

COMPUTING AT DOWNSVIEW

Our Vision (Intent)

At Downsview, we strive to develop a curriculum relevant to the continuous technological developments of the 21st Century and which reflects the experiences of our children. We recognise that our children need to be given the computational and digital knowledge and skills that prepare them for being able to understand technological change and to be enabled to adapt to future technological developments. This is achieved by a high-quality computing education that equips pupils to use computational thinking and ensures that all pupils are responsible, competent, confident and creative users of their technological world.

Knowledge organisation within the computing curriculum uses the *National Centre for Computing Education's (NCCE)* computing taxonomy to ensure comprehensive coverage of the subject. This has been developed through a thorough review of the KS1–4 computing programme of study, and the GCSE and A level computer science specifications across all awarding bodies. All learning outcomes can be described through a high-level taxonomy of ten strands:

- **Computer Systems & Networks** — Understand what a computer is, and how its constituent parts function together as a whole. Understand how networks can be used to retrieve and share information, and how they come with associated risks
- **Creating media** — Select and create a range of media including text, images, sounds, and video
- **Data and information** — Understand how data is stored, organised, and used to represent real-world artefacts and scenarios
- **Programming** — Create software to allow computers to solve problems

How we plan and teach Computing (Implementation)

The units for key stages 1 and 2 are based on a spiral curriculum. This means that each of the themes is revisited regularly (at least once in each year group), and pupils revisit each theme through a new unit that consolidates and builds on prior learning within that theme. This style of curriculum design reduces the amount of knowledge lost through forgetting, as topics are revisited yearly. It also ensures that connections are made even if different teachers are teaching the units within a theme in consecutive years.

The school is resourced for Computing delivery, including the use of high-quality laptops and iPads supported by high speed and secure internet connection throughout the school.




How we evaluate learning in Computing (Impact)




The impact of our computing curriculum can clearly be seen in projects that children create as well as presentations created as digital content. Teachers review children's learning in each lesson to evaluate strengths and plan for next steps. Programs that children write code for are saved digitally and accessed by teachers to ensure achievement of learning objectives and progression through the curriculum. Children have the opportunity to self-assess the content they have created, as well as peer-assess. In each year group, children use past learned skills and apply them to new software and coding programs that they are exploring.

COMPUTING CURRICULUM

Progression of Skills & Knowledge




Year Group	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
	Computing Systems and Networks	Creating Media	Programming A	Data and Information	Creating Media	Programming B
One	Technology around us	Digital Painting	Moving a Robot	Grouping Data	Digital Writing	Introduction to Animation
Two	IT Around Us	Digital Photography	Robot Algorithms	Pictograms	Making Music	An introduction to quizzes
Three	Connecting Computers	Animation	Sequencing in Music	Branching Databases	Desktop Publishing	Events and Actions
Four	The Internet	Audio Editing	Repetition in Shapes	Data Logging	Photo Editing	Repetition in Games
Five	Sharing Information	Video Editing	Selection in Physical Computing	Flat-File Databases	Vector Drawing	Selection in Quizzes
Six	Communication	Web Page Creation	Variables in Games	Spreadsheets	3-D Modelling	Sensing




YEAR ONE			
Unit	Technology Around Us	Digital Painting	Moving a Robot
NC	<p><i>To use technology purposefully to create, organise, store, manipulate and retrieve digital content.</i></p> <p><i>To recognise common uses of information technology beyond school.</i></p> <p><i>To 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.</i></p>	<p><i>Use technology purposefully to create, organise, store, manipulate and retrieve digital content</i></p>	<p>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</p>
Thread	 Computing Systems and Networks	 Creating Media	 Programming
Overview	<p>Our key learning will aim to develop pupils' 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.</p>	<p>Learners will get to know the main parts of a desktop or laptop computer. They will practise turning on and logging in to a computer. The learners will apply their knowledge of the different parts of a computer, to complete a mouse-based task.</p>	<p>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</p>
Key questions	<ul style="list-style-type: none"> • What technology exists around me? • What technology do I use? • How do I use a mouse and keyboard? • How can I use computers safely and responsibly 	<ul style="list-style-type: none"> • How can we paint using computers? • How do shapes and lines affect my art? • Why did I choose to do that? • How is my computer art different from, and similar, to painting? 	<ul style="list-style-type: none"> • What is a robot? • What commands can we give to a robot? • What should we do when our commands do not work? • Why is prediction and planning important in programming?
Knowledge	<p>Prior knowledge: As this is a Year 1 unit, no prior knowledge is assumed. This unit progresses students' knowledge and understanding of technology and how they interact with it in school. Learners will build their knowledge of parts of a computer and develop the basic skills needed to effectively use a computer keyboard and mouse.</p> <p>Future knowledge: This unit directly precedes the Y2 Computer systems and networks unit, IT around us</p>	<p>Prior knowledge: Learners should be familiar with how to switch their device on, usernames & passwords.</p> <p>Future knowledge: This unit directly precedes the Y2 Computer systems and networks unit, IT around us</p>	<p>Prior knowledge: As this is a Year 1 unit, no prior knowledge is assumed.</p> <p>Future knowledge: It moves from giving instructions to each other to giving instructions to a robot by programming it.</p>
Specific Vocabulary	Technology, computer, desktop, laptop, mouse, keyboard, icon, file	Freehand, Line, Shape	Command, Clear Memory, Left/ Right, Debug

Unit	Grouping Data	Digital Writing	An Introduction to Animation
NC	<i>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.</i>	<i>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.</i>	<i>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</i>
Thread	 Data and Information	 Creating Media	 Programming
Overview	This unit introduces pupils to data and information. They will begin by using labels to put objects into groups and labelling these groups. Pupils will demonstrate that they can count a small number of objects, before and after the objects are grouped. They will begin to demonstrate their ability to sort objects into different groups. Finally, pupils will use their ability to sort objects into different groups to answer questions about data.	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.	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.
Key questions	<ul style="list-style-type: none"> • How can we describe and sort different objects? • Can objects be grouped in different ways? • What questions we ask and answer about our groups? 	<ul style="list-style-type: none"> • How can I add and remove text? • What function do different keys have on a keyboard? • Why have I made that choice? • What is the difference between writing and typing? 	
Knowledge	<p>Prior knowledge: This unit will introduce learners to data and information. It will introduce learners to the concept of labelling and grouping objects based on their properties.</p> <p>Future knowledge: . Following this unit, in year 2, learners will present data graphically in pictograms.</p>	<p>Prior knowledge: This unit progresses the learners' knowledge and understanding of using computers to create and manipulate digital content, focussing on using a word processor. The learners will develop their ability to find and use the keys on a keyboard in order to create digital content.</p> <p>Future knowledge: Following this unit, learners will further develop their digital writing skills in the Year 3 – 'Desktop publishing' unit and the Year 6 – 'Web page development' unit.</p>	<p>Prior knowledge: This unit progresses learners' knowledge and understanding of programming and follows on from 'Programming A – Moving a robot', where children will have learned to program a floor robot using instructions.</p> <p>Future knowledge:</p>

Specific Vocabulary	Data, Object, Label, Group, Property		Word processor, Type, Keys, Caps Lock, Cursor, Delete, Backspace				
		Technology Around Us	Digital Painting	Moving a Robot	Grouping Data	Digital Writing	An Introduction to Animation
Knowledge Progression	1	To identify technology	To describe what different freehand tools do	To explain what a given command will do	To label objects	To use a computer to write	To choose a command for a given purpose
	2	To identify a computer and its main parts	To use the shape tool and the line tools	To act out a given word	To identify that objects can be counted	To add and remove text on a computer	To show that a series of commands can be joined together
	3	To use a mouse in different ways	To make careful choices when painting a digital picture	To combine 'forwards' and 'backwards' commands to make a sequence	To describe objects in different ways	To identify that the look of text can be changed on a computer	To identify the effect of changing a value
	4	To use a keyboard to type on a computer	To explain why I chose the tools I used	To combine four direction commands to make sequences	To count objects with the same properties	To make careful choices when changing text	To explain that each sprite has its own instructions
	5	To use the keyboard to edit text	To use a computer on my own to paint a picture	To plan a simple program	To compare groups of objects	To explain why I used the tools that I chose	To design the parts of a project
	6	To create rules for using technology responsibly	To compare painting a picture on a computer and on paper	To find more than one solution to a problem	To answer questions about groups of objects	To compare typing on a computer to writing on paper	To use my algorithm to create a program

YEAR TWO

Unit	IT Around Us	Digital Photography	Robot Algorithms
NC	<p>To use technology purposefully to create, organise, store, manipulate and retrieve digital content. To recognise common uses of information technology beyond school. To 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. Use technology purposefully to create, organise, store, manipulate and retrieve digital content.</p>		<p>To use technology purposefully to create, organise, store, manipulate and retrieve digital content. To recognise common uses of information technology beyond school. To 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. Use technology purposefully to create, organise, store, manipulate and retrieve digital content</p>
Thread	 Computing Systems and Networks	 Creating Media	 Programming
Overview	<p>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.</p>	<p>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.</p>	<p>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 design algorithms and then test those algorithms as programs and debug them.</p>
Key questions	<ul style="list-style-type: none"> • What is IT? • How do we use IT in and out of school? • What are the benefits of IT? • How do we use IT safely? 	<ul style="list-style-type: none"> • What is the difference between landscape and portrait photographs? • How does light and shade affect photographs? • What makes a 'good' photograph? • How do we know if a photograph is real? 	<ul style="list-style-type: none"> • What commands can we give to a robot? • What is an algorithm? • How can we debug an algorithm if it is not working? • Why is making predictions important when programming?
Knowledge	<p>Prior knowledge: This unit progresses learners' understanding of technology and how they interact with it.</p> <p>Future knowledge: They will develop this understanding to become familiar with the term information technology and will be able to identify common features of IT</p>	<p>Prior knowledge: This unit begins the learners' understanding of how photos are captured and can be manipulated for different purposes.</p> <p>Future knowledge: Following this unit, learners will develop their photo editing skills in Year 4.</p>	<p>Prior knowledge: In year 1, the pupils should have had some experience of creating short programs using floor robots and predicting the outcome of a simple program.</p> <p>Future knowledge: Learners will use this knowledge and logical reasoning to trace programs and predict outcomes.</p>

Specific Vocabulary	Information Technology, Computer, barcode, scanner/ scan	Photograph, Digital, Landscape, Portrait, Pixel, Focus	Instructions, Sequence, Algorithm, Programming, Decomposition, Debugging
Unit	Pictograms	Making Music	An Introduction to Quizzes
NC	<i>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.</i>	<i>Use technology purposefully to create, organise, store, manipulate and retrieve digital content</i>	<i>To use technology purposefully to create, organise, store, manipulate and retrieve digital content. To recognise common uses of information technology beyond school. To 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.</i>
Thread	 Data and Information	 Creating Media	 Programming
Overview	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.	Learners will explore how music can make them think and feel. They will make patterns and use those patterns to make music with both percussion instruments and digital tools. They will also create different rhythms and tunes, using the movement of animals for inspiration. Finally, learners will share their creations and compare creating music digitally and non-digitally.	In this unit, 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.
Key questions	<ul style="list-style-type: none"> • What is data? • Why is it sometimes better to present data using IT? • What is an attribute? 	<ul style="list-style-type: none"> • How does music make me feel? • What is the difference between 'rhythms' and 'melody'? • How does a change in tempo affect the music? • How can music be created digitally? 	<ul style="list-style-type: none"> • How can I change/ modify designs to suit my purpose? • What will make my quiz appealing? • How can I improve my design?
Knowledge	<p>Prior knowledge: This unit progresses students' knowledge and understanding of grouping data. It builds on the Year 1 Data and Information unit where learners labelled objects and grouped them based on different properties</p> <p>Future knowledge: In Year 3 learners develop their understanding of attributes (properties) using branching databases to structure data according to different object attributes.</p>	<p>Prior knowledge: Learners should have experience of making choices on a tablet/computer, and they should be able to navigate within an application. Learners should also have some experience of patterns.</p> <p>Future knowledge: This unit progresses students' knowledge through listening to music and considering how music can affect how we think and feel. Learners will then purposefully create rhythm patterns and music.</p>	<p>Prior knowledge: Learners should have some familiarity with Scratch Jnr. from the corresponding programming unit in year 1.</p> <p>Future knowledge: This unit progresses learners' knowledge and understanding of instructions in sequences and the use of logical reasoning to predict outcomes.</p>

Specific Vocabulary	Data, Tally Chart, Pictogram, Attribute		Notes, Rhythm, Melody, Tempo, Digital		Programme, Algorithm, Debug, Character, Background		
		IT Around Us	Digital Photography	Robot Algorithms	Pictograms	Making Music	An introduction to quizzes
Knowledge Progression	1	To recognise the uses and features of information technology	To use a digital device to take a photograph	To describe a series of instructions as a sequence	To recognise that we can count and compare objects using tally charts	To say how music can make us feel	To explain that a sequence of commands has a start
	2	To identify the uses of information technology in the school	To make choices when taking a photograph	To explain what happens when we change the order of instructions	To recognise that objects can be represented as pictures	To identify that there are patterns in music	To explain that a sequence of commands has an outcome
	3	To identify information technology beyond school	To describe what makes a good photograph	To use logical reasoning to predict the outcome of a program (series of commands)	To create a pictogram	To show how music is made from a series of notes	To create a program using a given design
	4	To explain how information technology helps us	To decide how photographs can be improved	To explain that programming projects can have code and artwork	To select objects by attribute and make comparisons	To show how music is made from a series of notes	To change a given design
	5	To explain how to use information technology safely	To use tools to change an image	To design an algorithm	To recognise that people can be described by attributes	To create music for a purpose	To create a program using my own design




COMPUTING CURRICULUM




Progression of Skills & Knowledge






	6	To recognise that choices are made when using information technology	To recognise that photos can be changed	To create and debug a program that I have written	To explain that we can present information using a computer	To review and refine our computer work	To decide how my project can be improved
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YEAR THREE

Unit	Connecting Computers							Animation							Sequencing in Music						
NC	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7
Thread	 Computing Systems and Networks							 Creating Media							 Programming						
Overview	<p>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.</p>							<p>Learners will use a range of techniques to create a stop-frame animation using tablets. 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.</p>							<p>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</p>						
Key questions	<ul style="list-style-type: none"> • How does a digital device work? • What parts make up a digital device? • How do digital devices help us? • How am I connected? • How are computers connected? • What does our school network look like? 							<ul style="list-style-type: none"> • What is an 'animation?' • Can a picture move? • What is stop-frame animation? • How can I improve my video? 							<ul style="list-style-type: none"> • How can algorithms create commands? • How can commands be sequenced together? • What happens when notes are combined to form a chord? 						
Knowledge	<p>Prior knowledge: This unit progresses learners' knowledge and understanding of technology by focusing on digital and non-digital devices, and introducing the concept of computers connected together as a network</p> <p>Future knowledge: Following this unit, learners will explore the internet as a network of networks.</p>							<p>Prior knowledge: This unit progresses students' knowledge and understanding of using digital devices to create media, exploring how they can create stop-frame animations.</p> <p>Future knowledge: Following this unit, learners will further develop their video editing skills in Year 5.</p>							<p>Prior knowledge: This unit assumes that learners will have some prior experience of programming; the KS1 NCCE units cover floor robots and ScratchJr.</p> <p>Future knowledge:</p>						




Specific Vocabulary	Input, Output, Network, Server, Process	Animation, Flip Book, Stop-Frame, Onion Skinning,	Sprite, Backdrop, Code, Sequence, Algorithm, Note, Chord																		
Unit	Branching Databases							Desktop Publishing							Events and Actions						
NC	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7
Thread	 Data and Information							 Creating Media							 Programming						
Overview	<p>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.</p>							<p>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.</p>							<p>This unit explores the links between events and actions, while consolidating prior learning relating to sequencing. Learners begin by moving a sprite in four directions (up, down, left, and right). They then explore movement within the context of a maze, using design to choose an appropriately sized sprite. 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.</p>						
Key questions	<ul style="list-style-type: none"> • What is a branching database? • How can attributes be used to sort and group objects? • How are branching-databases used in the world around us? 							<ul style="list-style-type: none"> • What are the advantages of using text and imagery to communicate? • Why have you chosen a font, size or colour? • How can information be set out on a page? What is desktop publishing? 							<ul style="list-style-type: none"> • What commands can we give to our 'sprite'? • How can we sequence commands to create an algorithm? • How can I debug and evaluate my project? 						
Knowledge	<p>Prior knowledge: This unit progresses learners' knowledge and understanding of the categories of data handling, with a particular focus on implementation. It builds on their knowledge of data and information from key stage 1.</p> <p>Future knowledge: Learners will continue to develop their understanding of attributes and begin to construct and interrogate branching databases as a means of displaying and retrieving information.</p>							<p>Prior knowledge: This unit progresses learners' knowledge and understanding of using digital devices to combine text and images building on work from the following units; Digital Writing Year 1, Digital painting Year 1, and Digital Photography Year 2.</p> <p>Future knowledge:</p>							<p>Prior knowledge: This unit assumes that learners will have some prior experience of programming. The key stage 1 National Centre for Computing Education units focus on floor robots and ScratchJr. The Year 3 — Programming A unit introduces the Scratch programming environment and the concept of sequences.</p> <p>Future knowledge:</p>						




Specific Vocabulary	Attribute, Value, Table, Object Database, Branching Database		Text, Images, Templates, Orientation, Placeholders			Motion, Event, Sprite, Logic, Resize, Algorithm	
		Connecting Computers	Animation	Sequencing in Music	Branching Databases	Desktop Publishing	Events and Actions
Knowledge Progression	1	To explain how digital devices function	To explain that animation is a sequence of drawings or photographs	To explore a new programming environment	To create questions with yes/no answers	To recognise how text and images convey information	To explain how a sprite moves in an existing project
	2	To identify input and output devices	To relate animated movement with a sequence of images	To identify that commands have an outcome	To identify the object attributes needed to collect relevant data	To recognise that text and layout can be edited	To create a program to move a sprite in four directions
	3	To recognise how digital devices can change the way we work	To plan an animation	To explain that a program has a start	To create a branching database	To choose appropriate page settings	To adapt a program to a new context
	4	To explain how a computer network can be used to share information	To identify the need to work consistently and carefully	To recognise that a sequence of commands can have an order	To explain why it is helpful for a database to be well structured	To add content to a desktop publishing publication	To develop my program by adding features
	5	To explore how digital devices can be connected	To review and improve an animation	To change the appearance of my project	To identify objects using a branching database	To consider how different layouts can suit different purposes	To identify and fix bugs in a program
	6	To recognise the physical components of a network	To evaluate the impact of adding other media to an animation	To create a project from a task description	To compare the information shown in a pictogram with a branching database	To consider the benefits of desktop publishing	To design and create a maze-based challenge

YEAR FOUR																					
Unit	The Internet							Audio Editing							Repetition in Shapes						
NC	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7
Thread	 Computing Systems and Networks							 Creating Media							 Programming						
Overview	<p>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.</p>							<p>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.</p>							<p>Learners will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language.</p>						
Key questions	<ul style="list-style-type: none"> • What is the internet? • Who owns the 'web'? • Can I believe everything I read? 							<ul style="list-style-type: none"> • How can we record sound and edit recording? • What is a podcast? • How can I edit and improve my podcast? 							<ul style="list-style-type: none"> • How does an algorithm give commands to computer programme? • What steps can we take to debug an algorithm? • How can loops create shapes? • Why does decomposition create a more effective algorithm? 						
Knowledge	<p>Prior knowledge: This unit progresses students' knowledge and understanding of networks in Year 3.</p> <p>Future knowledge: In Year 5, they will continue to develop their knowledge and understanding of computing systems and online collaborative working.</p>							<p>Prior knowledge: This unit progresses students' knowledge and understanding of creating media, by focusing on the recording and editing of sound to produce a podcast</p> <p>Future knowledge: Following this unit, learners will explore combining audio with video in the 'Video editing' unit in Year 5.</p>							<p>Prior knowledge: This unit progresses students' knowledge and understanding of programming. It progresses from the sequence of commands in a program to using count-controlled loops.</p> <p>Future knowledge: Pupils will create algorithms and then implement those algorithms as code.</p>						
Specific Vocabulary	Internet, Router, Network, Internet Security, Switch, Website, Browser														Programme, Commands, Code, Snippet, Algorithm, Debug, Count-controlled Loop, Procedures						

Unit	Data Logging							Photo Editing							Repetition in Games						
NC	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7
Thread	 Data and Information							 Creating Media							 Programming						
Overview	<p>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.</p>							<p>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.</p>							<p>Learners will explore the concept of repetition in programming using the Scratch environment. The unit begins with a Scratch activity similar to that carried out in Logo in Programming unit A, 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.</p>						
Key questions	<ul style="list-style-type: none"> In what ways is data collected in the real world? How can computers effectively collect and present data? What questions could we answer using a data logging tool? 							<ul style="list-style-type: none"> How can I use effects, such as resizing, colouring and rotating to improve my image? How can I resave and reuse an image I have edited? How can I tell if an image is real? 							<ul style="list-style-type: none"> What effect does a modification to a snippet code have on an outcome? What are the effects of a count-controlled and infinite loop? How can snippet codes be reused on new sprites? How effective was my design? 						
Knowledge	<p>Prior knowledge: This unit progresses learners' knowledge and understanding of data and how it can be collected over time to answer questions. It builds on the concept of answering questions with data which is first introduced in the KS1 data and information units.</p> <p>Future knowledge: Learners are also introduced to data in tables and graphs, knowledge they will build on in the Year 5 unit (flat file databases) and the Year 6 unit (spreadsheets).</p>							<p>Prior knowledge: This unit progresses students' knowledge and understanding of digital photography and using digital devices to create media.</p> <p>Future knowledge: Following this unit, learners will further develop their image editing skills in Year 5 – Vector drawing.</p>							<p>Prior knowledge: This unit assumes that learners will have some prior experience of programming. The KS1 NCCE units cover floor robots and Scratch Jr, and Scratch is introduced in the Year 3 programming units.</p> <p>Future knowledge:</p>						

Specific Vocabulary	Data, Table, Layout, Logging, Data Point		Image, edit, digital, crop, rotate, undo, save, background, foreground, composite		Scratch, Sprite, Blocks, Code, loop, Repeat, Value, Infinite loop, Count-controlled loop, Animate, Costume, Duplicate		
		The Internet	Audio Editing	Repetition in Shapes	Data Logging	Photo Editing	Repetition in Games
Knowledge Progression	1	To describe how networks physically connect to other networks	To identify that sound can be digitally recorded	To identify that accuracy in programming is important	To explain that data gathered over time can be used to answer questions	To explain that digital images can be changed	To develop the use of count-controlled loops in a different programming environment
	2	To recognise how networked devices make up the internet	To use a digital device to record sound	To create a program in a text-based language	To use a digital device to collect data automatically	To change the composition of an image	To explain that in programming there are infinite loops and count controlled loops
	3	To outline how websites can be shared via the World Wide Web (WWW)	To explain that a digital recording is stored as a file	To explain what 'repeat' means	To explain that a data logger collects 'data points' from sensors over time	To describe how images can be changed for different uses	To develop a design that includes two or more loops which run at the same time
	4	To describe how content can be added and accessed on the World Wide Web (WWW)	To explain that audio can be changed through editing	To modify a count-controlled loop to produce a given outcome	To use data collected over a long duration to find information	To make good choices when selecting different tools	To modify an infinite loop in a given program
	5	To recognise how the content of the WWW is created by people	To show that different types of audio can be combined and played together	To decompose a task into small steps	To identify the data needed to answer questions	To recognise that not all images are real	To design a project that includes repetition




	6	To evaluate the consequences of unreliable content	To evaluate editing choices made	To create a program that uses count-controlled loops to produce a given outcome	To use collected data to answer questions	To evaluate how changes can improve an image	To create a project that includes repetition														
YEAR FOUR																					
Unit	The Internet							Audio Editing							Repetition in Shapes						
NC	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7
Thread	 Computing Systems and Networks							 Creating Media							 Programming						
Overview	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.							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.							Learners will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language.						
Key questions	<ul style="list-style-type: none"> • What is the internet? • Who owns the 'web'? • Can I believe everything I read? 							<ul style="list-style-type: none"> • How can we record sound and edit recording? • What is a podcast? • How can I edit and improve my podcast? 							<ul style="list-style-type: none"> • How does an algorithm give commands to computer programme? • What steps can we take to debug an algorithm? • How can loops created shapes? • Why does decomposition create a more effective algorithm? 						
Knowledge	<p>Prior knowledge: This unit progresses students' knowledge and understanding of networks in Year 3.</p> <p>Future knowledge: In Year 5, they will continue to develop their knowledge and understanding of computing systems and online collaborative working.</p>							<p>Prior knowledge: This unit progresses students' knowledge and understanding of creating media, by focusing on the recording and editing of sound to produce a podcast</p> <p>Future knowledge</p>							<p>Prior knowledge: This unit progresses students' knowledge and understanding of programming. It progresses from the sequence of commands in a program to using count-controlled loops.</p> <p>Future knowledge: Pupils will create algorithms and then implement those algorithms as code.</p>						




		Following this unit, learners will explore combining audio with video in the 'Video editing' unit in Year 5.																			
Specific Vocabulary	Internet, Router, Network, Internet Security, Switch, Website, Browser							Audio, microphone, speaker, input device, output device, layer, import, export, MP3							Programme, Commands, Code, Snippet, Algorithm, Debug, Count-controlled Loop, Procedures						
Unit	Data Logging							Photo Editing							Repetition in Games						
NC	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7
Thread	 Data and Information							 Creating Media							 Programming						
Overview	<p>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.</p>							<p>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.</p>							<p>Learners will explore the concept of repetition in programming using the Scratch environment. The unit begins with a Scratch activity similar to that carried out in Logo in Programming unit A, 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.</p>						
Key questions	<ul style="list-style-type: none"> In what ways is data collected in the real world? How can computers effectively collect and present data? What questions could we answer using a data logging tool? 							<ul style="list-style-type: none"> How can I use effects, such as resizing, colouring and rotating to improve my image? How can I resave and reuse an image I have edited? How can I tell if an image is real? 							<ul style="list-style-type: none"> What effect does a modification to a snippet code have on an outcome? What are the effects of a count-controlled and infinite loop? How can snippet codes be reused on new sprites? How effective was my design? 						
Knowledge	<p>Prior knowledge: This unit progresses learners' knowledge and understanding of data and how it can be collected over time to answer questions. It builds on the concept of answering questions with data which is first introduced in the KS1 data and information units.</p> <p>Future knowledge:</p>							<p>Prior knowledge: This unit progresses students' knowledge and understanding of digital photography and using digital devices to create media.</p> <p>Future knowledge:</p>							<p>Prior knowledge: This unit assumes that learners will have some prior experience of programming. The KS1 NCCE units cover floor robots and Scratch Jr, and Scratch is introduced in the Year 3 programming units.</p> <p>Future knowledge:</p>						

	Learners are also introduced to data in tables and graphs, knowledge they will build on in the Year 5 unit (flat file databases) and the Year 6 unit (spreadsheets).		Following this unit, learners will further develop their image editing skills in Year 5 – Vector drawing.				
Specific Vocabulary	Data, Table, Layout, Logging, Data Point		Image, edit, digital, crop, rotate, undo, save, background, foreground, composite		Scratch, Sprite, Blocks, Code, loop, Repeat, Value, Infinite loop, Count-controlled loop, Animate, Costume, Duplicate		
		The Internet	Audio Editing	Repetition in Shapes	Data Logging	Photo Editing	Repetition in Games
Knowledge Progression	1	To describe how networks physically connect to other networks	To identify that sound can be digitally recorded	To identify that accuracy in programming is important	To explain that data gathered over time can be used to answer questions	To explain that digital images can be changed	To develop the use of count-controlled loops in a different programming environment
	2	To recognise how networked devices make up the internet	To use a digital device to record sound	To create a program in a text-based language	To use a digital device to collect data automatically	To change the composition of an image	To explain that in programming there are infinite loops and count controlled loops
	3	To outline how websites can be shared via the World Wide Web (WWW)	To explain that a digital recording is stored as a file	To explain what 'repeat' means	To explain that a data logger collects 'data points' from sensors over time	To describe how images can be changed for different uses	To develop a design that includes two or more loops which run at the same time
	4	To describe how content can be added and accessed on the World Wide Web (WWW)	To explain that audio can be changed through editing	To modify a count-controlled loop to produce a given outcome	To use data collected over a long duration to find information	To make good choices when selecting different tools	To modify an infinite loop in a given program
	5	To recognise how the content of the	To show that different types of audio can be	To decompose a task into small steps	To identify the data needed to answer questions	To recognise that not all images are real	To design a project that includes repetition

		WWW is created by people	combined and played together				
	6	To evaluate the consequences of unreliable content	To evaluate editing choices made	To create a program that uses count-controlled loops to produce a given outcome	To use collected data to answer questions	To evaluate how changes can improve an image	To create a project that includes repetition

YEAR FIVE

Unit	Sharing Information							Video Editing							Selection in Physical Computing						
NC	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7
Thread	 Computing Systems and Networks							 Creating Media							 Programming						
Overview	<p>In this unit, learners will develop their understanding of computer systems and how information is transferred between systems and devices. Learners will consider small-scale systems as well as large-scale systems. They will explain the input, output, and process aspects of a variety of different real-world systems. Learners will also take part in a collaborative online project with other class members.</p>							<p>In this unit, learners will develop their understanding of computer systems and how information is transferred between systems and devices. Learners will consider small-scale systems as well as large-scale systems. They will explain the input, output, and process aspects of a variety of different real-world systems. Learners are guided with step-by-step support to take their idea from conception to completion.</p>							<p>In this unit, learners will use physical computing to explore the concept of selection in programming. Learners will be introduced to a microcontroller and learn how to connect and program components. 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.</p>						
Key questions	<ul style="list-style-type: none"> • What are computer systems? What systems exist around us? • How can we search the web? • How are search results ranked? • How are searches influenced? 							<ul style="list-style-type: none"> • What is video? • How do different filming techniques affect the outcome of the video? • Why is a storyboard important when planning a video? • How can a video be edited? 							<ul style="list-style-type: none"> • What is a microcontroller? • How can I set control conditions? • How are algorithms and programs affected by control conditions? 						
Knowledge	<p>Prior knowledge: This unit progresses learners' knowledge and understanding of computing systems.</p> <p>Future knowledge:</p>							<p>Prior knowledge: The unit builds on the Year 4 unit 'Photo editing' where composition is introduced and the Year 3 unit 'Stop-frame animation' where learners explored some of the features of video production</p> <p>Future knowledge:</p>							<p>Prior knowledge: This unit assumes that learners will have prior experience of programming using a block-based language (eg Scratch) and understand the concepts of sequence and repetition. The National Centre for Computing Education key stage 1 units focus on floor robots and Scratch Jr</p> <p>Future knowledge:</p>						

		By the end of this unit, learners will have developed the skills required to plan, record, edit, and share a video.	
Specific Vocabulary	System, connection, digital, input, process, output, search, search engine, refine, web crawler, content creator, selection, ranking	Video, audio, camera, talking head, panning, close up, static camera, zoom, pan, tilt, storyboard, delete, trim, reorder, export, evaluate, share	Microcontroller, infinite-loop, count-controlled loop, condition, algorithm, selections
Unit	Flat-File Databases	Vector Drawing	Selection in Quizzes
NC	2.1 2.2 2.3 2.4 2.5 2.6 2.7	2.1 2.2 2.3 2.4 2.5 2.6 2.7	2.1 2.2 2.3 2.4 2.5 2.6 2.7
Thread	 Data and Information	 Creating Media	 Programming
Overview	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 will develop their understanding of computer systems and how information is transferred between systems and devices. Learners will consider small-scale systems as well as large-scale systems. They will explain the input, output, and process aspects of a variety of different real-world systems.	Learners will develop their knowledge of 'selection' by revisiting how 'conditions' can be used in programming, 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 in the Scratch programming environment. They learn how to write programs that ask questions and use selection to control the outcomes based on the answers given. They use this knowledge to design a quiz in response to a given task and implement it as a program.
Key questions	<ul style="list-style-type: none"> • What is a database? • What is the difference between a flat file database and computer database? • How are databases used in real life? • Why do we need search by different fields? 	<ul style="list-style-type: none"> • What are vectors? • How can vectors be used in drawing? • How can layers and objects be used for effect in vector drawing? 	<ul style="list-style-type: none"> • How to do conditions control the flow of actions in a program? • Why is it important to test a programme after it has been created? • How can my programme be improved?
Knowledge	Prior knowledge:	Prior knowledge: This unit progresses learners' knowledge and understanding of digital painting and has some	Prior knowledge: This unit assumes that learners will have prior experience of programming using block-based




	<p>This unit progresses learners' knowledge and understanding of why and how information might be stored in a database.</p> <p>Future knowledge: It moves on to demonstrate how a database can help us display data visually, and how real-life databases can be used to help us solve problems</p>	<p>links to the Year 3 'Creating media – Desktop publishing' unit, in which learners used digital images</p> <p>Future knowledge:</p>	<p>construction (e.g. Scratch), understand the concepts of 'sequence' and 'repetition', and have some experience of using 'selection'.</p> <p>Future knowledge:</p>				
Specific Vocabulary	<p>Database, data, information, record, field, sort, order, group, graph, chart, presentation</p>	<p>Vector, Object, resize, rotate, layer, forwards, backwards</p>	<p>Selection, condition, action, block, repetition, condition, outcome</p>				
		Sharing Information	Video Editing	Selection in Physical Computing	Flat-File Databases	Vector Drawing	Selection in Quizzes
Knowledge Progression	1	To explain that computers can be connected together to form systems	To explain what makes a video effective	To control a simple circuit connected to a computer	To use a form to record information	To identify that drawing tools can be used to produce different outcomes	To explain how selection is used in computer programs
	2	To recognise the role of computer systems in our lives	To identify digital devices that can record video	To write a program that includes count-controlled loops	To compare paper and computer-based databases	To create a vector drawing by combining shapes	To relate that a conditional statement connects a condition to an outcome
	3	To recognise how information is transferred over the internet	To capture video using a range of techniques	To explain that a loop can stop when a condition is met	To outline how grouping and then sorting data allows us to answer questions	To use tools to achieve a desired effect	To explain how selection directs the flow of a program
	4	To explain how sharing information online lets people in different places work together	To create a storyboard	To explain that a loop can be used to repeatedly check whether a	To explain that tools can be used to select specific data	To recognise that vector drawings consist of layers	To design a program which uses selection




COMPUTING CURRICULUM

Progression of Skills & Knowledge



				condition has been met			
	5	To contribute to a shared project online	To identify that video can be improved through reshooting and editing	To design a physical project that includes selection	To explain that computer programs can be used to compare data visually	To group objects to make them easier to work with	To create a program which uses selection
	6	To evaluate different ways of working together online	To consider the impact of the choices made when making and sharing a video	To create a program that controls a physical computing project	To apply my knowledge of a database to ask and answer real-world question.	To evaluate my vector drawing	To evaluate my program

YEAR SIX																					
Unit	Communication							Web Page Creation							Variables in Games						
NC	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7
Thread	 Computing Systems and Networks							 Creating Media							 Programming						
Overview	<p>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. Finally, they learn how to communicate responsibly by considering what should and should not be shared on the internet.</p>							<p>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.</p>							<p>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. Learners then experiment with variables in an existing project, then modify them, before they create their own project. Finally learners apply their knowledge of variables and design to improve their games in Scratch.</p>						
Key questions	<ul style="list-style-type: none"> • How do computers communicate with other devices? • What are data packets? • Which methods of internet-based communication most effective? 							<ul style="list-style-type: none"> • What is a webpage? • What makes a good website? • What is 'copyright?' Why is it important in building a website? • How can webpages be linked by using hyperlinks? 							<ul style="list-style-type: none"> • What are variables? • Why is it important to name variables in programmes? • How can I improve my project? 						
Knowledge	<p>Prior knowledge: This unit progresses learners' knowledge and understanding of computing systems and online collaborative working.</p> <p>Future knowledge:</p>							<p>Prior knowledge: This unit progresses students' knowledge and understanding of the following: digital writing, digital painting, desktop publishing, digital photography, photo editing, and vector drawing.</p> <p>Future knowledge:</p>							<p>Prior knowledge: This unit assumes that learners have some prior experience of programming in Scratch. Specifically, they should be familiar with the programming constructs of sequence, repetition, and selection.</p> <p>Future knowledge:</p>						
Specific Vocabulary	<p>Communication, protocol, data, address, Internet Protocol (IP) address, Domain Name Server (DNS), packet, header, data payload, public, private, one-way, two-way, one-to-one, one-to-many</p>							<p>Website, web page, browser, media, Hypertext Markup Language (HTML), copyright, fair use, breadcrumb trail, navigation, hyperlink, subpage</p>							<p>Variable, change, name, value, set, change, design, algorithm, code</p>						

Unit	Spreadsheets							3-D Modelling							Sensing						
NC	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7
Thread	 Data and Information							 Creating Media							 Programming						
Overview	<p>This unit introduces the learners to spreadsheets. 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.</p>							<p>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.</p>							<p>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. 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.</p>						
Key questions	<ul style="list-style-type: none"> • What is a spreadsheet? How are they used? • How does a formula affect the value of a cell? • How can data in spreadsheets be presented in different ways? 							<ul style="list-style-type: none"> • What is 3-D modelling? • Why is design and planning important? • How can designs be modified and evaluated? 							<ul style="list-style-type: none"> • What is a micro:bit? How can it be used as an input/ output device? • Why does a variable need a name and value? • Why is it important to set up a variable at the start of a programme? 						
Knowledge	<p>Prior knowledge: Learners will have experienced data in tables and charts in the Y4 data logging and Y5 branching database units.</p> <p>Future knowledge: This unit progresses students' knowledge and understanding of data, and teaches them how to organise and modify data within spreadsheets</p>							<p>Prior knowledge: Prior to undertaking this unit, learners should have worked with 2D graphics applications.</p> <p>Future knowledge: This unit progresses students' knowledge and understanding of creating 3D graphics using a computer.</p>							<p>Prior knowledge: This unit presumes that pupils are already confident in their understanding of sequence, repetition and selection independently within programming.</p> <p>Future knowledge:</p>						
Specific Vocabulary	Data, collecting, table, structure, spreadsheet, Formula, calculation, data, spreadsheet, input, output, cells, cell reference							2D, 3D, shapes, select, move, perspective, view, rotate, duplicate, group, construct, evaluate, modify							Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, variable, sensing, accelerometer, value, code, test, debug						

		Communication	Web Page Creation	Variables in Games	Spreadsheets	3-D Modelling	Sensing
Knowledge Progression	1	To identify how to use a search engine	To review an existing website and consider its structure	To define a 'variable' as something that is changeable	To identify questions which can be answered using data	To use a computer to create and manipulate three-dimensional (3D) digital objects	To create a program to run on a controllable device
	2	To describe how search engines select results	To plan the features of a web page	To explain why a variable is used in a program	To explain that objects can be described using data	To compare working digitally with 2D and 3D graphics	To explain that selection can control the flow of a program
	3	To explain how search results are ranked	To consider the ownership and use of images (copyright)	To choose how to improve a game by using variables	To explain that formulas can be used to produce calculated data	To construct a digital 3D model of a physical object	To update a variable with a user input
	4	To recognise why the order of results is important, and to whom	To recognise the need to preview pages	To design a project that builds on a given example	To apply formulas to data, including duplicating	To identify that physical objects can be broken down into a collection of 3D shapes	To use an conditional statement to compare a variable to a value
	5	To recognise how we communicate using technology	To outline the need for a navigation path	To use my design to create a project	To create a spreadsheet to plan an event	To design a digital model by combining 3D objects	To design a project that uses inputs and outputs on a controllable device
	6	To evaluate different methods of online communication	To recognise the implications of linking to content owned by other people	To evaluate my project	To choose suitable ways to present data	To develop and improve a digital 3D model	To develop a program to use inputs and outputs on a controllable device

National Curriculum Objectives for Computing:

Key stage 1 Pupils should be taught to:

- 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
- 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.

Key stage 2 Pupils should be taught to:

- 2.1.** design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- 2.2** use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- 2.3** use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- 2.4** 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
- 2.5** use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- 2.6** 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
- 2.7** use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.