning Journey and Outcomes	Learners will develop their understanding of technology and how it can help them in their everyday lives. They will start to become familiar with the different components of a computer by developing their keyboard and mouse skills. Learners will also consider how to use technology responsibly.	Learners will develop their understanding of a range of tools used for digital painting. They then use these tools to create their own digital paintings, while gaining inspiration from a range of artists' work. The unit concludes with learners considering their preferences when painting with and without the use of digital devices.	Learners will be introduced to early programming concepts. Learners will explore using individual commands, both with other learners and as part of a computer program. They will identify what each command for the floor robot does, and use that knowledge to start predicting the outcome of programs. The unit is paced to ensure time is spent on all aspects of programming, and builds knowledge in a structured manner. Learners are also introduced to the early stages of program design through the introduction of algorithms.	Learners will develop their understanding of what information technology (IT) is and will begin to identify examples. They will discuss where they have seen IT in school and beyond, in settings such as shops, hospitals, and libraries. Learners will then investigate how IT improves our world, and they will learn about the importance of using IT responsibly.	Learners will develop their understanding of the various aspects of using a computer to create and manipulate text. They will become more familiar with using a keyboard and mouse to enter and remove text. Learners will also consider how to change the look of their text, and will be able to justify their reasoning in making these changes. Finally, learners will consider the differences between using a computer to create text, and writing text on paper. They will be able to explain which method they prefer and explain their reasoning for choosing this.	This unit develops learners' understanding of instructions in sequences and the use of logical reasoning to predict outcomes. Learners will use given commands in different orders to investigate how the order affects the outcome. They will also learn about design in programming. They will develop artwork and test it for use in a program. They will design algorithms and then test those algorithms as programs and debug them.
Unit Focus (National Curriculum Links)	<ul style="list-style-type: none"> Recognise common uses of information technology beyond school Use technology purposefully to create, organise, store, manipulate, and retrieve digital content Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. 	<ul style="list-style-type: none"> Use technology purposefully to create, organise, store, manipulate, and retrieve digital content 	<ul style="list-style-type: none"> Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions Create and debug simple programs Use logical reasoning to predict the behaviour of simple programs Recognise common uses of information technology beyond school 	<ul style="list-style-type: none"> Use technology purposefully to create, organise, store, manipulate, and retrieve digital content Recognise common uses of information technology beyond school Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies 	<ul style="list-style-type: none"> Use technology purposefully to create, organise, store, manipulate, and retrieve digital content Use technology safely and respectfully, keeping personal information private 	<ul style="list-style-type: none"> Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions Create and debug simple programs Use logical reasoning to predict the behaviour of simple programs
Key Knowledge (See knowledge organiser)	<ul style="list-style-type: none"> To name 3 types of technology (computer, ipad, traffic lights, laptop, heating system) To locate the on switch of a laptop and a tablet. 	<ul style="list-style-type: none"> To know the icons for the shape and line tools to draw a picture. To draw lines on a screen using the line tool. 	<ul style="list-style-type: none"> To know the four commands for the Beebot – forwards, backwards, left and right. To write a simple sequence for the Beebot using all four commands. 	<ul style="list-style-type: none"> To know which devices use IT and which do not. To know that if something online is upsetting it needs to be reported to an adult. 	<ul style="list-style-type: none"> To know that the space key makes a space and backspace deletes text. To know to use the Shift key or Caps Lock to make a capital letter. 	<ul style="list-style-type: none"> To explain how the sequence of instructions in an algorithm is important. To predict the outcome of a sequence.

	<ul style="list-style-type: none"> To know that the shift key creates a capital letter. To use a keyboard and a mouse. 	<ul style="list-style-type: none"> To make marks on the screen using the shape tool. To explain how to change the colour and size of a paintbrush. 	<ul style="list-style-type: none"> To be able to debug a sequence (e.g. correct a turn). To plan and execute two different sequences to get to the same place. 	<ul style="list-style-type: none"> To name examples of how IT helps improve our world (e.g. traffic lights and how they keep us safe on the road). 	<ul style="list-style-type: none"> To select a word by double clicking. To know where the font and size icons are and what they change (font style or to make it bigger or smaller). 	<ul style="list-style-type: none"> To know when and how to debug programs. To know how a series of instructions (usually on a computer) is called an algorithm.
Prior Knowledge	<p>Pupils have explored different kinds of technology in Year R and have had experience of using laptops and tablets in small groups.</p>	<p>In Year R and in the previous unit, pupils have learnt:</p> <ul style="list-style-type: none"> How to switch their device on Username Passwords <p>In the previous unit they have learnt basic keyboard and mouse skills that they will need to apply here.</p>	<p>In Year R children have learnt how to give and follow simple instructions.</p> <p>Children who have already completed cycle B will have completed two units on programming in Scratch Jr so will have an understanding of how to write and debug algorithms in a different context.</p>	<p>In Autumn Term of Cycle A, children have learnt about types of technology and how they interact with it. They have begun to learn how to use technology respectfully and safely.</p>	<p>In Autumn Term of Cycle A, children have learnt:</p> <ul style="list-style-type: none"> To know the icons for the shape and line tools to draw a picture. To draw lines on a screen using the line tool. To make marks on the screen using the shape tool. To explain how to change the colour and size of a paintbrush. <p>They need to have prior knowledge of these skills to enable them to apply them to typing.</p>	<p>In Spring Term of Cycle A, children have learnt:</p> <ul style="list-style-type: none"> To know the four commands for the Beebot – forwards, backwards, left and right. To write a simple sequence for the Beebot using all four commands. To be able to debug a sequence (e.g. correct a turn). To plan and execute two different sequences to get to the same place. <p>Children who have already completed cycle B will have completed two units on programming in Scratch Jr so will have an understanding of how to write and debug algorithms in a different context.</p>
Future Knowledge	<ul style="list-style-type: none"> In Spring term, pupils develop their knowledge of technology further, learning in more depth about how technology helps us. 	<ul style="list-style-type: none"> Pupils will apply these skills across the curriculum when creating presentations. They will build on them in KS2 when completing units on stop frame animation and webpage creation. 	<ul style="list-style-type: none"> In Summer term of Cycle A, they will be writing algorithms for Beebots. Later programming units in LKS2 build on the skills of writing and debugging more complex algorithms. 	<ul style="list-style-type: none"> In LKS2 pupils extend their knowledge to learn about inputs, processes and outputs. They learn about computer networks and how devices are connected. This then leads them to understand how the internet is a connected network of networks. 	<ul style="list-style-type: none"> Pupils build on their digital writing skills in the 'Desktop Publishing' unit in LKS2 when they combine text and images and experiment with layout. 	<ul style="list-style-type: none"> Later programming units in LKS2 build on the skills of writing and debugging more complex algorithms.
New Skills and Knowledge to be Taught						

Computing Systems, Networks and Online Safety	<ul style="list-style-type: none"> Identify technology, a computer and its main parts. Use a mouse in different ways. Use a keyboard to type and edit text. Create rules for using technology responsibly. 			<ul style="list-style-type: none"> Recognise uses and features of information technology. Identify technology at home and beyond school. Explain how technology benefits us. Show how to use technology safely. Recognise that choices are made when using information technology. 		
Creating Media		<ul style="list-style-type: none"> Describe what different freehand tools do. Use the shape and line tools and explain choice for tools. Use a computer to paint a picture, compare painting using a computer to using paper. 			<ul style="list-style-type: none"> Use a computer to write, add and remove text. Alter font size including size and style. Compare writing the computer and on paper. 	
Data and Information						
Programming			<ul style="list-style-type: none"> Explain what a given command will do. Act out a given word Combine forwards/backwards into a sequence. Combine four direction commands into a sequence. 			<ul style="list-style-type: none"> Describe a series of instructions as a sequence. Explain what happens when we change the order of instructions. Use logical reasoning to predict the outcome of a program (series of commands). Explain that programming projects can have code and artwork. Design an algorithm, create and debug a program.
Vocabulary						
Key Vocabulary	technology computer keyboard screen click drag shift space bar safely responsibly	tool erase fill undo primary colours shape tools line tool brush style pointillism brush size	BeeBot forwards backwards turn clear go commands instructions directions plan algorithm	information technology computer barcode scan	word processor keys numbers space backspace text shift cursor toolbar bold italic	start outcome predict blocks actions change build match compare evaluate

			program route		underline select font	
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Years One and Two – Cycle B

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Focus for this Unit	Data and Information Grouping Data	Creating Media Digital Photography	Programming Programming Animations	Data and Information Pictograms	Creating Media Making Music	Programming Introduction to Quizzes
Year Group Unit	NCCE Year 1 Unit	NCCE Year 2 Unit	NCCE Year 1 Unit	NCCE Year 2 Unit	NCCE Year 2 Unit	NCCE Year 2 Unit
Learning Journey and Outcomes	This unit introduces learners to data and information. Labeling, grouping, and searching are important aspects of data and information. Searching is a common operation in many applications, and requires an understanding that to search data, it must have labels. This unit of work focuses on assigning data (images) with different labels in order to demonstrate how computers are able to group and present data.	Learners will learn to recognise that different devices can be used to capture photographs and will gain experience capturing, editing, and improving photos. Finally, they will use this knowledge to recognise that images they see may not be real.	Learners will be introduced to on-screen programming through ScratchJr. Learners will explore the way a project looks by investigating sprites and backgrounds. They will use programming blocks to use, modify, and create programs. Learners will also be introduced to the early stages of program design through the introduction of algorithms.	Learners will begin to understand what the term data means and how data can be collected in the form of a tally chart. They will learn the term 'attribute' and use this to help them organise data. They will then progress onto presenting data in the form of pictograms and finally block diagrams. Learners will use the data presented to answer questions	In this unit, learners will be using a computer to create music. They will listen to a variety of pieces of music and consider how music can make them think and feel. Learners will compare creating music digitally and non-digitally. Learners will look at patterns and purposefully create music.	This unit initially recaps on learning from the Year 1 ScratchJr unit 'Programming B – Programming animations'. Learners begin to understand that sequences of commands have an outcome, and make predictions based on their learning. They use and modify designs to create their own quiz questions in ScratchJr, and realise these designs in ScratchJr using blocks of code. Finally, learners evaluate their work and make improvements to their programming projects.
Unit Focus (National Curriculum Links)	<ul style="list-style-type: none"> Use technology purposefully to create, organise, store, manipulate, and retrieve digital content Use technology safely and respectfully 	<ul style="list-style-type: none"> Use technology purposefully to create, organise, store, manipulate, and retrieve digital content Recognise common uses of information technology beyond school Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies 	<ul style="list-style-type: none"> Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions Create and debug simple programs Use logical reasoning to predict the behaviour of simple programs 	<ul style="list-style-type: none"> use technology purposefully to create, organise, store, manipulate and retrieve digital content use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies 	<ul style="list-style-type: none"> Use technology purposefully to create, organise, store, manipulate, and retrieve digital content 	<ul style="list-style-type: none"> Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions Create and debug simple programs Use logical reasoning to predict the behaviour of simple programs Use technology purposefully to create, organise, store, manipulate and retrieve digital content
Key Knowledge (See knowledge organiser)	<ul style="list-style-type: none"> To name a group of objects using a label according to property (including size, shape or colour). To group similar objects according to the label. To group objects in more than one way. 	<ul style="list-style-type: none"> To know how to take a photograph on a device (iPad). To improve a photograph by re-taking it. To be able to change an image by adding text. To recognize images that have been changed 	<ul style="list-style-type: none"> To explain what a start block does in a program. To name and use directional blocks which move a sprite. To change the value on blocks that have numbers. 	<ul style="list-style-type: none"> To create a tally chart. To read data from a tally chart. To use a program to create a pictogram. 	<ul style="list-style-type: none"> To create a simple rhythm pattern and know that music is a pattern of different notes. To know that sounds can be represented as images or notes. To create a simple rhythm on a computer. 	<ul style="list-style-type: none"> To predict the outcome of a sequence of commands. To decide which blocks to use to meet a design. To change the background on Scratch. To know how to save and retrieve projects.

	<ul style="list-style-type: none"> To choose how to group objects and record how many objects are in a group. 	and explain how they have been changed.	<ul style="list-style-type: none"> To add and delete blocks. 			
Prior Knowledge	In Year R, pupils have collected and classified groups of things. They have developed an understanding of the terms 'similar' and 'different'.	In Year R, pupils have had experience of taking photographs using cameras and tablets. They know what a photograph is, how it is produced and that they can be edited.	In Year R, pupils have had experience of giving directions and using positional language. They know how to give and follow instructions. Children who have completed cycle A will have completed two units on programming Beebots so will have an understanding of how to write and debug algorithms in a different context.	In Autumn Term of Cycle B, children have learnt: <ul style="list-style-type: none"> To name a group of objects using a label according to property (including size, shape or colour). To group similar objects according to the label. To group objects in more than one way. To choose how to group objects and record how many objects are in a group. 	In Year R pupils have developed a secure understanding of patterns. They have listened to music on a number of different devices and have experimented with creating sounds and patterns using different instruments.	In Spring Term of Cycle B, children have learnt: <ul style="list-style-type: none"> To explain what a start block does in a program. To name and use directional blocks which move a sprite. To change the value on blocks that have numbers. To add and delete blocks. They have developed an understanding of sequencing instructions and are beginning to predict outcomes. Children who have completed cycle A will have completed two units on programming Beebots so will have an understanding of how to write and debug algorithms in a different context
Future Knowledge	<ul style="list-style-type: none"> In Spring term of cycle B, pupils learn how to present this data in pictograms. In LKS2 they learn how to make branching databases and how data can be collected, recorded and presented in lots of different ways. 	<ul style="list-style-type: none"> In LKS2, pupils build on this knowledge to edit photographs in different ways. 	<ul style="list-style-type: none"> In Summer term, they build on their knowledge of Scratch to introduce a wider range of commands and debug their algorithms. 	<ul style="list-style-type: none"> In LKS2 pupils develop their understanding of attributes (properties) using branching databases to structure data according to different object attributes. 	<ul style="list-style-type: none"> In LKS2, pupils build on these skills to edit audio and produce podcasts. 	<ul style="list-style-type: none"> In LKS2, they build on their knowledge of Scratch to introduce a wider range of commands and debug their algorithms, applying these skills in different contexts and to different projects.
New Skills and Knowledge to be Taught						
Computing Systems, Networks and Online Safety						

Creating Media		<ul style="list-style-type: none"> • Know what devices can be used to take photographs. • Use a digital device to take photographs. • Describe what makes a good photograph. • Decide how a photograph can be improved. • Use tools to change an image, recognise that images can be changed. 			<ul style="list-style-type: none"> • Say how music makes us feel. • Identify that there are patterns in music. • Describe how music can be used in different ways. • Show how music is made from a series of notes. • Create music for a purpose, review and refine computer work. 	
Data and Information	<ul style="list-style-type: none"> • Label objects • Identify that objects can be counted. • Describe objects in different ways. • Count objects with the same number of properties. • Compare groups of objects and answer questions about them. 			<ul style="list-style-type: none"> • Recognise that we can count and compare objects using tally charts. • Recognise that objects can be represented as pictures. • Create pictograms. • Select objects by attribute and make comparisons. • Recognise that people can be described by attributes. 		
Programming			<ul style="list-style-type: none"> • Choose a command for a given purpose. • Show that a series of commands can be joined together. • Identify the affect of changing a value. • Explain that each sprite has a set of its own instructions. • Design parts of a project. • Use an algorithm to create a program. 			<ul style="list-style-type: none"> • Explain that a sequence of command has a start and an outcome. • Create a program using a given design, change a given design. • Create a program using my own design. • Decide how my project can be improved.
Key Vocabulary	<p>object label group search image property colour size shape value data</p>	<p>device capture image digital landscape portrait field of view narrow wide format framing</p>	<p>command sprite compare programming area block joining command start block run background delete</p>	<p>organise tally chart votes total pictogram enter compare count explain attribute difference</p>	<p>music quiet loud feelings emotions pattern rhythm pulse/beat pitch tempo notes</p>	<p>start outcome predict blocks actions change build match compare evaluate</p>

	more less most fewest least same	focal point subject matter compose natural lighting artificial lighting flash focus background foreground editing tools filter changed real	reset predict effect change value instructions design programming blocks	most/least popular conclusion block diagram	instrument create open edit	
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Years Three and Four – Cycle A

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Focus for this Unit	Computing Systems Connecting Computers	Creating Media Stop Frame Animation	Programming Sequencing Sounds	Computing Systems The Internet	Creating Media Desktop Publishing	Programming Repetition in Games
Year Group Unit	NCCE Year 3 Unit	NCCE Year 3 Unit	NCCE Year 3 Unit	NCCE Year 4 Unit	NCCE Year 3 Unit	NCCE Year 4 Unit
Learning Journey and Outcomes	Learners will develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. They will also compare digital and non-digital devices. Next, learners will be introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. Finally, learners will discover the benefits of connecting devices in a network.	Learners will use a range of techniques to create a stop-frame animation using tablets. Next, they will apply those skills to create a story-based animation. This unit will conclude with learners adding other types of media to their animation, such as music and text.	This unit explores the concept of sequencing in programming through Scratch. It begins with an introduction to the programming environment, which will be new to most learners. They will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. The unit is paced to focus on all aspects of sequences, and make sure that knowledge is built in a structured manner. Learners also apply stages of program design through this unit.	Learners will apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet, and will be given opportunities to explore the World Wide Web for themselves in order to learn about who owns content and what they can access, add, and create. Finally, they will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information. This unit requires devices with an internet connection. Chrome Music Lab is used in one lesson to demonstrate content which can be produced on the World Wide Web.	During this unit, learners will become familiar with the terms 'text' and 'images' and understand that they can be used to communicate messages. They will use desktop publishing software and consider careful choices of font size, colour and type to edit and improve premade documents. Learners will be introduced to the terms 'templates', 'orientation', and 'placeholders' and begin to understand how these can support them in making their own template for a magazine front cover. They will start to add text and images to create their own pieces of work using desktop publishing software. Learners will look at a range of page layouts thinking carefully about the purpose of these and evaluate how and why desktop publishing is used in the real world.	This unit explores the concept of repetition in programming using the Scratch environment. It begins with a Scratch activity where learners can discover similarities between two environments. Learners look at the difference between count-controlled and infinite loops, and use their knowledge to modify existing animations and games using repetition. Their final project is to design and create a game which uses repetition, applying stages of programming design throughout.
Unit Focus (National Curriculum Links)	<ul style="list-style-type: none"> use sequence, selection, and repetition in programs; work with variables and various forms of input and output understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication and collaboration 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 	<ul style="list-style-type: none"> 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 use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. 	<ul style="list-style-type: none"> 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 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 	<ul style="list-style-type: none"> Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of 	<ul style="list-style-type: none"> Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content 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 	<ul style="list-style-type: none"> 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 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

	content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information		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	programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information <ul style="list-style-type: none"> Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. 		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
Key Knowledge (See knowledge organiser)	<ul style="list-style-type: none"> To know that networks allow us to send and receive information and to identify at least 2 networked devices (network switch, server, wireless access point) To explain that different devices have different purposes (eg. smartboard for teaching, ipad for researching). To know that an input is something that sends a message to the device. To know that a process is when the device acts on the message it has been given. To know that an output is something that is sent out by the device. 	<ul style="list-style-type: none"> To be able to explain that an animation is a sequence of pictures or images. To know that to make an animation they have to make small changes to each frame. To know that they can use techniques such as onion skinning to review and edit their work. 	<ul style="list-style-type: none"> To know that sequences of connected commands lead to outcomes. To know how to make decisions about the order of different commands to achieve different outcomes. To know that running a code can allow you to check the outcome and debug the code as needed. 	<ul style="list-style-type: none"> To know that websites and their contents are created by people. To know that information found online is not necessarily honest, accurate or legal. To know what a URL address is and how to access a website. To know that information on the internet may be copyrighted and that others cannot copy or use it without permission. 	<ul style="list-style-type: none"> To explain the difference between text and images. To be able to demonstrate how to change font size and colour on a desktop computer. To use different layouts to achieve different purposes. To know how to combine text and images to achieve a goal, explaining the choices they have made. 	<ul style="list-style-type: none"> To know that the 'pen' icon in Scratch causes the sprite to draw on the screen. To know how to draw shapes by combining the pen feature and the move and repeat blocks. To use loops to determine how many times an action is completed (count controlled and infinite). To know a sequence error is an instruction or code in the wrong place. To know a keying error is typing in the wrong code. To know a logical error is a mistake in the plan or thinking.
Prior Knowledge	<ul style="list-style-type: none"> Pupils have completed two units in KS1 that introduce them to digital and non-digital devices and the differences between them. They have developed some understanding of inputs, processes and outputs through their prior programming work in KS1. 	<ul style="list-style-type: none"> In KS1, pupils have begun to create media – they have explored digital paintings (understanding the different tools they can use) and have recorded sound. They also know how to take photographs on devices and have learnt some techniques for editing them. 	<ul style="list-style-type: none"> Pupils have completed ScratchJr blocks in KS1 and have a basic understanding of programming. They know about sprites and can program them in simple sequences to achieve planned outcomes. They have some experience of debugging and can make simple corrections to algorithms. 	<ul style="list-style-type: none"> In Autumn term of cycle A, children have begun to understand what a network is and how computers are connected. Throughout Year R, KS1 and the start of cycle A, pupils have completed work linked to safety and staying safe online. 	<ul style="list-style-type: none"> In the Digital Painting, Digital Writing and Digital Photography Units in KS1, pupils learnt the basic tools they could use with painting, writing and editing photographs. They know how to combine text and images to produce outcomes. 	<ul style="list-style-type: none"> In Spring term of cycle A, pupils have completed a unit on scratch writing simple algorithms. They have experience of debugging algorithms, identifying mistakes and correcting them. They will recognize sprites, backgrounds, event blocks and action blocks. Pupils who have already completed Cycle B will have completed a similar unit in Logo so will have some understanding of count controlled loops (but will need to apply them here to a different

						programme and a different way of writing code).
Future Knowledge	<ul style="list-style-type: none"> In Spring term of cycle A, pupils learn about the internet and how this is a series of connected networks. They extend their understanding of storage on networks. 	<ul style="list-style-type: none"> Pupils develop their video editing skills in UKS2. They apply their animation skills to the wider curriculum, making animations to show their learning in other subjects. 	<ul style="list-style-type: none"> In Summer term of cycle A, they extend their knowledge of sequencing and are introduced to the idea of repetition by creating a game in Scratch. 	<ul style="list-style-type: none"> In UKS2 pupils apply their understanding of networks and online safety to units on working collectively and collaboratively online. 	<ul style="list-style-type: none"> In UKS2, pupils apply the skills they have learnt through this unit to create webpages. They apply skills of combining text and images to presentations and activities throughout the curriculum. 	<ul style="list-style-type: none"> In UKS2 pupils extend their understanding of writing algorithms to learn the concept of selection and 'if... then...' instructions in different kinds of programs (Scratch and Crumble).
New Skills and Knowledge to be Taught						
Computing Systems, Networks and Online Safety	<ul style="list-style-type: none"> Classify input and output devices and how they are connected to each other. To know that different devices have different purposes. 			<ul style="list-style-type: none"> Is everything on the internet factual and reliable? What to do if unsuitable images are found. To describe how content can be accessed and added on the world wide web. 		
Creating Media		<ul style="list-style-type: none"> Create a storyboard and use this to create an animation that is achievable on screen. Evaluate own and others animation and use this to improve work. 			<ul style="list-style-type: none"> To recognise that text and images can communicate messages clearly and create a template for a given purpose. 	
Data and Information						
Programming			<ul style="list-style-type: none"> To use scratch to combine sound commands and put this into a sequence. 			<ul style="list-style-type: none"> To be able to explain the difference between count-controlled and infinite loops. To design and create a project that includes repetition.
Vocabulary						
Key Vocabulary	digital device, input, process output program digital non-digital connection, network, switch, server, wireless access point, cables, sockets	animation, flip book, stop-frame, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition.	Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task,	internet, network, router, security, switch, server, wireless access point (WAP), website, web page, web address, routing, web browser, World Wide Web, content, links, files, use, download,	text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste,	Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify,

			design, run the code, order, note, chord, algorithm, bug, debug, code.	sharing, ownership, permission, information, accurate, honest, content, advert	purpose, benefits.	design, algorithm, debug, refine, evaluate.
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Years 3 and Four – Cycle B

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Focus for this Unit	Data and Information Branching Databases	Creating Media Audio Editing	Programming Events and Actions in Programs	Data and Information Data Logging	Creating Media Photo Editing	Programming Repetition in Shapes
Year Group Unit	NCCE Year 3 Unit	NCCE Year 4 Unit	NCCE Year 3 Unit	NCCE Year 4 Unit	NCCE Year 4 Unit	NCCE Year 4 Unit
Learning Journey and Outcomes	Learners will develop their understanding of what a branching database is and how to create one. They will use yes/no questions to gain an understanding of what attributes are and how to use them to sort groups of objects. Learners will create physical and on-screen branching databases. To conclude the unit, they will create an identification tool using a branching database, which they will test by using it. They will also consider real-world applications for branching databases.	Learners will identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally. Learners will discuss the ownership of digital audio and the copyright implications of duplicating the work of others. In order to record audio themselves, learners will use Audacity to produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files. Finally, learners will evaluate their work and give feedback to their peers.	This unit explores the links between events and actions, whilst consolidating prior learning relating to sequencing. Learners will begin by moving a sprite in four directions (up, down, left and right). They will then explore movement within the context of a maze, using design to choose an appropriately sized sprite. This unit also introduces programming extensions, through the use of pen blocks. Learners are given the opportunity to draw lines with sprites and change the size and colour of lines. The unit concludes with learners designing and coding their own maze tracing program.	In this unit, pupils will consider how and why data is collected over time. Pupils will consider the senses that humans use to experience the environment and how computers can use special input devices called sensors to monitor the environment. Pupils will collect data as well as access data captured over long periods of time. They will look at data points, data sets, and logging intervals. Pupils will spend time using a computer to review and analyse data. Towards the end of the unit, pupils will pose questions and then use data loggers to automatically collect the data needed to answer those questions.	Learners will develop their understanding of how digital images can be changed and edited, and how they can then be resaved and reused. They will consider the impact that editing images can have, and evaluate the effectiveness of their choices.	This unit looks at repetition and loops within programming. Pupils will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language.
Unit Focus (National Curriculum Links)	<ul style="list-style-type: none"> 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 use technology safely, respectfully and responsibly 	<ul style="list-style-type: none"> Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content 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 Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact 	<ul style="list-style-type: none"> 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 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 	<ul style="list-style-type: none"> Use sequence, selection, and repetition in programs; work with variables and various forms of input and output 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 	<ul style="list-style-type: none"> 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 Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact 	<ul style="list-style-type: none"> 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 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			collecting, analysing, evaluating and presenting data and information
Key Knowledge (See knowledge organiser)	<ul style="list-style-type: none"> To give an example of an open ended question and a yes/no question. To know that objects in a branching database need to be split into similar sized groups. 	<ul style="list-style-type: none"> To identify the uses for recorded audio (music, podcasts etc.). To know how to use a computer to record audio. To know the difference between saving an audio file and exporting an audio file. To know how to combine sounds to make a piece of audio more engaging. 	<ul style="list-style-type: none"> To know that event blocks are yellow and movement blocks are darker blue on scratch. To know that 'event' blocks are used to sense different events happening and are needed for every project. To know that 'action' blocks are outcomes that happen when event blocks are triggered. 	<ul style="list-style-type: none"> To know that data loggers and logging software can be used to automatically capture data that can be used to answer research questions. Identifies a suitable time frame to collect data to answer their question and where the data logger needs to be placed. Makes statements about what their data shows and uses their collected data to answer their question. 	<ul style="list-style-type: none"> To be able to explain the reasons why somebody might want to change the composition of an image. To know how to use the following tools to create an image: crop, rotate, flip, copy and paste. To know that the appearance of an image can be changed by editing the colour, brightness and contrast (and how to do this). To give examples of positive and negative effects that editing an image may have. 	<ul style="list-style-type: none"> To be able to identify patterns of repetition in real life (brushing teeth, dance). To write algorithms in Logo to produce an expected outcome. To know how to break down tasks into smaller steps and plan codes to achieve these small steps.
Prior Knowledge	<ul style="list-style-type: none"> Pupils have learnt how to group data in KS1. They have created pictograms with data and can read and record information in tally charts. 	<ul style="list-style-type: none"> In KS1 pupils have learnt how to make music and simple rhythms on a music programme. If Cycle A has already been completed, children will have some experience of adding sounds to a stop frame animation project. 	<ul style="list-style-type: none"> Pupils have completed ScratchJr blocks in KS1 and have a basic understanding of programming. They know about sprites and can program them in simple sequences to achieve planned outcomes. They have some experience of debugging and can make simple corrections to algorithms. 	<ul style="list-style-type: none"> In KS1 pupils have learnt about answering questions with data. In the Autumn term, they developed their understanding of different question types by creating branching databases. 	<p>In KS1 pupils have learnt:</p> <ul style="list-style-type: none"> To know how to take a photograph on a device (iPad). To improve a photograph by re-taking it. To be able to change an image by adding text. To recognize images that have been changed and explain how they have been changed. 	<ul style="list-style-type: none"> Pupils who have already completed Cycle A will have completed a similar unit in Scratch Jr so will have some understanding of count controlled loops (but will need to apply them here to a different programme and a different way of writing code). In KS1 pupils have combined sequences of actions and instructions to achieve given outcomes.
Future Knowledge	<ul style="list-style-type: none"> In Spring term of cycle B, pupils learn about automatic data collection and how this can be presented. In UKS2, they learn about presenting data in tables and graphs. 	<ul style="list-style-type: none"> In UKS2 pupils apply their understanding of recording sound to video editing. 	<ul style="list-style-type: none"> In UKS2 they extend their knowledge of sequencing and are introduced to the idea of repetition by creating a game in Scratch. 	<ul style="list-style-type: none"> In UKS2, pupils build on the idea of data being contained in tables and graphs when they complete units on flat file databases and spreadsheets. 	<ul style="list-style-type: none"> In UKS2 pupils further develop their image editing skills in the Vector drawing unit when they combine different techniques to create images. 	<ul style="list-style-type: none"> In UKS2 pupils extend their understanding of writing algorithms to learn the concept of selection and 'if... then...' instructions in different kinds of programs (Scratch and Crumble).
New Skills and Knowledge to be Taught						
Computing Systems, Networks and Online Safety						

Creating Media		<ul style="list-style-type: none"> To use a digital device to record sound. To explain that audio can be changed through editing. 			<ul style="list-style-type: none"> To explain that digital images can be changed. To recognise that not all images are accurate. 	
Data and Information	<ul style="list-style-type: none"> To make up yes/no questions about a collection of objects. To be able to sort objects from their own yes/no questions and put this information into a tree structure. 			<ul style="list-style-type: none"> To know that data gathered over time can be used to answer questions. To use collected data to answer questions. 		
Programming			<ul style="list-style-type: none"> To be able to choose a character that is a sensible size to go in their maze game. To use codes to determine an outcome. To evaluate and implement their designs. 			<ul style="list-style-type: none"> To be able to write an algorithm to produce a given outcome. To design a program that includes count-controlled loops.
Vocabulary						
Key Vocabulary	attribute, value, questions, table, objects, branching, database, objects, equal, even, separate, structure, compare, order, organise, selecting, information, decision tree.	audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback.	motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, action, debugging, errors, setup, code, test, debug, actions.	data, table, layout, input device, sensor, logger, logging, data point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.	image, edit, digital, crop, rotate, undo, save, adjustments, effects, colours, hue, saturation, sepia, vignette, image, retouch, clone, select, combine, made up, real, composite, cut, copy, paste, alter, background, foreground, zoom, undo, font.	Logo (programming environment), program, turtle, commands, code snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled loop, value, trace, decompose, procedure.

Years Five and Six – Cycle A

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Focus for this Unit	Data and Information Flat File Databases	Creating Media Vector Drawing	Programming Selection in Physical Computing	Data and Information Introduction to Spreadsheets	Creating Media 3D Modelling	Programming Selection in Quizzes
Year Group Unit	NCCE Year 5 Unit	NCCE Year 5 Unit	NCCE Year 5 Unit	NCCE Year 6 Unit	NCCE Year 6 Unit	NCCE Year 5 Unit
Learning Journey and Outcomes	This unit looks at how a flat-file database can be used to organise data in records. Pupils use tools within a database to order and answer questions about data. They create graphs and charts from their data to help solve problems. They use a real-life database to answer a question, and present their work to others.	In this unit, learners start to create vector drawings. They learn how to use different drawing tools to help them create images. Learners recognise that images in vector drawings are created using shapes and lines, and each individual element in the drawing is called an object. Learners layer their objects and begin grouping and duplicating them to support the creation of more complex pieces of work. This unit is planned using the Google Drawings app, other alternative pieces of software are available.	In this unit, learners will use physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. Learners will be introduced to a microcontroller (Crumble controller) and learn how to connect and program components (including output devices- LEDs and motors) through the application of their existing programming knowledge. Learners are introduced to conditions as a means of controlling the flow of actions and make use of their knowledge of repetition and conditions when introduced to the concept of selection (through the if, then structure).	This unit introduces the learners to spreadsheets. They will be supported in organising data into columns and rows to create their own data set. Learners will be taught the importance of formatting data to support calculations, while also being introduced to formulas and will begin to understand how they can be used to produce calculated data. Learners will be taught how to apply formulas that include a range of cells, and apply formulas to multiple cells by duplicating them. Learners will use spreadsheets to plan an event and answer questions. Finally, learners will create charts, and evaluate their results in comparison to questions asked.	Learners will develop their knowledge and understanding of using a computer to produce 3D models. Learners will initially familiarise themselves with working in a 3D space, moving, resizing, and duplicating objects. They will then create hollow objects using placeholders and combine multiple objects to create a model of a desk tidy. Finally, learners will examine the benefits of grouping and ungrouping 3D objects, then go on to plan, develop, and evaluate their own 3D model of a building.	In this unit, pupils develop their knowledge of selection by revisiting how conditions can be used in programs and then learning how the If... Then... Else structure can be used to select different outcomes depending on whether a condition is true or false. They represent this understanding in algorithms and then by constructing programs using the Scratch programming environment. They use their knowledge of writing programs and using selection to control outcomes to design a quiz in response to a given task and implement it as a program.
Unit Focus (National Curriculum Links)	<ul style="list-style-type: none"> Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content 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 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact 	<ul style="list-style-type: none"> 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 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			given goals, including collecting, analysing, evaluating and presenting data and information
Key Knowledge (See knowledge organiser)	<ul style="list-style-type: none"> Can explain that programs can be used to compare data. Can explain how information can be grouped. Can explain what a field and record is in a database. Can create a chart and a graph from a database. 	<ul style="list-style-type: none"> Know that vector drawing has different layers/shapes. Know drawing tools can be used to produce different outcomes. Can use alignment grids effectively to improve consistency. Can group objects to make them easier to work with. 	<ul style="list-style-type: none"> Know that a loop can be stopped when a condition is met. Can explain a loop can be used to repeatedly check when a condition has been met (or not). Can use selection to produce an intended outcome. 	<ul style="list-style-type: none"> Can explain that objects can be described using data. Knows that a formula must start with an = sign. Knows that data can be best represented in tables or graphs. Can create formulas to calculate data to answer questions. 	<ul style="list-style-type: none"> Can name the 3D shapes needed to create a model of a real-world object. Can explain why we might represent 3D objects on a computer. Can rotate, duplicate, group, resize and recolour objects in a 3D model. 	<ul style="list-style-type: none"> Can explain how selection is used in computer programs. Explain how selection affects the program. Can use infinite loops to check a condition. Can test and debug programs confidently.
Prior Knowledge	<p>In LKS2 pupils learnt:</p> <ul style="list-style-type: none"> To give an example of an open ended question and a yes/no question. To know that objects in a branching database need to be split into similar sized groups. <p>They used data loggers to collect data:</p> <ul style="list-style-type: none"> To know that data loggers and logging software can be used to automatically capture data that can be used to answer research questions. Identifies a suitable time frame to collect data to answer their question and where the data logger needs to be placed. Makes statements about what their data shows and uses their collected data to answer their question. 	<p>In LKS2 when completing the Desktop Publishing unit, pupils learnt how to manipulate digital images (skills they will need to apply here):</p> <ul style="list-style-type: none"> To explain the difference between text and images. To be able to demonstrate how to change font size and colour on a desktop computer. To use different layouts to achieve different purposes. To know how to combine text and images to achieve a goal, explaining the choices they have made. 	<p>Pupils have completed a number of units on Scratch and so have an understanding of block based language.</p> <p>They understand the concepts of repetition and sequence.</p> <p>They have an understanding of some of the language of programming e.g. if... then....</p>	<p>In LKS2 pupils used data loggers to collect data and learnt:</p> <ul style="list-style-type: none"> To know that data loggers and logging software can be used to automatically capture data that can be used to answer research questions. Identifies a suitable time frame to collect data to answer their question and where the data logger needs to be placed Makes statements about what their data shows and uses their collected data to answer their question. <p>Earlier this year they also learnt about databases:</p>	<p>In LKS2 pupils have edited 2D images using similar tools:</p> <ul style="list-style-type: none"> To be able to explain the reasons why somebody might want to change the composition of an image. To know how to use the following tools to create an image: crop, rotate, flip, copy and paste. To know that the appearance of an image can be changed by editing the colour, brightness and contrast (and how to do this). To give examples of positive and negative effects that editing an image may have. 	<p>Pupils have completed a number of units on Scratch and so have an understanding of block based language.</p> <p>They understand the concepts of repetition and sequence.</p> <p>In Spring term they were introduced to the concept of 'selection' in the context of using crumble controllers and are now applying this to a new context.</p>
Future Knowledge	<p>Later in this cycle, pupils be introduced to spreadsheets and will extend their understanding of tools that can be used to explore data.</p>	<p>Later in this cycle, pupils will apply these skills to 3D modelling:</p> <ul style="list-style-type: none"> Can name the 3D shapes needed to create a model of a real-world object. Can explain why we might represent 3D objects on a computer. Can rotate, duplicate, group, resize and 	<ul style="list-style-type: none"> In the Summer term of this cycle, they will extend their understanding of selection and apply it to programming in a new context. 	<ul style="list-style-type: none"> KS3 	<ul style="list-style-type: none"> KS3 	<ul style="list-style-type: none"> KS3

		recolour objects in a 3D model.				
Computing Systems, Networks and Online Safety						
Creating Media		<ul style="list-style-type: none"> To create a vector drawing by combining shapes. To group objects to further develop their work. 			<ul style="list-style-type: none"> To use a computer to create and manipulate 3D digital objects. To compare working digitally with 2D and 3D graphics. To construct a digital 3D model of a physical object. To develop and improve a digital 3D model. 	
Data and Information	<ul style="list-style-type: none"> To use a form to record information and compare this to a paper based database. To create charts and graphs to represent data, 			<ul style="list-style-type: none"> To explain that formula can be used to produce calculated data. To apply formulas to data, including duplicating. To choose suitable ways to present data. 		
Programming			<ul style="list-style-type: none"> To build and control a simple circuit connected to a computer. To write a program that includes count-controlled loops. Design a physical project that includes selection. To create a controllable system that includes selection. 			<ul style="list-style-type: none"> To design a program which uses selection. To create a program which uses selection. To evaluate their own program.
Key Vocabulary	database record field sort order group search value criteria graph	vector drawing tools icons toolbar vector drawing move resize rotate duplicate/copy organise	programming if...then....else variable random direction navigation motion sensor input output motor	spreadsheet data handling cells columns and rows data format common attribute formula calculation cell reference	modelling three-dimensional workspace faces vertices edges handles resize position hole	selection condition true false count controlled loop outcomes conditional statement

	chart axis compare filter	zoom select alignment grid handles	alarm signal	operation range graph chart evaluate results comparison	design modify	
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Years Five and Six – Cycle B

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Focus for this Unit	Computing Systems Systems and Searching	Creating Media Video Editing	Programming Variables in Games	Computing Systems Communication and Collaboration	Creating Media Web Page Creation	Programming Sensing Movement
Year Group Unit	NCCE Year 5 Unit	NCCE Year 5 Unit	NCCE Year 6 Unit	NCCE Year 6 Unit	NCCE Year 6 Unit	NCCE Year 6 Unit
Learning Journey and Outcomes	Learners develop their understanding of computer systems and how information is transferred between systems and devices. Learners consider small-scale systems as well as large-scale systems. They explain the input, output, and process aspects of a variety of different real-world systems. Learners discover how information is found on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines.	This unit gives learners the opportunity to learn how to create short videos in groups. As they progress through this unit, they will be exposed to topic-based language and develop the skills of capturing, editing, and manipulating video. Active learning is encouraged through guided questions and by working in small groups to investigate the use of devices and software. Learners are guided with step-by-step support to take their idea from conception to completion. At the teacher's discretion, the use of green screen can be incorporated into this unit. At the conclusion of the unit, learners have the opportunity to reflect on and assess their progress in creating a video.	This unit explores the concept of variables in programming through games in Scratch. First, learners find out what variables are and relate them to real-world examples of values that can be set and changed. Then they use variables to create a simulation of a scoreboard. In Lessons 2, 3, and 5, which follow the Use-Modify-Create model, learners experiment with variables in an existing project, then modify them, before they create their own project. In Lesson 4, learners focus on design. Finally, in Lesson 6, learners apply their knowledge of variables and design to improve their games in Scratch.	In this unit learners explore how data is transferred over the internet. Learners initially focus on addressing, before they move on to the makeup and structure of data packets. Learners then look at how the internet facilitates online communication and collaboration; they complete shared projects online and evaluate different methods of communication. Finally, they learn how to communicate responsibly by considering what should and should not be shared on the internet. Note: Some of the content in this unit was previously included in the Year 5 – 'Computer systems and networks' unit, so some learners may have already completed similar activities. Where this is the case, the context for the activity has been changed.	This unit introduces learners to the creation of websites for a chosen purpose. Learners identify what makes a good web page and use this information to design and evaluate their own website using Google Sites. Throughout the process learners pay specific attention to copyright and fair use of media, the aesthetics of the site, and navigation paths.	This unit is the final KS2 programming unit and brings together elements of all the four programming constructs: sequence from Year 3, repetition from Year 4, selection from Year 5, and variables (introduced in Year 6 – 'Programming A'). It offers pupils the opportunity to use all of these constructs in a different, but still familiar environment, while also utilising a physical device — the micro:bit. The unit begins with a simple program for pupils to build in and test within the new programming environment, before transferring it to their micro:bit. Pupils then take on three new projects in Lessons 2, 3, and 4, with each lesson adding more depth.
Unit Focus (National Curriculum Links)	<ul style="list-style-type: none"> Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content 	<ul style="list-style-type: none"> Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content 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 Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range 	<ul style="list-style-type: none"> 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 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 	<ul style="list-style-type: none"> Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration 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 	<ul style="list-style-type: none"> Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content 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. use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour. 	<ul style="list-style-type: none"> 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 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

		<p>of ways to report concerns about content and contact</p> <ul style="list-style-type: none"> Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour 	<p>create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</p>	<ul style="list-style-type: none"> Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact 		<p>create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</p>
Key Knowledge (See knowledge organiser)	<ul style="list-style-type: none"> Can describe that a computer system uses an input, process and an output. Can explain that different media files and information can be shared on the internet either privately or publicly. Can refine web searches to find specific information, explaining the terms they used and why. Can explain how search engines can be influenced and the limitations of some search engines. 	<ul style="list-style-type: none"> Can recognise videos are moving images which may include sound. Can capture video using a range of techniques. Can store, retrieve and export recordings to a computer. Can make simple edits to a video. Can identify what makes an effective/appealing video. 	<ul style="list-style-type: none"> Can define a variable as something that is changeable. Can explain why a variable is used in a program. Can choose how to improve a game using variables. 	<ul style="list-style-type: none"> Can explain that search results are ordered. Can explain how key words can be used within a search. Can name a variety of ways of communicating over the internet (email, social media post, comment field, blog, vlog) Can explain how to communicate safely on a range of devices. 	<ul style="list-style-type: none"> Can define what is meant by the terms copyright and fair use. Can describe how pages of a website are linked together through the use of hyperlinks. Can create hyperlinks. Can add content to a webpage. 	<ul style="list-style-type: none"> Can explain that some devices need sensors in order to help it make decisions about where to go and where to stop. Can explain that what a device senses can change or control the flow of a program. Can create a project that uses inputs and outputs on a controllable device.
Prior Knowledge	<p>In LKS2 children learnt:</p> <ul style="list-style-type: none"> To know that websites and their contents are created by people. To know that information found online is not necessarily honest, accurate or legal. To know what a URL address is and how to access a website. To know that information on the internet may be copyrighted and that others cannot copy or use it without permission. 	<p>In LKS2, children created stop frame animations and learnt:</p> <ul style="list-style-type: none"> To be able to explain that an animation is a sequence of pictures or images. To know that to make an animation they have to make small changes to each frame. To know that they can use techniques such as onion skinning to review and edit their work. <p>They also developed skills in photo editing (the composition and editing skills are built on in this unit):</p> <ul style="list-style-type: none"> To be able to explain the reasons why somebody might want to change the composition of an image. To know how to use the following tools to create an image: crop, rotate, flip, copy and paste. To know that the appearance of an image 	<p>Pupils are familiar with the following concepts in Scratch having completed units of work involving them:</p> <ul style="list-style-type: none"> Sequence Repetition Selection <p>If pupils have not completed Year 5/6 cycle A, they may need some support with aspects of selection.</p>	<p>This unit builds on the 'System and Searching' unit from earlier in this cycle where children learnt:</p> <ul style="list-style-type: none"> Can describe that a computer system uses an input, process and an output. Can explain that different media files and information can be shared on the internet either privately or publicly. Can refine web searches to find specific information, explaining the terms they used and why. Can explain how search engines can be influenced and the limitations of some search engines. 	<p>This unit draws together the knowledge completed from the following units:</p> <ul style="list-style-type: none"> Digital Writing (KS1) Digital Painting (KS1) Desktop Publishing (LKS2) Digital Photography (LKS2) Photo Editing (LKS2) <p>Some pupils will also have completed the Vector Drawing unit from Cycle A and will be able to apply their skills here.</p>	<p>In KS2, pupils have become familiar with the following concepts in Scratch having completed units of work involving them:</p> <ul style="list-style-type: none"> Sequence Repetition Selection <p>Earlier in this cycle, they explored variables:</p> <ul style="list-style-type: none"> Can define a variable as something that is changeable. Can explain why a variable is used in a program. Can choose how to improve a game using variables.

		<p>can be changed by editing the colour, brightness and contrast (and how to do this).</p> <ul style="list-style-type: none"> To give examples of positive and negative effects that editing an image may have. 				
Future Knowledge	<p>Later in this cycle, pupils extend their understanding of online communication and collaboration:</p> <ul style="list-style-type: none"> Can explain that search results are ordered. Can explain how key words can be used within a search. Can name a variety of ways of communicating over the internet (email, social media post, comment field, blog, vlog) Can explain how to communicate safely on a range of devices. <p>They apply these skills when creating their own webpages.</p> <ul style="list-style-type: none"> Can define what is meant by the terms copyright and fair use. Can describe how pages of a website are linked together through the use of hyperlinks. Can create hyperlinks. Can add content to a webpage. 	<ul style="list-style-type: none"> KS3 	<p>Later in this cycle, pupils extend their concept of variables to include sensors:</p> <ul style="list-style-type: none"> Can explain that some devices need sensors in order to help it make decisions about where to go and where to stop. Can explain that what a device senses can change or control the flow of a program. Can create a project that uses inputs and outputs on a controllable device. 	<ul style="list-style-type: none"> KS3 	<ul style="list-style-type: none"> KS3 	<ul style="list-style-type: none"> KS3
New Skills and Knowledge to be Taught						
Computing Systems, Networks and Online Safety	<ul style="list-style-type: none"> Can send information over the internet in different ways. Can create a project which can be shared online. Can identify different ways of working online together. 			<ul style="list-style-type: none"> To identify how to use a search engine. To recognise why the order of results is important, and to whom. To recognise how we communicate using technology. To evaluate different methods of online communication. 		

Creating Media		<ul style="list-style-type: none"> • Can capture, edit and reshoot video using a digital device. • Consider the impact of the choices made when making and sharing a video. 			<ul style="list-style-type: none"> • To review an existing website and consider its structure. • To plan the features of a web page. • To consider the ownership and use of images (copyright). • To recognise the need to preview pages. • To be able to identify whether content is or is not copyrighted. 	
Data and Information						
Programming			<ul style="list-style-type: none"> • To choose how to improve a game by using variables. • To design a project that builds on a given example. • To use a design to create a project. • To evaluate a project. 			<ul style="list-style-type: none"> • To create a program to run on a controllable device. • To effectively include a sensor on a device such as a motion or tilt sensor. • To use a variable in an if... then.... else... statement to select the flow of a program. • To design a project that uses inputs and outputs on a controllable device. • To develop a program to use inputs and outputs on a controllable device.
Vocabulary						
Key Vocabulary	system connection digital input process output protocol address chat IP address collaboration	video audio recording storyboard script soundtrack dialogue capture zoon AV (audio-visual) videographer video techniques - zoom, pan, tilt, angle lighting setting export split trim/clip titles timeline transitions content	variable change name value set design event code task test motion callout	search engine refine index web crawler ranking links searching selection communication public private SMS blog world wide web	website web page browser media Hypertext Markup Language (HTML) logo layout header purpose copyright home page preview navigation subpage external link embed	programming if...then...else variable random direction navigation motion sensor input output motor alarm signal

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