



Phase	Cycle	Autumn		Spring		Summer	
KS1	A	Information technology around us	Digital photography	Robot algorithms	Pictograms	Making music	Programming quizzes
	B	Technology all around us	Digital painting	Moving a robot	Grouping data	Digital writing	Programme animation
LKS2 Yr 3/4	A	The internet	Audio editing	Repetition in shapes	Data logging	Photo editing	Repetition in games
	B	Connecting computers	Stop-frame animation	Sequencing sounds	Branching databases	Desktop publishing	Events and actions in programmes
UKS2 Yr 5/6	A	Internet communication	Webpage creation	Variable in games	Introduction to spreadsheets	3d modelling	Sensing
	B	Sharing information	Video editing	Selection in physical computing	Flat-file databases	Vector drawing	Selection in quizzes

# Christopher Rawlins CE Primary School

## Computing Curriculum Objectives by Term

Scheme: Teach Computing



Phase	Cycle	Autumn		Spring		Summer	
KS1	A	<p>use technology purposefully to create, organise, store, manipulate and retrieve digital content</p> <p>recognise common uses of information technology beyond school</p> <p>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.</p>	<p>use technology purposefully to create, organise, store, manipulate and retrieve digital content</p> <p>recognise common uses of information technology beyond school</p> <p>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.</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</p> <p>create and debug simple programs</p> <p>use logical reasoning to predict the behaviour of simple programs</p> <p>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.</p>	<p>use technology purposefully to create, organise, store, manipulate and retrieve digital content</p> <p>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.</p>	<p>use technology purposefully to create, organise, store, manipulate and retrieve digital content</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</p> <p>create and debug simple programs</p> <p>use logical reasoning to predict the behaviour of simple programs</p> <p>use technology purposefully to create, organise, store, manipulate and retrieve digital content</p>	
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<p><b>LKS2</b> <b>Yr 3/4</b></p>	<p><b>A</b></p>	<p>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</p> <p>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p>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</p> <p>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p>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</p> <p>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</p> <p>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p> <p>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p> <p>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</p>	<p>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p> <p>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</p>	<p>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p>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</p> <p>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</p> <p>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p> <p>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p> <p>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</p>
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		<p>for communication and collaboration</p> <p>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.</p> <p>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>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.</p> <p>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>problems by decomposing them into smaller parts</p> <p>use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</p> <p>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p> <p>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</p>	<p>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</p>	<p>systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</p>	<p>problems by decomposing them into smaller parts</p> <p>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p> <p>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p> <p>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</p>
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	By the end of KS1	By the end of LKS2	By the end of UKS2
Computing systems and networks	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>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 and how to report concerns about inappropriate content online.</li> </ul>
Creating media	<ul style="list-style-type: none"> <li>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.</li> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Learners will learn how to create short videos by working in pairs or 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. Learners are guided with step-by-step support to take their idea from conception to completion. At the conclusion of the unit, learners have the opportunity to reflect on and assess their progress in creating a video.</li> </ul>

	<p>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.</p> <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>	<p>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> <ul style="list-style-type: none"> <li>Learners will become familiar with the term's '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.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Learners will be introduced to creating 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.</li> <li>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.</li> <li>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.</li> </ul>
<p><b>Programming</b></p>	<ul style="list-style-type: none"> <li>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. Learners are also introduced to the early stages of program design through the introduction of algorithms.</li> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>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. Learners also apply stages of program design through this unit.</li> <li>Learners will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language.</li> <li>This unit explores the links between events and actions, while consolidating prior learning relating to sequencing.</li> </ul>	<ul style="list-style-type: none"> <li>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 it to control components (including output devices — LEDs and motors). Learners will be introduced to conditions as a means of controlling the flow of actions in a program. Learners will make use of their knowledge of repetition and conditions when introduced to the concept of selection (through the 'if...then...' structure) and write algorithms and programs that utilise this concept. To conclude the unit, learners will design and make a working model of a fairground carousel that will demonstrate their understanding of how the microcontroller and its components are connected, and how selection can be used to control the operation of the model. Throughout</li> </ul>

	<p>stages of program design through the introduction of algorithms.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> </ul>	<p>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. The unit concludes with learners designing and coding their own maze-tracing program.</p> <ul style="list-style-type: none"> <li>• 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.</li> </ul>	<p>this unit, learners will apply the stages of programming design.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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. To conclude the unit, learners evaluate their program by identifying how it meets the requirements of the task, the ways they have improved it, and further ways it could be improved.</li> <li>• 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.</li> </ul>
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			<ul style="list-style-type: none"> <li>Design features prominently in this unit. A design template is introduced in Lesson 3, initially scaffolded to give pupils the opportunity to create code from a given design. In Lesson 4 that scaffolding is gradually reduced, then in Lesson 5, pupils create their own design, using the same template. In the final lesson, pupils will apply their knowledge of the programming constructs and use their design to create their own micro:bit-based step counter</li> </ul>
<p><b>Data &amp; Information</b></p>	<ul style="list-style-type: none"> <li>This unit introduces learners to data and information. Labelling, 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</li> <li>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 visually using software. Learners will use the data presented to answer questions.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>In this unit, learners will consider how and why data is collected over time. Learners 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. Learners 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. Learners will spend time using a computer to review and analyse data. Towards the end of the unit, learners will pose questions and then use data loggers to automatically collect the data needed to answer those questions</li> </ul>	<ul style="list-style-type: none"> <li>This unit looks at how a flat-file database can be used to organise data in records. Learners will use tools within a database to order and answer questions about data. They will create graphs and charts from their data to help solve problems. They will also use a real-life database to answer a question and present their work to others.</li> <li>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.</li> </ul>

## Year 1 - Information technology around us

	Prior Learning	New Learning (Year1)	Future Learning
<b>National Curriculum Objectives</b>	NA	<ul style="list-style-type: none"> <li>● use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>● recognise common uses of information technology beyond school</li> <li>● 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.</li> </ul>	<ul style="list-style-type: none"> <li>● use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>● recognise common uses of information technology beyond school</li> <li>● 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.</li> </ul>
<b>Key Ideas</b>	NA	<ul style="list-style-type: none"> <li>● I can explain how these technology examples help us</li> <li>● I can explain technology as something that helps us</li> <li>● I can locate examples of technology in the classroom"</li> <li>● I can name the main parts of a computer</li> <li>● I can switch on and log into a computer</li> <li>● I can use a mouse to click and drag"</li> <li>● I can click and drag to make objects on a screen</li> <li>● I can use a mouse to create a picture</li> <li>● I can use a mouse to open a program"</li> <li>● I can save my work to a file</li> <li>● I can say what a keyboard is for</li> <li>● I can type my name on a computer"</li> <li>● I can delete letters</li> <li>● I can open my work from a file</li> <li>● I can use the arrow keys to move the cursor"</li> <li>● I can discuss how we benefit from these rules</li> <li>● I can give examples of some of these rules</li> <li>● I can identify rules to keep us safe and healthy when we are using technology in and beyond the home</li> </ul>	<ul style="list-style-type: none"> <li>● "-I can describe some uses of computers</li> <li>● - I can identify examples of computers</li> <li>● - I can identify that a computer is a part of IT"</li> <li>● "-I can identify examples of IT</li> <li>● - I can identify that some IT can be used in more than one way</li> <li>● - I can sort school IT by what it's used for"</li> <li>● "-I can find examples of information technology</li> <li>● - I can sort IT by where it is found</li> <li>● - I can talk about uses of information technology"</li> <li>● "-I can demonstrate how IT devices work together</li> <li>● - I can recognise common types of technology</li> <li>● - I can say why we use IT"</li> <li>● "-I can list different uses of information technology</li> <li>● - I can say how rules can help keep me safe</li> <li>● - I can talk about different rules for using IT"</li> <li>● "-I can explain the need to use IT in different ways</li> <li>● - I can identify the choices that I make when using IT</li> <li>● - I can use IT for different types of activities"</li> </ul>
<b>Key Questions</b>	NA	<ul style="list-style-type: none"> <li>● <b>Can you identify technology around us?</b></li> <li>● <b>Can you identify the main parts of a computer</b></li> <li>● <b>What is the purpose of a mouse?</b></li> <li>● <b>What is the purpose of a keyboard?</b></li> <li>● <b>How can you edit text using a keyboard?</b></li> <li>● <b>What 3 rules can you follow when using technology responsibly?</b></li> </ul>	<ul style="list-style-type: none"> <li>● <b>What uses does a computer have?</b></li> <li>● <b>Where are examples of IT in our school?</b></li> <li>● <b>Where are examples of IT beyond our school?</b></li> <li>● <b>Why do we use IT?</b></li> <li>● <b>What rules could keep you safe when using IT?</b></li> <li>● <b>How can I use IT in different ways?</b></li> </ul>
<b>Vocabulary</b>	NA	technology, computer, mouse, trackpad, keyboard, screen, double-click, typing.	Information technology (IT), computer, barcode, scanner/scan

## Year 1- Creating media (Digital painting)

	Prior Learning	New Learning (Year1)	Future Learning
<b>National Curriculum Objectives</b>	NA	<ul style="list-style-type: none"> <li>● use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> </ul>	<ul style="list-style-type: none"> <li>● use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>● recognise common uses of information technology beyond school</li> <li>● 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.</li> </ul>
<b>Key Ideas</b>	NA	<ul style="list-style-type: none"> <li>● "- I can draw lines on a screen and explain which tools I used</li> <li>● - I can make marks on a screen and explain which tools I used</li> <li>● - I can use the paint tools to draw a picture"</li> <li>● "- I can make marks with the square and line tools</li> <li>● - I can use the shape and line tools effectively</li> <li>● - I can use the shape and line tools to recreate the work of an artist"</li> <li>● "- I can choose appropriate shapes</li> <li>● - I can create a picture in the style of an artist</li> <li>● - I can make appropriate colour choices"</li> <li>● "- I can choose appropriate paint tools and colours to recreate the work of an artist</li> <li>● - I can say which tools were helpful and why</li> <li>● - I know that different paint tools do different jobs"</li> <li>● "- I can change the colour and brush sizes</li> <li>● - I can make dots of colour on the page</li> <li>● - I can use dots of colour to create a picture in the style of an artist on my own"</li> <li>● "- I can explain that pictures can be made in lots of different ways</li> <li>● - I can say whether I prefer painting using a computer or using paper</li> <li>● - I can spot the differences between painting on a computer and on paper"</li> </ul>	<ul style="list-style-type: none"> <li>● "- I can explain what I did to capture a digital photo</li> <li>● - I can recognise what devices can be used to take photographs</li> <li>● - I can talk about how to take a photograph"</li> <li>● "- I can explain the process of taking a good photograph</li> <li>● - I can explain why a photo looks better in portrait or landscape format</li> <li>● - I can take photos in both landscape and portrait format"</li> <li>● "- I can discuss how to take a good photograph</li> <li>● - I can identify what is wrong with a photograph</li> <li>● - I can improve a photograph by retaking it"</li> <li>● "- I can experiment with different light sources</li> <li>● - I can explain why a picture may be unclear</li> <li>● - I can explore the effect that light has on a photo"</li> <li>● "- I can explain my choices</li> <li>● - I can recognise that images can be changed</li> <li>● - I can use a tool to achieve a desired effect"</li> <li>● "- I can apply a range of photography skills to capture a photo</li> <li>● - I can identify which photos are real and which have been changed</li> <li>● - I can recognise which photos have been changed"</li> </ul>
<b>Key Questions</b>	NA	<ul style="list-style-type: none"> <li>● <b>What is a freehand tool?</b></li> <li>● <b>What do the shape and line tools allow you to do?</b></li> <li>● <b>What choices do you need to think about when painting a digital picture?</b></li> </ul>	<ul style="list-style-type: none"> <li>● <b>What devices can be used to take a photograph?</b></li> <li>● <b>When should you take a photograph in landscape or portrait?</b></li> <li>● <b>What makes a good photograph?</b></li> <li>● <b>Why might a picture be unclear?</b></li> </ul>

		<ul style="list-style-type: none"> <li>• <b>What do you need to think about when choosing the correct tool?</b></li> <li>• <b>How can you create a digital painting?</b></li> <li>• <b>What is the difference between a digital and on paper painting?</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>How can an image be changed?</b></li> <li>• <b>Can you identify the difference between a real photograph and one that has been changed?</b></li> </ul>
<b>Vocabulary</b>	NA	paint program, tool, paintbrush, erase, fill, undo, shape tools, line tool, fill tool, undo tool, colour, brush style, brush size, pictures, painting, computers	device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, framing, lighting

## Year 1- Programming A (Moving a robot)

	Prior Learning	New Learning (Year1)	Future Learning
<b>National Curriculum Objectives</b>	NA	<ul style="list-style-type: none"> <li>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>create and debug simple programs</li> <li>use logical reasoning to predict the behaviour of simple programs</li> <li>recognise common uses of information technology beyond school</li> </ul>	<ul style="list-style-type: none"> <li>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>create and debug simple programs</li> <li>use logical reasoning to predict the behaviour of simple programs</li> <li>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.</li> </ul>
<b>Key Ideas</b>	NA	<ul style="list-style-type: none"> <li>I can match a command to an outcome</li> <li>I can predict the outcome of a command on a device</li> <li>I can run a command on a device</li> <li>I can follow an instruction</li> <li>I can give directions</li> <li>I can recall words that can be acted out</li> <li>I can compare forwards and backwards movements</li> <li>I can predict the outcome of a sequence involving forwards and backwards commands</li> <li>I can start a sequence from the same place</li> <li>I can compare left and right turns</li> <li>I can experiment with turn and move commands to move a robot</li> <li>I can predict the outcome of a sequence involving up to four commands</li> <li>I can choose the order of commands in a sequence</li> <li>I can debug my program</li> <li>I can explain what my program should do</li> <li>I can identify several possible solutions</li> <li>I can plan two programs</li> <li>I can use two different programs to get to the same place</li> </ul>	<ul style="list-style-type: none"> <li>"-I can choose a series of words that can be enacted as a sequence</li> <li>- I can follow instructions given by someone else</li> <li>- I can give clear instructions"</li> <li>" -I can show the difference in outcomes between two sequences that consist of the same commands</li> <li>- I can use an algorithm to program a sequence on a floor robot</li> <li>- I can use the same instructions to create different algorithms"</li> <li>"-I can compare my prediction to the program outcome</li> <li>- I can follow a sequence</li> <li>- I can predict the outcome of a sequence"</li> <li>"-I can explain the choices I made for my mat design</li> <li>- I can identify different routes around my mat</li> <li>- I can test my mat to make sure that it is usable"</li> <li>"-I can create an algorithm to meet my goal</li> <li>- I can explain what my algorithm should achieve</li> <li>- I can use my algorithm to create a program"</li> <li>"-I can plan algorithms for different parts of a task</li> <li>- I can put together the different parts of my program</li> <li>- I can test and debug each part of the program"</li> </ul>
<b>Key Questions</b>	NA	<ul style="list-style-type: none"> <li><b>What is a command?</b></li> <li><b>What is an instruction?</b></li> <li><b>Can you show a forward and backward movement?</b></li> <li><b>Can you show a forward, backward, left and right movement?</b></li> <li><b>Can you choose the order of commands to create a successful sequence?</b></li> <li><b>Can you identify a problem in a sequence and create a solution?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>What is a clear instruction?</b></li> <li><b>Why can there be a different outcome for 2 sequences that consist of the same commands?</b></li> <li><b>How can we predict the outcome of a program?</b></li> <li><b>Can you show 2 different routes around the mat?</b></li> <li><b>How will your algorithm meet your goal?</b></li> <li><b>What algorithms could you create for each part of a task?</b></li> </ul>

<b>Vocabulary</b>	NA	Bee-Bot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program.	instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, artwork, design, route, mat, debugging, decomposition
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## Year 1- Data and information (Grouping data)

	Prior Learning	New Learning (Year1)	Future Learning
<b>National Curriculum Objectives</b>	NA	<ul style="list-style-type: none"> <li>● use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>● 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.</li> </ul>	<ul style="list-style-type: none"> <li>● use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>● 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.</li> </ul>
<b>Key Ideas</b>	NA	<ul style="list-style-type: none"> <li>● "- I can describe objects using labels</li> <li>● - I can identify the label for a group of objects</li> <li>● - I can match objects to groups"</li> <li>● "- I can count a group of objects</li> <li>● - I can count objects</li> <li>● - I can group objects"</li> <li>● "- I can describe an object</li> <li>● - I can describe a property of an object</li> <li>● - I can find objects with similar properties"</li> <li>● "- I can count how many objects share a property</li> <li>● - I can group objects in more than one way</li> <li>● - I can group similar objects"</li> <li>● "- I can choose how to group objects</li> <li>● - I can describe groups of objects</li> <li>● - I can record how many objects are in a group"</li> <li>● "- I can compare groups of objects</li> <li>● - I can decide how to group objects to answer a question</li> <li>● - I can record and share what I have found"</li> </ul>	<ul style="list-style-type: none"> <li>● I can compare totals in a tally chart</li> <li>● - I can record data in a tally chart</li> <li>● - I can represent a tally count as a total"</li> <li>● "- I can enter data onto a computer</li> <li>● - I can use a computer to view data in a different format</li> <li>● - I can use pictograms to answer simple questions about objects"</li> <li>● "- I can explain what the pictogram shows</li> <li>● - I can organise data in a tally chart</li> <li>● - I can use a tally chart to create a pictogram"</li> <li>● "- I can answer 'more than'/'less than' and 'most/least' questions about an attribute</li> <li>● - I can create a pictogram to arrange objects by an attribute</li> <li>● - I can tally objects using a common attribute"</li> <li>● "- I can choose a suitable attribute to compare people</li> <li>● - I can collect the data I need</li> <li>● - I can create a pictogram and draw conclusions from it"</li> <li>● "- I can give simple examples of why information should not be shared</li> <li>● - I can share what I have found out using a computer</li> <li>● - I can use a computer program to present information in different ways"</li> </ul>
<b>Key Questions</b>	NA	<ul style="list-style-type: none"> <li>● <b>Can you label a variety of objects?</b></li> <li>● <b>Can you count a group of objects?</b></li> <li>● <b>Can you describe a group of objects based on their properties?</b></li> <li>● <b>Can you count how many objects share a property?</b></li> <li>● <b>Can you group a variety of objects?</b></li> <li>● <b>Can you group a variety of objects based on a question?</b></li> </ul>	<ul style="list-style-type: none"> <li>● <b>How can I record data in a tally chart?</b></li> <li>● <b>How can I record data on a computer?</b></li> <li>● <b>What is a pictogram?</b></li> <li>● <b>What is an attribute?</b></li> <li>● <b>How could you collect data for a pictogram?</b></li> <li>● <b>Why should information not be shared?</b></li> </ul>
<b>Vocabulary</b>	NA	object, label, group, search, image, property, colour, size, shape, value, data set, more, less, most, fewest, least, the same	more than, less than, most, least, common, popular, organise, data, object, tally chart, votes, total, pictogram, enter, data, compare, objects, count, explain, attribute, group, same, different, conclusion, block diagram, sharing

## Year 1- Creating media (Digital writing)

	Prior Learning	New Learning (Year1)	Future Learning
<b>National Curriculum Objectives</b>	NA	<ul style="list-style-type: none"> <li>• use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> </ul>
<b>Key Ideas</b>	NA	<ul style="list-style-type: none"> <li>• "- I can identify and find keys on a keyboard</li> <li>• - I can open a word processor</li> <li>• - I can recognise keys on a keyboard"</li> <li>• "- I can enter text into a computer</li> <li>• - I can use backspace to remove text</li> <li>• - I can use letter, number, and space keys"</li> <li>• "- I can explain what the keys that I have learnt about already do</li> <li>• - I can identify the toolbar and use bold, italic, and underline</li> <li>• - I can type capital letters"</li> <li>• "- I can change the font</li> <li>• - I can select all of the text by clicking and dragging</li> <li>• - I can select a word by double-clicking"</li> <li>• "- I can decide if my changes have improved my writing</li> <li>• - I can say what tool I used to change the text</li> <li>• - I can use 'undo' to remove changes"</li> <li>• "- I can explain the differences between typing and writing</li> <li>• - I can make changes to text on a computer</li> <li>• - I can say why I prefer typing or writing"</li> </ul>	<ul style="list-style-type: none"> <li>• I can describe music using adjectives</li> <li>• - I can identify simple differences in pieces of music</li> <li>• - I can say what I do and don't like about a piece of music"</li> <li>• "- I can create a rhythm pattern</li> <li>• - I can explain that music is created and played by humans</li> <li>• - I can play an instrument following a rhythm pattern"</li> <li>• "- I can connect images with sounds</li> <li>• - I can relate an idea to a piece of music</li> <li>• - I can use a computer to experiment with pitch"</li> <li>• "- I can explain how my music can be played in different ways</li> <li>• - I can identify that music is a sequence of notes</li> <li>• - I can refine my musical pattern on a computer"</li> <li>• "- I can add a sequence of notes to my rhythm</li> <li>• - I can create a rhythm which represents an animal I've chosen</li> <li>• - I can create my animal's rhythm on a computer"</li> <li>• "- I can explain how I changed my work</li> <li>• - I can listen to music and describe how it makes me feel</li> <li>• - I can review my work"</li> </ul>
<b>Key Questions</b>	NA	<ul style="list-style-type: none"> <li>• <b>Can you explain how I can write on a computer?</b></li> <li>• <b>Can you add and remove text on a computer?</b></li> <li>• <b>Can you identify the toolbar?</b></li> <li>• <b>Can you change the font of the text?</b></li> <li>• <b>Can you identify what tool was used to change the text?</b></li> <li>• <b>What is the difference between typing and writing?</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>What do you like and dislike about a piece of music?</b></li> <li>• <b>What is a rhythm?</b></li> <li>• <b>How can we link an idea to a piece of music?</b></li> <li>• <b>How can music be changed on a computer?</b></li> <li>• <b>How can a sequence of notes be added on a computer?</b></li> <li>• <b>What would you change in your work next time?</b></li> </ul>
<b>Vocabulary</b>	NA	word processor, keyboard, keys, letters, type, numbers, space, backspace, text cursor, capital letters, toolbar, bold, italic, underline, mouse, select, font, undo, redo, format, compare, typing, writing.	music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat, instrument, open, edit.



## Year 1- Programming B (Programming animations)

	Prior Learning	New Learning (Year1)	Future Learning
<b>National Curriculum Objectives</b>	NA	<ul style="list-style-type: none"> <li>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>create and debug simple programs</li> <li>use logical reasoning to predict the behaviour of simple programs</li> </ul>	<ul style="list-style-type: none"> <li>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>create and debug simple programs</li> <li>use logical reasoning to predict the behaviour of simple programs</li> <li>use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> </ul>
<b>Key Ideas</b>	NA	<ul style="list-style-type: none"> <li>"-I can compare different programming tools</li> <li>- I can find which commands to move a sprite</li> <li>- I can use commands to move a sprite"</li> <li>"- I can run my program</li> <li>- I can use a Start block in a program</li> <li>- I can use more than one block by joining them together"</li> <li>"- I can change the value</li> <li>- I can find blocks that have numbers</li> <li>- I can say what happens when I change a value"</li> <li>"- I can add blocks to each of my sprites</li> <li>- I can delete a sprite</li> <li>- I can show that a project can include more than one sprite"</li> <li>"-I can choose appropriate artwork for my project</li> <li>- I can create an algorithm for each sprite</li> <li>- I can decide how each sprite will move"</li> <li>"- I can add programming blocks based on my algorithm</li> <li>- I can test the programs I have created</li> <li>- I can use sprites that match my design"</li> </ul>	<ul style="list-style-type: none"> <li>I can identify that a program needs to be started</li> <li>- I can identify the start of a sequence</li> <li>- I can show how to run my program"</li> <li>"- I can change the outcome of a sequence of commands</li> <li>- I can match two sequences with the same outcome</li> <li>- I can predict the outcome of a sequence of commands"</li> <li>"- I can build the sequences of blocks I need</li> <li>- I can decide which blocks to use to meet the design</li> <li>- I can work out the actions of a sprite in an algorithm"</li> <li>"- I can choose backgrounds for the design</li> <li>- I can choose characters for the design</li> <li>- I can create a program based on the new design"</li> <li>"- I can build sequences of blocks to match my design</li> <li>- I can choose the images for my own design</li> <li>- I can create an algorithm"</li> <li>"- I can compare my project to my design</li> <li>- I can debug my program</li> <li>- I can improve my project by adding features"</li> </ul>
<b>Key Questions</b>	NA	<ul style="list-style-type: none"> <li><b>Can you move the sprite?</b></li> <li><b>How can I create a series of commands?</b></li> <li><b>How do I change the value of a command?</b></li> <li><b>How can I add another sprite to a project?</b></li> <li><b>What is an algorithm</b></li> <li><b>What is a programming block?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>How is a programme started?</b></li> <li><b>How can the outcome of a sequence be changed?</b></li> <li><b>How is a sequence of blocks constructed?</b></li> <li><b>How do you change the background?</b></li> <li><b>What does a sequence do?</b></li> <li><b>What does the word "debug" mean?</b></li> </ul>
<b>Vocabulary</b>	NA	ScratchJr, command, sprite, compare, programming, area, block, joining, start, run, program, background, delete, reset, algorithm, predict, effect, change, value, instructions, design.	music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat, instrument, open, edit.

## Year 2 - Computing systems and networks (IT around us)

	Prior Learning (Yr 1)	New Learning (Yr 2)	Future Learning
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>● use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>● recognise common uses of information technology beyond school</li> <li>● 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.</li> </ul>	<ul style="list-style-type: none"> <li>● use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>● recognise common uses of information technology beyond school</li> <li>● 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.</li> </ul>	<ul style="list-style-type: none"> <li>● use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>● 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</li> <li>● select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>● I can explain how these technology examples help us</li> <li>● I can explain technology as something that helps us</li> <li>● I can locate examples of technology in the classroom"</li> <li>● I can name the main parts of a computer</li> <li>● I can switch on and log into a computer</li> <li>● I can use a mouse to click and drag"</li> <li>● I can click and drag to make objects on a screen</li> <li>● I can use a mouse to create a picture</li> <li>● I can use a mouse to open a program"</li> <li>● I can save my work to a file</li> <li>● I can say what a keyboard is for</li> <li>● I can type my name on a computer"</li> <li>● I can delete letters</li> <li>● I can open my work from a file</li> <li>● I can use the arrow keys to move the cursor"</li> <li>● I can discuss how we benefit from these rules</li> <li>● I can give examples of some of these rules</li> <li>● I can identify rules to keep us safe and healthy when we are using technology in and beyond the home</li> </ul>	<ul style="list-style-type: none"> <li>● "- I can describe some uses of computers</li> <li>● - I can identify examples of computers</li> <li>● - I can identify that a computer is a part of IT"</li> <li>● "- I can identify examples of IT</li> <li>● - I can identify that some IT can be used in more than one way</li> <li>● - I can sort school IT by what it's used for"</li> <li>● "- I can find examples of information technology</li> <li>● - I can sort IT by where it is found</li> <li>● - I can talk about uses of information technology"</li> <li>● "- I can demonstrate how IT devices work together</li> <li>● - I can recognise common types of technology</li> <li>● - I can say why we use IT"</li> <li>● "- I can list different uses of information technology</li> <li>● - I can say how rules can help keep me safe</li> <li>● - I can talk about different rules for using IT"</li> <li>● "- I can explain the need to use IT in different ways</li> <li>● - I can identify the choices that I make when using IT</li> <li>● - I can use IT for different types of activities"</li> </ul>	<ul style="list-style-type: none"> <li>● "- I can explain that digital devices accept inputs</li> <li>● - I can explain that digital devices produce outputs</li> <li>● - I can follow a process"</li> <li>● "- I can classify input and output devices</li> <li>● - I can describe a simple process</li> <li>● - I can design a digital device"</li> <li>● "- I can explain how I use digital devices for different activities</li> <li>● - I can recognise similarities between using digital devices and non-digital tools</li> <li>● - I can suggest differences between using digital devices and non-digital tools"</li> <li>● "- I can discuss why we need a network switch</li> <li>● - I can explain how messages are passed through multiple connections</li> <li>● - I can recognise different connections"</li> <li>● "- I can demonstrate how information can be passed between devices</li> <li>● - I can explain the role of a switch, server, and wireless access point in a network</li> <li>● - I can recognise that a computer network is made up of a number of devices"</li> <li>● "- I can identify how devices in a network are connected together</li> <li>● - I can identify networked devices around me</li> <li>● - I can identify the benefits of computer networks"</li> </ul>

<b>Key Questions</b>	<ul style="list-style-type: none"> <li>• Can you identify technology around us?</li> <li>• Can you identify the main parts of a computer</li> <li>• What is the purpose of a mouse?</li> <li>• What is the purpose of a keyboard?</li> <li>• How can you edit text using a keyboard?</li> <li>• What 3 rules can you follow when using technology responsibly?</li> </ul>	<ul style="list-style-type: none"> <li>• What uses does a computer have?</li> <li>• Where are examples of IT in our school?</li> <li>• Where are examples of IT beyond our school?</li> <li>• Why do we use IT?</li> <li>• What rules could keep you safe when using IT?</li> <li>• How can I use IT in different ways?</li> </ul>	<ul style="list-style-type: none"> <li>• What is an input and an output?</li> <li>• How can we classify input and output devices?</li> <li>• What are the similarities and differences between a digital and non-digital tool?</li> <li>• What is a computer network?</li> <li>• How can information be passed between devices?</li> <li>• Can you identify a network of devices within school?</li> </ul>
<b>Vocabulary</b>	technology, computer, mouse, trackpad, keyboard, screen, double-click, typing.	Information technology (IT), computer, barcode, scanner/scan	digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets

## Year 2 - Creating media (Digital photography)

	Prior Learning (Yr 1)	New Learning (Yr 2)	Future Learning (Yr 3)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>● use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> </ul>	<ul style="list-style-type: none"> <li>● use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>● recognise common uses of information technology beyond school</li> <li>● 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.</li> </ul>	<ul style="list-style-type: none"> <li>● elect, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>● use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>● " -I can draw lines on a screen and explain which tools I used</li> <li>● - I can make marks on a screen and explain which tools I used</li> <li>● - I can use the paint tools to draw a picture"</li> <li>● " -I can make marks with the square and line tools</li> <li>● - I can use the shape and line tools effectively</li> <li>● - I can use the shape and line tools to recreate the work of an artist"</li> <li>● " -I can choose appropriate shapes</li> <li>● - I can create a picture in the style of an artist</li> <li>● - I can make appropriate colour choices"</li> <li>● " -I can choose appropriate paint tools and colours to recreate the work of an artist</li> <li>● - I can say which tools were helpful and why</li> <li>● - I know that different paint tools do different jobs"</li> <li>● " -I can change the colour and brush sizes</li> <li>● - I can make dots of colour on the page</li> <li>● - I can use dots of colour to create a picture in the style of an artist on my own"</li> <li>● " -I can explain that pictures can be made in lots of different ways</li> <li>● - I can say whether I prefer painting using a computer or using paper</li> <li>● - I can spot the differences between painting on a computer and on paper"</li> </ul>	<ul style="list-style-type: none"> <li>● " -I can explain what I did to capture a digital photo</li> <li>● - I can recognise what devices can be used to take photographs</li> <li>● - I can talk about how to take a photograph"</li> <li>● " -I can explain the process of taking a good photograph</li> <li>● - I can explain why a photo looks better in portrait or landscape format</li> <li>● - I can take photos in both landscape and portrait format"</li> <li>● " -I can discuss how to take a good photograph</li> <li>● - I can identify what is wrong with a photograph</li> <li>● - I can improve a photograph by retaking it"</li> <li>● " -I can experiment with different light sources</li> <li>● - I can explain why a picture may be unclear</li> <li>● - I can explore the effect that light has on a photo"</li> <li>● " -I can explain my choices</li> <li>● - I can recognise that images can be changed</li> <li>● - I can use a tool to achieve a desired effect"</li> <li>● " -I can apply a range of photography skills to capture a photo</li> <li>● - I can identify which photos are real and which have been changed</li> <li>● - I can recognise which photos have been changed"</li> </ul>	<ul style="list-style-type: none"> <li>● " -I can create an effective flip book—style animation</li> <li>● - I can draw a sequence of pictures</li> <li>● - I can explain how an animation/flip book works"</li> <li>● " -I can create an effective stop-frame animation</li> <li>● - I can explain why little changes are needed for each frame</li> <li>● - I can predict what an animation will look like"</li> <li>● " -I can break down a story into settings, characters and events</li> <li>● - I can create a storyboard</li> <li>● - I can describe an animation that is achievable on screen"</li> <li>● " -I can evaluate the quality of my animation</li> <li>● - I can review a sequence of frames to check my work</li> <li>● - I can use onion skinning to help me make small changes between frames"</li> <li>● " -I can evaluate another learner’s animation</li> <li>● - I can explain ways to make my animation better</li> <li>● - I can improve my animation based on feedback"</li> <li>● " -I can add other media to my animation</li> <li>● - I can evaluate my final film</li> <li>● - I can explain why I added other media to my animation"</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li>● <b>What is a freehand tool?</b></li> <li>● <b>What do the shape and line tools allow you to do?</b></li> <li>● <b>What choices do you need to think about when painting a digital picture?</b></li> </ul>	<ul style="list-style-type: none"> <li>● <b>What devices can be used to take a photograph?</b></li> <li>● <b>When should you take a photograph in landscape or portrait?</b></li> <li>● <b>What makes a good photograph?</b></li> </ul>	<ul style="list-style-type: none"> <li>● <b>What is an animation?</b></li> <li>● <b>What is a frame?</b></li> <li>● <b>What are the 3 components of a story?</b></li> <li>● <b>What is the process of onion skinning?</b></li> </ul>

	<ul style="list-style-type: none"> <li>• What do you need to think about when choosing the correct tool?</li> <li>• How can you create a digital painting?</li> <li>• What is the difference between a digital and on paper painting?</li> </ul>	<ul style="list-style-type: none"> <li>• Why might a picture be unclear?</li> <li>• How can an image be changed?</li> <li>• Can you identify the difference between a real photograph and one that has been changed?</li> </ul>	<ul style="list-style-type: none"> <li>• What makes a good animation?</li> <li>• What other media could be added to an animation?</li> </ul>
<b>Vocabulary</b>	paint program, tool, paintbrush, erase, fill, undo, shape tools, line tool, fill tool, undo tool, colour, brush style, brush size, pictures, painting, computers	device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, framing, lighting	animation, flip book, stopframe, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition.

<b>Year 2 - Programming A (Robot algorithms)</b>			
	<b>Prior Learning (Yr 1)</b>	<b>New Learning (Yr 2)</b>	<b>Future Learning (Yr 3)</b>
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>• understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>• create and debug simple programs</li> <li>• use logical reasoning to predict the behaviour of simple programs</li> <li>• recognise common uses of information technology beyond school</li> </ul>	<ul style="list-style-type: none"> <li>• understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>• create and debug simple programs</li> <li>• use logical reasoning to predict the behaviour of simple programs</li> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>• use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>• use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>• select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>• I can match a command to an outcome</li> <li>• I can predict the outcome of a command on a device</li> <li>• I can run a command on a device</li> <li>• I can follow an instruction</li> <li>• I can give directions</li> <li>• I can recall words that can be acted out</li> <li>• I can compare forwards and backwards movements</li> <li>• I can predict the outcome of a sequence involving forwards and backwards commands</li> <li>• I can start a sequence from the same place</li> <li>• I can compare left and right turns</li> <li>• I can experiment with turn and move commands to move a robot</li> <li>• I can predict the outcome of a sequence involving up to four commands</li> <li>• I can choose the order of commands in a sequence</li> <li>• I can debug my program</li> </ul>	<ul style="list-style-type: none"> <li>• "- I can choose a series of words that can be enacted as a sequence</li> <li>• - I can follow instructions given by someone else</li> <li>• - I can give clear instructions"</li> <li>• "- I can show the difference in outcomes between two sequences that consist of the same commands</li> <li>• - I can use an algorithm to program a sequence on a floor robot</li> <li>• - I can use the same instructions to create different algorithms"</li> <li>• "- I can compare my prediction to the program outcome</li> <li>• - I can follow a sequence</li> <li>• - I can predict the outcome of a sequence"</li> <li>• "- I can explain the choices I made for my mat design</li> <li>• - I can identify different routes around my mat</li> <li>• - I can test my mat to make sure that it is usable"</li> <li>• "- I can create an algorithm to meet my goal</li> </ul>	<ul style="list-style-type: none"> <li>• "- I can explain that objects in Scratch have attributes (linked to)</li> <li>• - I can identify the objects in a Scratch project (sprites, backdrops)</li> <li>• - I can recognise that commands in Scratch are represented as blocks"</li> <li>• "- I can choose a word which describes an on-screen action for my plan</li> <li>• - I can create a program following a design</li> <li>• - I can identify that each sprite is controlled by the commands I choose"</li> <li>• "- I can create a sequence of connected commands</li> <li>• - I can explain that the objects in my project will respond exactly to the code</li> <li>• - I can start a program in different ways"</li> <li>• "- I can combine sound commands</li> <li>• - I can explain what a sequence is</li> </ul>

	<ul style="list-style-type: none"> <li>I can explain what my program should do</li> <li>I can identify several possible solutions</li> <li>I can plan two programs</li> <li>I can use two different programs to get to the same place</li> </ul>	<ul style="list-style-type: none"> <li>- I can explain what my algorithm should achieve</li> <li>- I can use my algorithm to create a program"</li> <li>" - I can plan algorithms for different parts of a task</li> <li>- I can put together the different parts of my program</li> <li>- I can test and debug each part of the program"</li> </ul>	<ul style="list-style-type: none"> <li>- I can order notes into a sequence"</li> <li>" -I can build a sequence of commands</li> <li>- I can decide the actions for each sprite in a program</li> <li>- I can make design choices for my artwork"</li> <li>" -I can identify and name the objects I will need for a project</li> <li>- I can implement my algorithm as code</li> <li>- I can relate a task description to a design"</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li><b>What is a command?</b></li> <li><b>What is an instruction?</b></li> <li><b>Can you show a forward and backward movement?</b></li> <li><b>Can you show a forward, backward, left and right movement?</b></li> <li><b>Can you choose the order of commands to create a successful sequence?</b></li> <li><b>Can you identify a problem in a sequence and create a solution?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>What is a clear instruction?</b></li> <li><b>Why can there be a different outcome for 2 sequences that consist of the same commands?</b></li> <li><b>How can we predict the outcome of a program?</b></li> <li><b>Can you show 2 different routes around the mat?</b></li> <li><b>How will your algorithm meet your goal?</b></li> <li><b>What algorithms could you create for each part of a task?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>What is a sprite?</b></li> <li><b>What does a command do?</b></li> <li><b>What is code?</b></li> <li><b>How can sound commands be added to a project?</b></li> <li><b>How can a sprite be edited?</b></li> <li><b>Why is a task description important?</b></li> </ul>
<b>Vocabulary</b>	Bee-Bot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program.	instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, artwork, design, route, mat, debugging, decomposition	<ul style="list-style-type: none"> <li>Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task, design, run the code, order, note, chord, algorithm, bug, debug, code</li> </ul>

## Year 2 - Data and information (Pictograms)

	Prior Learning (Yr 1)	New Learning (Yr 2)	Future Learning (Yr 3)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>"-I can describe objects using labels</li> <li>- I can identify the label for a group of objects</li> <li>- I can match objects to groups"</li> <li>"- I can count a group of objects</li> <li>- I can count objects</li> <li>- I can group objects"</li> <li>"- I can describe an object</li> <li>- I can describe a property of an object</li> <li>- I can find objects with similar properties"</li> <li>"- I can count how many objects share a property</li> <li>- I can group objects in more than one way</li> <li>- I can group similar objects"</li> <li>"- I can choose how to group objects</li> <li>- I can describe groups of objects</li> <li>- I can record how many objects are in a group"</li> <li>"- I can compare groups of objects</li> <li>- I can decide how to group objects to answer a question</li> <li>- I can record and share what I have found"</li> </ul>	<ul style="list-style-type: none"> <li>I can compare totals in a tally chart</li> <li>- I can record data in a tally chart</li> <li>- I can represent a tally count as a total"</li> <li>"- I can enter data onto a computer</li> <li>- I can use a computer to view data in a different format</li> <li>- I can use pictograms to answer simple questions about objects"</li> <li>"- I can explain what the pictogram shows</li> <li>- I can organise data in a tally chart</li> <li>- I can use a tally chart to create a pictogram"</li> <li>"- I can answer 'more than'/'less than' and 'most/least' questions about an attribute</li> <li>- I can create a pictogram to arrange objects by an attribute</li> <li>- I can tally objects using a common attribute"</li> <li>"- I can choose a suitable attribute to compare people</li> <li>- I can collect the data I need</li> <li>- I can create a pictogram and draw conclusions from it"</li> <li>"- I can give simple examples of why information should not be shared</li> <li>- I can share what I have found out using a computer</li> <li>- I can use a computer program to present information in different ways"</li> </ul>	<ul style="list-style-type: none"> <li>"- I can create two groups of objects separated by one attribute</li> <li>- I can investigate questions with yes/no answers</li> <li>- I can make up a yes/no question about a collection of objects"</li> <li>"- I can arrange objects into a tree structure</li> <li>- I can create a group of objects within an existing group</li> <li>- I can select an attribute to separate objects into groups"</li> <li>"- I can group objects using my own yes/no questions</li> <li>- I can select objects to arrange in a branching database</li> <li>- I can test my branching database to see if it works"</li> <li>"- I can compare two branching database structures</li> <li>- I can create yes/no questions using given attributes</li> <li>- I can explain that questions need to be ordered carefully to split objects into similarly sized groups"</li> <li>"- I can create a physical version of a branching database</li> <li>- I can create questions that will enable objects to be uniquely identified</li> <li>- I can independently create questions to use in a branching database "</li> <li>"- I can create a branching database that reflects my plan</li> <li>- I can suggest real-world uses for branching databases</li> <li>- I can work with a partner to test my identification tool"</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li>Can you label a variety of objects?</li> <li>Can you count a group of objects?</li> <li>Can you describe a group of objects based on their properties?</li> <li>Can you count how many objects share a property?</li> <li>Can you group a variety of objects?</li> <li>Can you group a variety of objects based on a question?</li> </ul>	<ul style="list-style-type: none"> <li>How can I record data in a tally chart?</li> <li>How can I record data on a computer?</li> <li>What is a pictogram?</li> <li>What is an attribute?</li> <li>How could you collect data for a pictogram?</li> <li>Why should information not be shared?</li> </ul>	<ul style="list-style-type: none"> <li>Why does data need to be sorted?</li> <li>What does a tree structure allow us to do with data?</li> <li>How can we test a branching database?</li> <li>Why does a branching database need to be well structured?</li> <li>What question could you ask to separate mammals and birds?</li> </ul>

			<ul style="list-style-type: none"> <li>Where would you find a branching database in the real world?</li> </ul>
<b>Vocabular</b> <b>y</b>	<ul style="list-style-type: none"> <li>object, label, group, search, image, property, colour, size, shape, value, data set, more, less, most, fewest, least, the same</li> </ul>	more than, less than, most, least, common, popular, organise, data, object, tally chart, votes, total, pictogram, enter, data, compare, objects, count, explain, attribute, group, same, different, conclusion, block diagram, sharing	attribute, value, questions, table, objects, branching, database, objects, equal, even, separate, structure, compare, order, organise, selecting, information, decision tree.



## Year 2 - Creating media (Digital music)

	Prior Learning (Yr 1)	New Learning (Yr 2)	Future Learning (Yr 3)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>● use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>● 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.</li> </ul>	<ul style="list-style-type: none"> <li>● Use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> </ul>	<ul style="list-style-type: none"> <li>● use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>● select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>● "- I can identify and find keys on a keyboard</li> <li>● - I can open a word processor</li> <li>● - I can recognise keys on a keyboard"</li> <li>● "- I can enter text into a computer</li> <li>● - I can use backspace to remove text</li> <li>● - I can use letter, number, and space keys"</li> <li>● "- I can explain what the keys that I have learnt about already do</li> <li>● - I can identify the toolbar and use bold, italic, and underline</li> <li>● - I can type capital letters"</li> <li>● "- I can change the font</li> <li>● - I can select all of the text by clicking and dragging</li> <li>● - I can select a word by double-clicking"</li> <li>● "- I can decide if my changes have improved my writing</li> <li>● - I can say what tool I used to change the text</li> <li>● - I can use 'undo' to remove changes"</li> <li>● "- I can explain the differences between typing and writing</li> <li>● - I can make changes to text on a computer</li> <li>● - I can say why I prefer typing or writing"</li> </ul>	<ul style="list-style-type: none"> <li>● I can describe music using adjectives</li> <li>● - I can identify simple differences in pieces of music</li> <li>● - I can say what I do and don't like about a piece of music"</li> <li>● "- I can create a rhythm pattern</li> <li>● - I can explain that music is created and played by humans</li> <li>● - I can play an instrument following a rhythm pattern"</li> <li>● "- I can connect images with sounds</li> <li>● - I can relate an idea to a piece of music</li> <li>● - I can use a computer to experiment with pitch"</li> <li>● "- I can explain how my music can be played in different ways</li> <li>● - I can identify that music is a sequence of notes</li> <li>● - I can refine my musical pattern on a computer"</li> <li>● "- I can add a sequence of notes to my rhythm</li> <li>● - I can create a rhythm which represents an animal I've chosen</li> <li>● - I can create my animal's rhythm on a computer"</li> <li>● "- I can explain how I changed my work</li> <li>● - I can listen to music and describe how it makes me feel</li> <li>● - I can review my work"</li> </ul>	<ul style="list-style-type: none"> <li>● "- I can explain the difference between text and images</li> <li>● - I can identify the advantages and disadvantages of using text and images</li> <li>● - I can recognise that text and images can communicate messages clearly"</li> <li>● "- I can change font style, size, and colours for a given purpose</li> <li>● - I can edit text</li> <li>● - I can explain that text can be changed to communicate more clearly"</li> <li>● "- I can create a template for a particular purpose</li> <li>● - I can define the term 'page orientation'</li> <li>● - I can recognise placeholders and say why they are important"</li> <li>● "- I can choose the best locations for my content</li> <li>● - I can make changes to content after I've added it</li> <li>● - I can paste text and images to create a magazine cover"</li> <li>● "- I can choose a suitable layout for a given purpose</li> <li>● - I can identify different layouts</li> <li>● - I can match a layout to a purpose"</li> <li>● "- I can compare work made on desktop publishing to work created by hand</li> <li>● - I can identify the uses of desktop publishing in the real world</li> <li>● - I can say why desktop publishing might be helpful"</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li>● Can you explain how I can write on a computer?</li> <li>● Can you add and remove text on a computer?</li> <li>● Can you identify the toolbar?</li> <li>● Can you change the font of the text?</li> <li>● Can you identify what tool was used to change the text?</li> <li>● What is the difference between typing and writing?</li> </ul>	<ul style="list-style-type: none"> <li>● What do you like and dislike about a piece of music?</li> <li>● What is a rhythm?</li> <li>● How can we link an idea to a piece of music?</li> <li>● How can music be changed on a computer?</li> <li>● How can a sequence of notes be added on a computer?</li> <li>● What would you change in your work next time?</li> </ul>	<ul style="list-style-type: none"> <li>● What is the difference between text and image?</li> <li>● Give an example of when text would need to be communicated more clearly?</li> <li>● Define the term "page orientation"?</li> <li>● What does the word content mean?</li> </ul>

			<ul style="list-style-type: none"> <li>• <b>Why is the layout of a page important for the purpose of the piece?</b></li> <li>• <b>Where is desktop publishing used in the real world?</b></li> </ul>
<b>Vocabulary</b>	word processor, keyboard, keys, letters, type, numbers, space, backspace, text cursor, capital letters, toolbar, bold, italic, underline, mouse, select, font, undo, redo, format, compare, typing, writing.	music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat, instrument, open, edit.	text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits

## Year 2 - Programming B (Programming quizzes)

	Prior Learning (Yr 1)	New Learning (Yr 2)	Future Learning (Yr 3)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>create and debug simple programs</li> <li>use logical reasoning to predict the behaviour of simple programs</li> </ul>	<ul style="list-style-type: none"> <li>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>create and debug simple programs</li> <li>use logical reasoning to predict the behaviour of simple programs</li> <li>use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>"- I can compare different programming tools</li> <li>- I can find which commands to move a sprite</li> <li>- I can use commands to move a sprite"</li> <li>"- I can run my program</li> <li>- I can use a Start block in a program</li> <li>- I can use more than one block by joining them together"</li> <li>"- I can change the value</li> <li>- I can find blocks that have numbers</li> <li>- I can say what happens when I change a value"</li> <li>"- I can add blocks to each of my sprites</li> <li>- I can delete a sprite</li> <li>- I can show that a project can include more than one sprite"</li> <li>"- I can choose appropriate artwork for my project</li> <li>- I can create an algorithm for each sprite</li> <li>- I can decide how each sprite will move"</li> <li>"- I can add programming blocks based on my algorithm</li> <li>- I can test the programs I have created</li> <li>- I can use sprites that match my design"</li> </ul>	<ul style="list-style-type: none"> <li>I can identify that a program needs to be started</li> <li>- I can identify the start of a sequence</li> <li>- I can show how to run my program"</li> <li>"- I can change the outcome of a sequence of commands</li> <li>- I can match two sequences with the same outcome</li> <li>- I can predict the outcome of a sequence of commands"</li> <li>"- I can build the sequences of blocks I need</li> <li>- I can decide which blocks to use to meet the design</li> <li>- I can work out the actions of a sprite in an algorithm"</li> <li>"- I can choose backgrounds for the design</li> <li>- I can choose characters for the design</li> <li>- I can create a program based on the new design"</li> <li>"- I can build sequences of blocks to match my design</li> <li>- I can choose the images for my own design</li> <li>- I can create an algorithm"</li> <li>"- I can compare my project to my design</li> <li>- I can debug my program</li> <li>- I can improve my project by adding features"</li> </ul>	<ul style="list-style-type: none"> <li>"- I can choose which keys to use for actions and explain my choices</li> <li>- I can explain the relationship between an event and an action</li> <li>- I can identify a way to improve a program"</li> <li>"- I can choose a character for my project</li> <li>- I can choose a suitable size for a character in a maze</li> <li>- I can program movement"</li> <li>"- I can choose blocks to set up my program</li> <li>- I can consider the real world when making design choices</li> <li>- I can use a programming extension"</li> <li>"- I can build more sequences of commands to make my design work</li> <li>- I can choose suitable keys to turn on additional features</li> <li>- I can identify additional features (from a given set of blocks)"</li> <li>"- I can match a piece of code to an outcome</li> <li>- I can modify a program using a design</li> <li>- I can test a program against a given design"</li> <li>"- I can evaluate my project</li> <li>- I can implement my design</li> <li>- I can make design choices and justify them"</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li>Can you move the sprite?</li> <li>How can I create a series of commands?</li> <li>How do I change the value of a command?</li> <li>How can I add another sprite to a project?</li> </ul>	<ul style="list-style-type: none"> <li>How is a programme started?</li> <li>How can the outcome of a sequence be changed?</li> <li>How is a sequence of blocks constructed?</li> <li>How do you change the background?</li> </ul>	<ul style="list-style-type: none"> <li>What is the relationship between an event and an action?</li> <li>How can movement be programmed?</li> <li>What is a programming extension?</li> <li>What additional features could be used in a program?</li> </ul>

	<ul style="list-style-type: none"> <li>• What is an algorithm</li> <li>• What is a programming block?</li> </ul>	<ul style="list-style-type: none"> <li>• What does a sequence do?</li> <li>• What does the word “debug” mean?</li> </ul>	<ul style="list-style-type: none"> <li>• What does the term “modify” mean?</li> <li>• What needs to be considered when creating a maze-based challenge?</li> </ul>
<b>Vocabulary</b>	<ul style="list-style-type: none"> <li>• ScratchJr, command, sprite, compare, programming, area, block, joining, start, run, program, background, delete, reset, algorithm, predict, effect, change, value, instructions, design.</li> </ul>	<ul style="list-style-type: none"> <li>sequence, command, program, run, start, outcome, predict, blocks, design, actions, sprite, project, modify, change, algorithm, build, match, compare, debug, features, evaluate, decomposition, code.</li> </ul>	<ul style="list-style-type: none"> <li>motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, action, debugging, errors, setup, code, test, debug, actions.</li> </ul>

## Year 3 - Computing systems and networks (Connecting computers)

	Prior Learning (Yr 2)	New Learning (Yr 3)	Future Learning (Yr 4)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>● use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>● recognise common uses of information technology beyond school</li> <li>● 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.</li> </ul>	<ul style="list-style-type: none"> <li>● use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>● 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</li> <li>● select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>● 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</li> <li>● use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>● select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>● use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>● "- I can describe some uses of computers</li> <li>● - I can identify examples of computers</li> <li>● - I can identify that a computer is a part of IT"</li> <li>● "- I can identify examples of IT</li> <li>● - I can identify that some IT can be used in more than one way</li> <li>● - I can sort school IT by what it's used for"</li> <li>● "- I can find examples of information technology</li> <li>● - I can sort IT by where it is found</li> <li>● - I can talk about uses of information technology"</li> <li>● "- I can demonstrate how IT devices work together</li> <li>● - I can recognise common types of technology</li> <li>● - I can say why we use IT"</li> <li>● "- I can list different uses of information technology</li> <li>● - I can say how rules can help keep me safe</li> <li>● - I can talk about different rules for using IT"</li> <li>● "- I can explain the need to use IT in different ways</li> <li>● - I can identify the choices that I make when using IT</li> <li>● - I can use IT for different types of activities"</li> </ul>	<ul style="list-style-type: none"> <li>● "- I can explain that digital devices accept inputs</li> <li>● - I can explain that digital devices produce outputs</li> <li>● - I can follow a process"</li> <li>● "- I can classify input and output devices</li> <li>● - I can describe a simple process</li> <li>● - I can design a digital device"</li> <li>● "- I can explain how I use digital devices for different activities</li> <li>● - I can recognise similarities between using digital devices and non-digital tools</li> <li>● - I can suggest differences between using digital devices and non-digital tools"</li> <li>● "- I can discuss why we need a network switch</li> <li>● - I can explain how messages are passed through multiple connections</li> <li>● - I can recognise different connections"</li> <li>● "- I can demonstrate how information can be passed between devices</li> <li>● - I can explain the role of a switch, server, and wireless access point in a network</li> <li>● - I can recognise that a computer network is made up of a number of devices"</li> <li>● "- I can identify how devices in a network are connected together</li> <li>● - I can identify networked devices around me</li> <li>● - I can identify the benefits of computer networks"</li> </ul>	<ul style="list-style-type: none"> <li>● I can demonstrate how information is shared across the internet</li> <li>● - I can describe the internet as a network of networks</li> <li>● - I can discuss why a network needs protecting"</li> <li>● "- I can describe networked devices and how they connect</li> <li>● - I can explain that the internet is used to provide many services</li> <li>● - I can recognise that the World Wide Web contains websites and web pages"</li> <li>● "- I can describe how to access websites on the WWW</li> <li>● - I can describe where websites are stored when uploaded to the WWW</li> <li>● - I can explain the types of media that can be shared on the WWW"</li> <li>● "- I can explain that internet services can be used to create content online</li> <li>● - I can explain what media can be found on websites</li> <li>● - I can recognise that I can add content to the WWW"</li> <li>● "- I can explain that there are rules to protect content</li> <li>● - I can explain that websites and their content are created by people</li> <li>● - I can suggest who owns the content on websites "</li> <li>● "- I can explain that not everything on the World Wide Web is true</li> <li>● - I can explain why I need to think carefully before I share or reshare content</li> <li>● - I can explain why some information I find online may not be honest, accurate, or legal"</li> </ul>

<b>Key Questions</b>	<ul style="list-style-type: none"> <li>• What uses does a computer have?</li> <li>• Where are examples of IT in our school?</li> <li>• Where are examples of IT beyond our school?</li> <li>• Why do we use IT?</li> <li>• What rules could keep you safe when using IT?</li> <li>• How can I use IT in different ways?</li> </ul>	<ul style="list-style-type: none"> <li>• What is an input and an output?</li> <li>• How can we classify input and output devices?</li> <li>• What are the similarities and differences between a digital and non-digital tool?</li> <li>• What is a computer network?</li> <li>• How can information be passed between devices?</li> <li>• Can you identify a network of devices within school?</li> </ul>	<ul style="list-style-type: none"> <li>• Why does a network need protection?</li> <li>• Name 3 services the internet provides?</li> <li>• What types of media can be shared to the WWW?</li> <li>• How can content be added to the WWW?</li> <li>• What rules protect content found online?</li> <li>• Is everything on the WWW true?</li> </ul>
<b>Vocabulary</b>	Information technology (IT), computer, barcode, scanner/scan	digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets	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, sharing, ownership, permission, information, accurate, honest, content, adverts

## Year 3 - Creating media (Stop-frame animation)

	Prior Learning (Yr 2)	New Learning (Yr 3)	Future Learning (Yr 4)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>Use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> </ul>	<ul style="list-style-type: none"> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>I can describe music using adjectives</li> <li>- I can identify simple differences in pieces of music</li> <li>- I can say what I do and don't like about a piece of music"</li> <li>" -I can create a rhythm pattern</li> <li>- I can explain that music is created and played by humans</li> <li>- I can play an instrument following a rhythm pattern"</li> <li>" -I can connect images with sounds</li> <li>- I can relate an idea to a piece of music</li> <li>- I can use a computer to experiment with pitch"</li> <li>" -I can explain how my music can be played in different ways</li> <li>- I can identify that music is a sequence of notes</li> <li>- I can refine my musical pattern on a computer"</li> <li>" -I can add a sequence of notes to my rhythm</li> <li>- I can create a rhythm which represents an animal I've chosen</li> <li>- I can create my animal's rhythm on a computer"</li> <li>" -I can explain how I changed my work</li> <li>- I can listen to music and describe how it makes me feel</li> <li>- I can review my work"</li> </ul>	<ul style="list-style-type: none"> <li>" -I can create an effective flip book—style animation</li> <li>- I can draw a sequence of pictures</li> <li>- I can explain how an animation/flip book works"</li> <li>" -I can create an effective stop-frame animation</li> <li>- I can explain why little changes are needed for each frame</li> <li>- I can predict what an animation will look like"</li> <li>" -I can break down a story into settings, characters and events</li> <li>- I can create a storyboard</li> <li>- I can describe an animation that is achievable on screen"</li> <li>" -I can evaluate the quality of my animation</li> <li>- I can review a sequence of frames to check my work</li> <li>- I can use onion skinning to help me make small changes between frames"</li> <li>" -I can evaluate another learner's animation</li> <li>- I can explain ways to make my animation better</li> <li>- I can improve my animation based on feedback"</li> <li>" -I can add other media to my animation</li> <li>- I can evaluate my final film</li> <li>- I can explain why I added other media to my animation"</li> </ul>	<ul style="list-style-type: none"> <li>" -I can explain that the person who records the sound can say who is allowed to use it</li> <li>- I can identify the input and output devices used to record and play sound</li> <li>- I can use a computer to record audio"</li> <li>" -I can discuss what sounds can be added to a podcast</li> <li>- I can inspect the soundwave view to know where to trim my recording</li> <li>- I can re-record my voice to improve my recording"</li> <li>" -I can explain how sounds can be combined to make a podcast more engaging</li> <li>- I can plan appropriate content for a podcast</li> <li>- I can save my project so the different parts remain editable"</li> <li>" -I can improve my voice recordings</li> <li>- I can record content following my plan</li> <li>- I can review the quality of my recordings"</li> <li>" -I can arrange multiple sounds to create the effect I want</li> <li>- I can explain the difference between saving a project and exporting an audio file</li> <li>- I can open my project to continue working on it"</li> <li>" -I can choose appropriate edits to improve my podcast</li> <li>- I can listen to an audio recording to identify its strengths</li> <li>- I can suggest improvements to an audio recording"</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li><b>What do you like and dislike about a piece of music?</b></li> <li><b>What is a rhythm?</b></li> <li><b>How can we link an idea to a piece of music?</b></li> <li><b>How can music be changed on a computer?</b></li> <li><b>How can a sequence of notes be added on a computer?</b></li> <li><b>What would you change in your work next time?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>What is an animation?</b></li> <li><b>What is a frame?</b></li> <li><b>What are the 3 components of a story?</b></li> <li><b>What is the process of onion skinning?</b></li> <li><b>What makes a good animation?</b></li> <li><b>What other media could be added to an animation?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>What input and output devices are required to record and play sound?</b></li> <li><b>What is a soundwave and how can it be trimmed?</b></li> <li><b>How can a podcast be recorded to remain editable?</b></li> <li><b>Why is it to follow a plan when recording a podcast?</b></li> </ul>

			<ul style="list-style-type: none"> <li>• <b>What is the difference between saving and exporting an audio file?</b></li> <li>• <b>What improvements would you make to your podcast for next time?</b></li> </ul>
<b>Vocabulary</b>	music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat, instrument, open, edit.	animation, flip book, stopframe, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition.	audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback.



## Year 3 - Programming A (Sequencing sounds)

	Prior Learning (Yr 2)	New Learning (Yr 3)	Future Learning (Yr 4)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>create and debug simple programs</li> <li>use logical reasoning to predict the behaviour of simple programs</li> <li>use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>I can identify that a program needs to be started</li> <li>- I can identify the start of a sequence</li> <li>- I can show how to run my program"</li> <li>" -I can change the outcome of a sequence of commands</li> <li>- I can match two sequences with the same outcome</li> <li>- I can predict the outcome of a sequence of commands"</li> <li>" -I can build the sequences of blocks I need</li> <li>- I can decide which blocks to use to meet the design</li> <li>- I can work out the actions of a sprite in an algorithm"</li> <li>" -I can choose backgrounds for the design</li> <li>- I can choose characters for the design</li> <li>- I can create a program based on the new design"</li> <li>" -I can build sequences of blocks to match my design</li> <li>- I can choose the images for my own design</li> <li>- I can create an algorithm"</li> <li>" -I can compare my project to my design</li> <li>- I can debug my program</li> <li>- I can improve my project by adding features"</li> </ul>	<ul style="list-style-type: none"> <li>" -I can explain that objects in Scratch have attributes (linked to)</li> <li>- I can identify the objects in a Scratch project (sprites, backdrops)</li> <li>- I can recognise that commands in Scratch are represented as blocks"</li> <li>" -I can choose a word which describes an on-screen action for my plan</li> <li>- I can create a program following a design</li> <li>- I can identify that each sprite is controlled by the commands I choose"</li> <li>" -I can create a sequence of connected commands</li> <li>- I can explain that the objects in my project will respond exactly to the code</li> <li>- I can start a program in different ways"</li> <li>" -I can combine sound commands</li> <li>- I can explain what a sequence is</li> <li>- I can order notes into a sequence"</li> <li>" -I can build a sequence of commands</li> <li>- I can decide the actions for each sprite in a program</li> <li>- I can make design choices for my artwork"</li> <li>" -I can identify and name the objects I will need for a project</li> <li>- I can implement my algorithm as code</li> <li>- I can relate a task description to a design"</li> </ul>	<ul style="list-style-type: none"> <li>I can create a code snippet for a given purpose</li> <li>- I can explain the effect of changing a value of a command</li> <li>- I can program a computer by typing commands"</li> <li>" -I can test my algorithm in a text-based language</li> <li>- I can use a template to create a design for my program</li> <li>- I can write an algorithm to produce a given outcome"</li> <li>" -I can identify everyday tasks that include repetition as part of a sequence, eg brushing teeth, dance moves</li> <li>- I can identify patterns in a sequence</li> <li>- I can use a count-controlled loop to produce a given outcome"</li> <li>" -I can choose which values to change in a loop</li> <li>- I can identify the effect of changing the number of times a task is repeated</li> <li>- I can predict the outcome of a program containing a count-controlled loop"</li> <li>" -I can explain that a computer can repeatedly call a procedure</li> <li>- I can identify 'chunks' of actions in the real world</li> <li>- I can use a procedure in a program"</li> <li>" -I can design a program that includes count-controlled loops</li> <li>- I can develop my program by debugging it</li> <li>- I can make use of my design to write a program"</li> </ul>

<b>Key Questions</b>	<ul style="list-style-type: none"> <li>• How is a programme started?</li> <li>• How can the outcome of a sequence be changed?</li> <li>• How is a sequence of blocks constructed?</li> <li>• How do you change the background?</li> <li>• What does a sequence do?</li> <li>• What does the word “debug” mean?</li> </ul>	<ul style="list-style-type: none"> <li>• What is a sprite?</li> <li>• What does a command do?</li> <li>• What is code?</li> <li>• How can sound commands be added to a project?</li> <li>• How can a sprite be edited?</li> <li>• Why is a task description important?</li> </ul>	<ul style="list-style-type: none"> <li>• What effect can changing the value of a command have?</li> <li>• Define “text-based language”?</li> <li>• Name 3 everyday tasks that include repetition?</li> <li>• What is meant by a “loop”?</li> <li>• What does a computer do when it repeatedly calls a procedure?</li> <li>• What does a “count-controlled” loop do?</li> </ul>
<b>Vocabulary</b>	sequence, command, program, run, start, outcome, predict, blocks, design, actions, sprite, project, modify, change, algorithm, build, match, compare, debug, features, evaluate, decomposition, code.	Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task, design, run the code, order, note, chord, algorithm, bug, debug, code	Logo (programming environment), program, turtle, commands, code snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled loop, value, trace, decompose, procedure.

## Year 3 - Data and information (Branching databases)

	Prior Learning (Yr 2)	New Learning (Yr 3)	Future Learning (Yr 4)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>I can compare totals in a tally chart</li> <li>- I can record data in a tally chart</li> <li>- I can represent a tally count as a total"</li> <li>" -I can enter data onto a computer</li> <li>- I can use a computer to view data in a different format</li> <li>- I can use pictograms to answer simple questions about objects"</li> <li>" -I can explain what the pictogram shows</li> <li>- I can organise data in a tally chart</li> <li>- I can use a tally chart to create a pictogram"</li> <li>" -I can answer 'more than'/'less than' and 'most/least' questions about an attribute</li> <li>- I can create a pictogram to arrange objects by an attribute</li> <li>- I can tally objects using a common attribute"</li> <li>" -I can choose a suitable attribute to compare people</li> <li>- I can collect the data I need</li> <li>- I can create a pictogram and draw conclusions from it"</li> <li>" -I can give simple examples of why information should not be shared</li> <li>- I can share what I have found out using a computer</li> <li>- I can use a computer program to present information in different ways"</li> </ul>	<ul style="list-style-type: none"> <li>" -I can create two groups of objects separated by one attribute</li> <li>- I can investigate questions with yes/no answers</li> <li>- I can make up a yes/no question about a collection of objects"</li> <li>" -I can arrange objects into a tree structure</li> <li>- I can create a group of objects within an existing group</li> <li>- I can select an attribute to separate objects into groups"</li> <li>" -I can group objects using my own yes/no questions</li> <li>- I can select objects to arrange in a branching database</li> <li>- I can test my branching database to see if it works"</li> <li>" -I can compare two branching database structures</li> <li>- I can create yes/no questions using given attributes</li> <li>- I can explain that questions need to be ordered carefully to split objects into similarly sized groups"</li> <li>" -I can create a physical version of a branching database</li> <li>- I can create questions that will enable objects to be uniquely identified</li> <li>- I can independently create questions to use in a branching database "</li> <li>" -I can create a branching database that reflects my plan</li> <li>- I can suggest real-world uses for branching databases</li> <li>- I can work with a partner to test my identification tool"</li> </ul>	<ul style="list-style-type: none"> <li>I can choose a data set to answer a given question</li> <li>- I can identify data that can be gathered over time</li> <li>- I can suggest questions that can be answered using a given data set"</li> <li>" -I can explain what data can be collected using sensors</li> <li>- I can identify that data from sensors can be recorded</li> <li>- I can use data from a sensor to answer a given question"</li> <li>" -I can identify the intervals used to collect data</li> <li>- I can recognise that a data logger collects data at given points</li> <li>- I can talk about the data that I have captured"</li> <li>" -I can explain that there are different ways to view data</li> <li>- I can sort data to find information</li> <li>- I can view data at different levels of detail"</li> <li>" -I can plan how to collect data using a data logger</li> <li>- I can propose a question that can be answered using logged data</li> <li>- I can use a data logger to collect data"</li> <li>" -I can draw conclusions from the data that I have collected</li> <li>- I can explain the benefits of using a data logger</li> <li>- I can interpret data that has been collected using a data logger"</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li>How can I record data in a tally chart?</li> <li>How can I record data on a computer?</li> <li>What is a pictogram?</li> <li>What is an attribute?</li> <li>How could you collect data for a pictogram?</li> <li>Why should information not be shared?</li> </ul>	<ul style="list-style-type: none"> <li>Why does data need to be sorted?</li> <li>What does a tree structure allow us to do with data?</li> <li>How can we test a branching database?</li> <li>Why does a branching database need to be well structured?</li> <li>What question could you ask to separate mammals and birds?</li> </ul>	<ul style="list-style-type: none"> <li>Name 3 types of data that can be gathered over time?</li> <li>What type of data can be collected using a sensor?</li> <li>What is a data logger and what data can it collect?</li> <li>Name 3 ways to view data?</li> <li>How could a data logger be used to collect the temperature in a room throughout the day?</li> <li>What are the benefits of using a data logger?</li> </ul>

		<ul style="list-style-type: none"> <li>• <b>Where would you find a branching database in the real world?</b></li> </ul>	
<b>Vocabular</b> <b>y</b>	more than, less than, most, least, common, popular, organise, data, object, tally chart, votes, total, pictogram, enter, data, compare, objects, count, explain, attribute, group, same, different, conclusion, block diagram, sharing	attribute, value, questions, table, objects, branching, database, objects, equal, even, separate, structure, compare, order, organise, selecting, information, decision tree.	data, table, layout, input device, sensor, logger, logging, data point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.

## Year 3 - Creating media (Desktop publishing)

	Prior Learning (Yr 2)	New Learning (Yr 3)	Future Learning (Yr 4)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>Use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> </ul>	<ul style="list-style-type: none"> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>I can describe music using adjectives</li> <li>- I can identify simple differences in pieces of music</li> <li>- I can say what I do and don't like about a piece of music"</li> <li>" -I can create a rhythm pattern</li> <li>- I can explain that music is created and played by humans</li> <li>- I can play an instrument following a rhythm pattern"</li> <li>" -I can connect images with sounds</li> <li>- I can relate an idea to a piece of music</li> <li>- I can use a computer to experiment with pitch"</li> <li>" -I can explain how my music can be played in different ways</li> <li>- I can identify that music is a sequence of notes</li> <li>- I can refine my musical pattern on a computer"</li> <li>" -I can add a sequence of notes to my rhythm</li> <li>- I can create a rhythm which represents an animal I've chosen</li> <li>- I can create my animal's rhythm on a computer"</li> <li>" -I can explain how I changed my work</li> <li>- I can listen to music and describe how it makes me feel</li> <li>- I can review my work"</li> </ul>	<ul style="list-style-type: none"> <li>" -I can explain the difference between text and images</li> <li>- I can identify the advantages and disadvantages of using text and images</li> <li>- I can recognise that text and images can communicate messages clearly"</li> <li>" -I can change font style, size, and colours for a given purpose</li> <li>- I can edit text</li> <li>- I can explain that text can be changed to communicate more clearly"</li> <li>" -I can create a template for a particular purpose</li> <li>- I can define the term 'page orientation'</li> <li>- I can recognise placeholders and say why they are important"</li> <li>" -I can choose the best locations for my content</li> <li>- I can make changes to content after I've added it</li> <li>- I can paste text and images to create a magazine cover"</li> <li>" -I can choose a suitable layout for a given purpose</li> <li>- I can identify different layouts</li> <li>- I can match a layout to a purpose"</li> <li>" -I can compare work made on desktop publishing to work created by hand</li> <li>- I can identify the uses of desktop publishing in the real world</li> <li>- I can say why desktop publishing might be helpful"</li> </ul>	<ul style="list-style-type: none"> <li>I can explain why I might crop an image</li> <li>I can improve an image by rotating it</li> <li>I can use photo editing software to crop an image</li> <li>I can experiment with different colour effects</li> <li>I can explain that different colour effects make you think and feel different things</li> <li>I can explain why I chose certain colour effects"</li> <li>I can add to the composition of an image by cloning</li> <li>I can identify how a photo edit can be improved</li> <li>I can remove parts of an image using cloning"</li> <li>I can experiment with tools to select and copy part of an image</li> <li>I can explain why photos might be edited</li> <li>I can use a range of tools to copy between images"</li> <li>I can choose suitable images for my project</li> <li>I can create a project that is a combination of other images</li> <li>I can describe the image I want to create"</li> <li>I can combine text and my image to complete the project</li> <li>I can review images against a given criteria</li> <li>I can use feedback to guide making changes"</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li><b>What do you like and dislike about a piece of music?</b></li> <li><b>What is a rhythm?</b></li> <li><b>How can we link an idea to a piece of music?</b></li> <li><b>How can music be changed on a computer?</b></li> <li><b>How can a sequence of notes be added on a computer?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>What is the difference between text and image?</b></li> <li><b>Give an example of when text would need to be communicated more clearly?</b></li> <li><b>Define the term "page orientation"?</b></li> <li><b>What does the word content mean?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Why might an image need to be cropped?</b></li> <li><b>How can the colour effects on an image affect how it is perceived?</b></li> <li><b>What does cloning mean?</b></li> <li><b>Why might photos be edited?</b></li> </ul>

	<ul style="list-style-type: none"> <li>• <b>What would you change in your work next time?</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Why is the layout of a page important for the purpose of the piece?</b></li> <li>• <b>Where is desktop publishing used in the real world?</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>How can we ensure that images are suitable for a project?</b></li> <li>• <b>How can text be added to an image?</b></li> </ul>
<b>Vocabulary</b>	music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat, instrument, open, edit.	text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits	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.

## Year 3 - Programming B (Events and actions in programs)

	Prior Learning (Yr 2)	New Learning (Yr 3)	Future Learning (Yr 4)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>create and debug simple programs</li> <li>use logical reasoning to predict the behaviour of simple programs</li> <li>use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>I can identify that a program needs to be started</li> <li>- I can identify the start of a sequence</li> <li>- I can show how to run my program"</li> <li>"- I can change the outcome of a sequence of commands</li> <li>- I can match two sequences with the same outcome</li> <li>- I can predict the outcome of a sequence of commands"</li> <li>"- I can build the sequences of blocks I need</li> <li>- I can decide which blocks to use to meet the design</li> <li>- I can work out the actions of a sprite in an algorithm"</li> <li>"- I can choose backgrounds for the design</li> <li>- I can choose characters for the design</li> <li>- I can create a program based on the new design"</li> <li>"- I can build sequences of blocks to match my design</li> <li>- I can choose the images for my own design</li> <li>- I can create an algorithm"</li> <li>"- I can compare my project to my design</li> <li>- I can debug my program</li> <li>- I can improve my project by adding features"</li> </ul>	<ul style="list-style-type: none"> <li>"- I can choose which keys to use for actions and explain my choices</li> <li>- I can explain the relationship between an event and an action</li> <li>- I can identify a way to improve a program"</li> <li>"- I can choose a character for my project</li> <li>- I can choose a suitable size for a character in a maze</li> <li>- I can program movement"</li> <li>"- I can choose blocks to set up my program</li> <li>- I can consider the real world when making design choices</li> <li>- I can use a programming extension"</li> <li>"- I can build more sequences of commands to make my design work</li> <li>- I can choose suitable keys to turn on additional features</li> <li>- I can identify additional features (from a given set of blocks)"</li> <li>"- I can match a piece of code to an outcome</li> <li>- I can modify a program using a design</li> <li>- I can test a program against a given design"</li> <li>"- I can evaluate my project</li> <li>- I can implement my design</li> <li>- I can make design choices and justify them"</li> </ul>	<ul style="list-style-type: none"> <li>"- I can list an everyday task as a set of instructions including repetition</li> <li>- I can modify a snippet of code to create a given outcome</li> <li>- I can predict the outcome of a snippet of code"</li> <li>"- I can choose when to use a count-controlled and an infinite loop</li> <li>- I can modify loops to produce a given outcome</li> <li>- I can recognise that some programming languages enable more than one process to be run at once"</li> <li>"- I can choose which action will be repeated for each object</li> <li>- I can evaluate the effectiveness of the repeated sequences used in my program</li> <li>- I can explain what the outcome of the repeated action should be"</li> <li>"- I can explain the effect of my changes</li> <li>- I can identify which parts of a loop can be changed</li> <li>- I can re-use existing code snippets on new sprites"</li> <li>"- I can develop my own design explaining what my project will do</li> <li>- I can evaluate the use of repetition in a project</li> <li>- I can select key parts of a given project to use in my own design"</li> <li>"- I can build a program that follows my design</li> <li>- I can evaluate the steps I followed when building my project</li> <li>- I can refine the algorithm in my design"</li> </ul>

<b>Key Questions</b>	<ul style="list-style-type: none"> <li>• How is a programme started?</li> <li>• How can the outcome of a sequence be changed?</li> <li>• How is a sequence of blocks constructed?</li> <li>• How do you change the background?</li> <li>• What does a sequence do?</li> <li>• What does the word “debug” mean?</li> </ul>	<ul style="list-style-type: none"> <li>• What is the relationship between an event and an action?</li> <li>• How can movement be programmed?</li> <li>• What is a programming extension?</li> <li>• What additional features could be used in a program?</li> <li>• What does the term “modify” mean?</li> <li>• What needs to be considered when creating a maze-based challenge?</li> </ul>	<ul style="list-style-type: none"> <li>• How can a cup of tea be made?</li> <li>• When might an infinite loop be used?</li> <li>• How can an action be repeated for an object?</li> <li>• What parts of a loop can be changed?</li> <li>• Can you identify repetition in the sequence?</li> <li>• What aspect of your project could be refined?</li> </ul>
<b>Vocabulary</b>	sequence, command, program, run, start, outcome, predict, blocks, design, actions, sprite, project, modify, change, algorithm, build, match, compare, debug, features, evaluate, decomposition, code.	motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, action, debugging, errors, setup, code, test, debug, actions.	Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify, design, algorithm, debug, refine, evaluate.



## Year 4 - Computing systems and networks (The Internet)

	Prior Learning (Yr 3)	New Learning (Yr 4)	Future Learning (Yr 5)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>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</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>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</li> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>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</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>"- I can explain that digital devices accept inputs</li> <li>- I can explain that digital devices produce outputs</li> <li>- I can follow a process"</li> <li>"- I can classify input and output devices</li> <li>- I can describe a simple process</li> <li>- I can design a digital device"</li> <li>"- I can explain how I use digital devices for different activities</li> <li>- I can recognise similarities between using digital devices and non-digital tools</li> <li>- I can suggest differences between using digital devices and non-digital tools"</li> <li>"- I can discuss why we need a network switch</li> <li>- I can explain how messages are passed through multiple connections</li> <li>- I can recognise different connections"</li> <li>"- I can demonstrate how information can be passed between devices</li> <li>- I can explain the role of a switch, server, and wireless access point in a network</li> <li>- I can recognise that a computer network is made up of a number of devices"</li> <li>"- I can identify how devices in a network are connected together</li> <li>- I can identify networked devices around me</li> <li>- I can identify the benefits of computer networks"</li> </ul>	<ul style="list-style-type: none"> <li>"- I can demonstrate how information is shared across the internet</li> <li>- I can describe the internet as a network of networks</li> <li>- I can discuss why a network needs protecting"</li> <li>"- I can describe networked devices and how they connect</li> <li>- I can explain that the internet is used to provide many services</li> <li>- I can recognise that the World Wide Web contains websites and web pages"</li> <li>"- I can describe how to access websites on the WWW</li> <li>- I can describe where websites are stored when uploaded to the WWW</li> <li>- I can explain the types of media that can be shared on the WWW"</li> <li>"- I can explain that internet services can be used to create content online</li> <li>- I can explain what media can be found on websites</li> <li>- I can recognise that I can add content to the WWW"</li> <li>"- I can explain that there are rules to protect content</li> <li>- I can explain that websites and their content are created by people</li> <li>- I can suggest who owns the content on websites "</li> <li>"- I can explain that not everything on the World Wide Web is true</li> <li>- I can explain why I need to think carefully before I share or reshare content</li> </ul>	<ul style="list-style-type: none"> <li>I can describe that a computer system features inputs, processes, and outputs</li> <li>I can explain that computer systems communicate with other devices</li> <li>I can explain that systems are built using a number of parts"</li> <li>"- I can explain the benefits of a given computer system</li> <li>- I can identify tasks that are managed by computer systems</li> <li>- I can identify the human elements of a computer system"</li> <li>"- I can compare results from different search engines</li> <li>- I can make use of a web search to find specific information</li> <li>- I can refine my web search"</li> <li>"- I can explain why we need tools to find things online</li> <li>I can recognise the role of web crawlers in creating an index</li> <li>- I can relate a search term to the search engine's index"</li> <li>I can explain that a search engine follows rules to rank results</li> <li>I can give examples of criteria used by search engines to rank results</li> <li>I can order a list by rank"</li> <li>I can describe some of the ways that search results can be influenced</li> <li>- I can explain how search engines make money</li> <li>- I can recognise some of the limitations of search engines</li> </ul>

		<ul style="list-style-type: none"> <li>- I can explain why some information I find online may not be honest, accurate, or legal"</li> </ul>	
<b>Key Questions</b>	<ul style="list-style-type: none"> <li>What is an input and an output?</li> <li>How can we classify input and output devices?</li> <li>What are the similarities and differences between a digital and non-digital tool?</li> <li>What is a computer network?</li> <li>How can information be passed between devices?</li> <li>Can you identify a network of devices within school?</li> </ul>	<ul style="list-style-type: none"> <li>Why does a network need protection?</li> <li>Name 3 services the internet provides?</li> <li>What types of media can be shared to the WWW?</li> <li>How can content be added to the WWW?</li> <li>What rules protect content found online?</li> <li>Is everything on the WWW true?</li> </ul>	<ul style="list-style-type: none"> <li>Name an input, process and output of a computer system?</li> <li>What tasks can be managed by a computer system?</li> <li>How can a web search be refined?</li> <li>What is an "index"</li> <li>Give 3 examples of criteria used by search engines?</li> <li>What is a limitation of a search engine?</li> </ul>
<b>Vocabulary</b>	digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets	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, sharing, ownership, permission, information, accurate, honest, content, adverts	system, connection, digital, input, process, storage, output, search, search engine, refine, index, bot, ordering, links, algorithm, search engine optimisation (SEO), web crawler, content creator, selection, ranking.

## Year 4 - Creating media (Audio production)

	Prior Learning (Yr 3)	New Learning (Yr 4)	Future Learning (Yr 5)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>"- I can create an effective flip book—style animation</li> <li>- I can draw a sequence of pictures</li> <li>- I can explain how an animation/flip book works"</li> <li>"- I can create an effective stop-frame animation</li> <li>- I can explain why little changes are needed for each frame</li> <li>- I can predict what an animation will look like"</li> <li>"- I can break down a story into settings, characters and events</li> <li>- I can create a storyboard</li> <li>- I can describe an animation that is achievable on screen"</li> <li>"- I can evaluate the quality of my animation</li> <li>- I can review a sequence of frames to check my work</li> <li>- I can use onion skinning to help me make small changes between frames"</li> <li>"- I can evaluate another learner’s animation</li> <li>- I can explain ways to make my animation better</li> <li>- I can improve my animation based on feedback"</li> <li>"- I can add other media to my animation</li> <li>- I can evaluate my final film</li> <li>- I can explain why I added other media to my animation"</li> </ul>	<ul style="list-style-type: none"> <li>I can explain that the person who records the sound can say who is allowed to use it</li> <li>- I can identify the input and output devices used to record and play sound</li> <li>- I can use a computer to record audio"</li> <li>"- I can discuss what sounds can be added to a podcast</li> <li>- I can inspect the soundwave view to know where to trim my recording</li> <li>- I can re-record my voice to improve my recording"</li> <li>"- I can explain how sounds can be combined to make a podcast more engaging</li> <li>- I can plan appropriate content for a podcast</li> <li>- I can save my project so the different parts remain editable"</li> <li>"- I can improve my voice recordings</li> <li>- I can record content following my plan</li> <li>- I can review the quality of my recordings"</li> <li>"- I can arrange multiple sounds to create the effect I want</li> <li>- I can explain the difference between saving a project and exporting an audio file</li> <li>- I can open my project to continue working on it"</li> <li>"- I can choose appropriate edits to improve my podcast</li> <li>- I can listen to an audio recording to identify its strengths</li> <li>- I can suggest improvements to an audio recording"</li> </ul>	<ul style="list-style-type: none"> <li>"- I can compare features in different videos</li> <li>- I can explain that video is a visual media format</li> <li>- I can identify features of videos"</li> <li>"- I can experiment with different camera angles</li> <li>- I can identify and find features on a digital video recording device</li> <li>- I can make use of a microphone"</li> <li>"- I can capture video using a range of filming techniques</li> <li>- I can review how effective my video is</li> <li>- I can suggest filming techniques for a given purpose"</li> <li>"- I can create and save video content</li> <li>- I can decide which filming techniques I will use</li> <li>- I can outline the scenes of my video"</li> <li>"- I can explain how to improve a video by reshooting and editing</li> <li>- I can select the correct tools to make edits to my video</li> <li>- I can store, retrieve, and export my recording to a computer"</li> <li>"- I can evaluate my video and share my opinions</li> <li>- I can make edits to my video and improve the final outcome</li> <li>- I can recognise that my choices when making a video will impact on the quality of the final outcome"</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li><b>What is an animation?</b></li> <li><b>What is a frame?</b></li> <li><b>What are the 3 components of a story?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>What input and output devices are required to record and play sound?</b></li> <li><b>What is a soundwave and how can it be trimmed?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>What is a “visual media format”?</b></li> <li><b>Identify 3 features of a digital video recording device?</b></li> <li><b>Name 3 types of filming techniques?</b></li> </ul>

	<ul style="list-style-type: none"> <li>• What is the process of onion skinning?</li> <li>• What makes a good animation?</li> <li>• What other media could be added to an animation?</li> </ul>	<ul style="list-style-type: none"> <li>• How can a podcast be recorded to remain editable</li> <li>• Why is it to follow a plan when recording a podcast?</li> <li>• What is the difference between saving and exporting an audio file?</li> <li>• What improvements would you make to your podcast for next time?</li> </ul>	<ul style="list-style-type: none"> <li>• How can I create and save video content?</li> <li>• What is meant by the term “reshoot and edit”?</li> <li>• What would you change in your next video?</li> </ul>
<b>Vocabulary</b>	animation, flip book, stopframe, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition.	audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback.	video, audio, camera, talking head, panning, close up, video camera, microphone, lens, mid-range, long shot, moving subject, side by side, angle (high, low, normal), static, zoom, pan, tilt, storyboard, filming, review, import, split, trim, clip, edit, reshoot, delete, reorder, export, evaluate, share.

## Year 4 - Programming A (Repetition in shapes)

	Prior Learning (Yr 3)	New Learning (Yr 4)	Future Learning (Yr 5)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>" -I can explain that objects in Scratch have attributes (linked to)</li> <li>- I can identify the objects in a Scratch project (sprites, backdrops)</li> <li>- I can recognise that commands in Scratch are represented as blocks"</li> <li>" -I can choose a word which describes an on-screen action for my plan</li> <li>- I can create a program following a design</li> <li>- I can identify that each sprite is controlled by the commands I choose"</li> <li>" -I can create a sequence of connected commands</li> <li>- I can explain that the objects in my project will respond exactly to the code</li> <li>- I can start a program in different ways"</li> <li>" -I can combine sound commands</li> <li>- I can explain what a sequence is</li> <li>- I can order notes into a sequence"</li> <li>" -I can build a sequence of commands</li> <li>- I can decide the actions for each sprite in a program</li> <li>- I can make design choices for my artwork"</li> <li>" -I can identify and name the objects I will need for a project</li> <li>- I can implement my algorithm as code</li> <li>- I can relate a task description to a design"</li> </ul>	<ul style="list-style-type: none"> <li>I can create a code snippet for a given purpose</li> <li>- I can explain the effect of changing a value of a command</li> <li>- I can program a computer by typing commands"</li> <li>" -I can test my algorithm in a text-based language</li> <li>- I can use a template to create a design for my program</li> <li>- I can write an algorithm to produce a given outcome"</li> <li>" -I can identify everyday tasks that include repetition as part of a sequence, eg brushing teeth, dance moves</li> <li>- I can identify patterns in a sequence</li> <li>- I can use a count-controlled loop to produce a given outcome"</li> <li>" -I can choose which values to change in a loop</li> <li>- I can identify the effect of changing the number of times a task is repeated</li> <li>- I can predict the outcome of a program containing a count-controlled loop"</li> <li>" -I can explain that a computer can repeatedly call a procedure</li> <li>- I can identify 'chunks' of actions in the real world</li> <li>- I can use a procedure in a program"</li> <li>" -I can design a program that includes count-controlled loops</li> <li>- I can develop my program by debugging it</li> <li>- I can make use of my design to write a program"</li> </ul>	<ul style="list-style-type: none"> <li>" -I can create a simple circuit and connect it to a microcontroller</li> <li>- I can explain what an infinite loop does</li> <li>- I can program a microcontroller to make an LED switch on"</li> <li>" -I can connect more than one output component to a microcontroller</li> <li>- I can design sequences that use count-controlled loops</li> <li>- I can use a count-controlled loop to control outputs"</li> <li>" -I can design a conditional loop</li> <li>- I can explain that a condition is either true or false</li> <li>- I can program a microcontroller to respond to an input"</li> <li>" -I can explain that a condition being met can start an action</li> <li>- I can identify a condition and an action in my project</li> <li>- I can use selection (an 'if...then...' statement) to direct the flow of a program"</li> <li>" -I can create a detailed drawing of my project</li> <li>- I can describe what my project will do</li> <li>- I can identify a real-world example of a condition starting an action"</li> <li>" -I can test and debug my project</li> <li>- I can use selection to produce an intended outcome</li> <li>- I can write an algorithm that describes what my model will do"</li> </ul>

<b>Key Questions</b>	<ul style="list-style-type: none"> <li>• What is a sprite?</li> <li>• What does a command do?</li> <li>• What is code?</li> <li>• How can sound commands be added to a project?</li> <li>• How can a sprite be edited?</li> <li>• Why is a task description important?</li> </ul>	<ul style="list-style-type: none"> <li>• What effect can changing the value of a command have?</li> <li>• Define “text-based language”?</li> <li>• Name 3 everyday tasks that include repetition?</li> <li>• What is meant by a “loop”?</li> <li>• What does a computer do when it repeatedly calls a procedure?</li> <li>• What does a “count-controlled” loop do?</li> </ul>	<ul style="list-style-type: none"> <li>• What is an infinite loop?</li> <li>• What is a count-controlled loop?</li> <li>• What is a conditional loop?</li> <li>• Can you identify a condition and an action in your project?</li> <li>• Can you identify a condition starting an action in the real world?</li> <li>• How can you test for issues in a project?</li> </ul>
<b>Vocabulary</b>	Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task, design, run the code, order, note, chord, algorithm, bug, debug, code	Logo (programming environment), program, turtle, commands, code snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled loop, value, trace, decompose, procedure.	microcontroller, USB, components, connection, infinite loop, output component, motor, repetition, count-controlled loop, Crumble controller, switch, LED, Sparkle, crocodile clips, connect, battery box, program, condition, Input, output, selection, action, debug, circuit, power, cell, buzzer

## Year 4 - Data and information (Data logging)

	Prior Learning (Yr 3)	New Learning (Yr 4)	Future Learning (Yr 5)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>"-I can create two groups of objects separated by one attribute</li> <li>- I can investigate questions with yes/no answers</li> <li>- I can make up a yes/no question about a collection of objects"</li> <li>"-I can arrange objects into a tree structure</li> <li>- I can create a group of objects within an existing group</li> <li>- I can select an attribute to separate objects into groups"</li> <li>"-I can group objects using my own yes/no questions</li> <li>- I can select objects to arrange in a branching database</li> <li>- I can test my branching database to see if it works"</li> <li>"-I can compare two branching database structures</li> <li>- I can create yes/no questions using given attributes</li> <li>- I can explain that questions need to be ordered carefully to split objects into similarly sized groups"</li> <li>"-I can create a physical version of a branching database</li> <li>- I can create questions that will enable objects to be uniquely identified</li> <li>- I can independently create questions to use in a branching database "</li> <li>"-I can create a branching database that reflects my plan</li> <li>- I can suggest real-world uses for branching databases</li> <li>- I can work with a partner to test my identification tool"</li> </ul>	<ul style="list-style-type: none"> <li>I can choose a data set to answer a given question</li> <li>- I can identify data that can be gathered over time</li> <li>- I can suggest questions that can be answered using a given data set"</li> <li>"-I can explain what data can be collected using sensors</li> <li>- I can identify that data from sensors can be recorded</li> <li>- I can use data from a sensor to answer a given question"</li> <li>"-I can identify the intervals used to collect data</li> <li>- I can recognise that a data logger collects data at given points</li> <li>- I can talk about the data that I have captured"</li> <li>"-I can explain that there are different ways to view data</li> <li>- I can sort data to find information</li> <li>- I can view data at different levels of detail"</li> <li>"-I can plan how to collect data using a data logger</li> <li>- I can propose a question that can be answered using logged data</li> <li>- I can use a data logger to collect data"</li> <li>"-I can draw conclusions from the data that I have collected</li> <li>- I can explain the benefits of using a data logger</li> <li>- I can interpret data that has been collected using a data logger"</li> </ul>	<ul style="list-style-type: none"> <li>"-I can create a database using cards</li> <li>- I can explain how information can be recorded</li> <li>- I can order, sort, and group my data cards"</li> <li>"-I can choose which field to sort data by to answer a given question</li> <li>- I can explain what a field and a record is in a database</li> <li>- I can navigate a flat-file database to compare different views of information"</li> <li>"-I can combine grouping and sorting to answer specific questions</li> <li>- I can explain that data can be grouped using chosen values</li> <li>- I can group information using a database"</li> <li>"-I can choose multiple criteria to answer a given question</li> <li>- I can choose which field and value are required to answer a given question</li> <li>- I can outline how 'AND' and 'OR' can be used to refine data selection"</li> <li>"-I can explain the benefits of using a computer to create charts</li> <li>- I can refine a chart by selecting a particular filter</li> <li>- I can select an appropriate chart to visually compare data"</li> <li>"-I can ask questions that will need more than one field to answer</li> <li>- I can present my findings to a group</li> <li>- I can refine a search in a real-world context "</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li><b>Why does data need to be sorted?</b></li> <li><b>What does a tree structure allow us to do with data?</b></li> <li><b>How can we test a branching database?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Name 3 types of data that can be gathered over time?</b></li> <li><b>What type of data can be collected using a sensor?</b></li> <li><b>What is a data logger and what data can it collect?</b></li> <li><b>Name 3 ways to view data?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Name 3 methods of recording data?</b></li> <li><b>Define a "field" and a "record" is in a database?</b></li> <li><b>What is the difference between grouping and sorting?</b></li> </ul>

	<ul style="list-style-type: none"> <li>• Why does a branching database need to be well structured?</li> <li>• What question could you ask to separate mammals and birds?</li> <li>• Where would you find a branching database in the real world?</li> </ul>	<ul style="list-style-type: none"> <li>• How could a data logger be used to collect the temperature in a room throughout the day?</li> <li>• What are the benefits of using a data logger?</li> </ul>	<ul style="list-style-type: none"> <li>• How can "AND" and "OR" be used to refine data selection?</li> <li>• What are the benefits of using a computer to create charts?</li> <li>• Can you refine a search in a real-world context?</li> </ul>
<b>Vocabular</b> <b>y</b>	attribute, value, questions, table, objects, branching, database, objects, equal, even, separate, structure, compare, order, organise, selecting, information, decision tree.	data, table, layout, input device, sensor, logger, logging, data point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.	database, data, information, record, field, sort, order, group, search, value, criteria, graph, chart, axis, compare, filter, presentation



## Year 4 - Creating media (Photo editing)

	Prior Learning (Yr 3)	New Learning (Yr 4)	Future Learning (Yr 5)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>● use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>● select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>● use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>● select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>● use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>● select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>● "- I can explain the difference between text and images</li> <li>● - I can identify the advantages and disadvantages of using text and images</li> <li>● - I can recognise that text and images can communicate messages clearly"</li> <li>● "- I can change font style, size, and colours for a given purpose</li> <li>● - I can edit text</li> <li>● - I can explain that text can be changed to communicate more clearly"</li> <li>● "- I can create a template for a particular purpose</li> <li>● - I can define the term 'page orientation'</li> <li>● - I can recognise placeholders and say why they are important"</li> <li>● "- I can choose the best locations for my content</li> <li>● - I can make changes to content after I've added it</li> <li>● - I can paste text and images to create a magazine cover"</li> <li>● "- I can choose a suitable layout for a given purpose</li> <li>● - I can identify different layouts</li> <li>● - I can match a layout to a purpose"</li> <li>● "- I can compare work made on desktop publishing to work created by hand</li> <li>● - I can identify the uses of desktop publishing in the real world</li> <li>● - I can say why desktop publishing might be helpful"</li> </ul>	<ul style="list-style-type: none"> <li>● I can explain why I might crop an image</li> <li>● I can improve an image by rotating it</li> <li>● I can use photo editing software to crop an image</li> <li>● I can experiment with different colour effects</li> <li>● I can explain that different colour effects make you think and feel different things</li> <li>● I can explain why I chose certain colour effects"</li> <li>● I can add to the composition of an image by cloning</li> <li>● I can identify how a photo edit can be improved</li> <li>● I can remove parts of an image using cloning"</li> <li>● I can experiment with tools to select and copy part of an image</li> <li>● I can explain why photos might be edited</li> <li>● I can use a range of tools to copy between images"</li> <li>● I can choose suitable images for my project</li> <li>● I can create a project that is a combination of other images</li> <li>● I can describe the image I want to create"</li> <li>● I can combine text and my image to complete the project</li> <li>● I can review images against a given criteria</li> <li>● I can use feedback to guide making changes"</li> </ul>	<ul style="list-style-type: none"> <li>● I can discuss how vector drawings are different from paper-based drawings</li> <li>● I can experiment with the shape and line tools</li> <li>● I can recognise that vector drawings are made using shapes"</li> <li>● I can explain that each element added to a vector drawing is an object</li> <li>● I can identify the shapes used to make a vector drawing</li> <li>● I can move, resize, and rotate objects I have duplicated"</li> <li>● I can explain how alignment grids and resize handles can be used to improve consistency</li> <li>● I can modify objects to create a new image</li> <li>● I can use the zoom tool to help me add detail to my drawings"</li> <li>● I can change the order of layers in a vector drawing</li> <li>● I can identify that each added object creates a new layer in the drawing</li> <li>● I can use layering to create an image"</li> <li>● I can copy part of a drawing by duplicating several objects</li> <li>● I can recognise when I need to group and ungroup objects</li> <li>● I can reuse a group of objects to further develop my vector drawing"</li> <li>● I can compare vector drawings to freehand paint drawings</li> <li>● I can create a vector drawing for a specific purpose</li> <li>● I can reflect on the skills I have used and why I have used them"</li> </ul>

<b>Key Questions</b>	<ul style="list-style-type: none"> <li>• What is the difference between text and image?</li> <li>• Give an example of when text would need to be communicated more clearly?</li> <li>• Define the term “page orientation”?</li> <li>• What does the word content mean?</li> <li>• Why is the layout of a page important for the purpose of the piece?</li> <li>• Where is desktop publishing used in the real world?</li> </ul>	<ul style="list-style-type: none"> <li>• Why might an image need to be cropped?</li> <li>• How can the colour effects on an image affect how it is perceived?</li> <li>• What does cloning mean?</li> <li>• Why might photos be edited?</li> <li>• How can we ensure that images are suitable for a project?</li> <li>• How can text be added to an image?</li> </ul>	<ul style="list-style-type: none"> <li>• What is the difference between a vector drawing and a paper-based drawing?</li> <li>• How can an object be moved, resized and rotated?</li> <li>• Name 2 ways that consistency can be improved when creating a vector drawing?</li> <li>• What is a “layer” within a vector drawing?</li> <li>• What does grouping and ungrouping a series of objects do?</li> <li>• Why might a vector drawing be used?</li> </ul>
<b>Vocabulary</b>	text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits	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.	vector, drawing tools, object, toolbar, vector drawing, move, resize, colour, rotate, duplicate/copy, zoom, select, align, modify, layers, order, copy, paste, group, ungroup, reuse, reflection

## Year 4 - Programming B (Repetition in games)

	Prior Learning (Yr 3)	New Learning (Yr 4)	Future Learning (Yr 5)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>"- I can choose which keys to use for actions and explain my choices</li> <li>- I can explain the relationship between an event and an action</li> <li>- I can identify a way to improve a program"</li> <li>"- I can choose a character for my project</li> <li>- I can choose a suitable size for a character in a maze</li> <li>- I can program movement"</li> <li>"- I can choose blocks to set up my program</li> <li>- I can consider the real world when making design choices</li> <li>- I can use a programming extension"</li> <li>"- I can build more sequences of commands to make my design work</li> <li>- I can choose suitable keys to turn on additional features</li> <li>- I can identify additional features (from a given set of blocks)"</li> <li>"- I can match a piece of code to an outcome</li> <li>- I can modify a program using a design</li> <li>- I can test a program against a given design"</li> <li>"- I can evaluate my project</li> <li>- I can implement my design</li> <li>- I can make design choices and justify them"</li> </ul>	<ul style="list-style-type: none"> <li>"- I can list an everyday task as a set of instructions including repetition</li> <li>- I can modify a snippet of code to create a given outcome</li> <li>- I can predict the outcome of a snippet of code"</li> <li>"- I can choose when to use a count-controlled and an infinite loop</li> <li>- I can modify loops to produce a given outcome</li> <li>- I can recognise that some programming languages enable more than one process to be run at once"</li> <li>"- I can choose which action will be repeated for each object</li> <li>- I can evaluate the effectiveness of the repeated sequences used in my program</li> <li>- I can explain what the outcome of the repeated action should be"</li> <li>"- I can explain the effect of my changes</li> <li>- I can identify which parts of a loop can be changed</li> <li>- I can re-use existing code snippets on new sprites"</li> <li>"- I can develop my own design explaining what my project will do</li> <li>- I can evaluate the use of repetition in a project</li> <li>- I can select key parts of a given project to use in my own design"</li> <li>"- I can build a program that follows my design</li> <li>- I can evaluate the steps I followed when building my project</li> <li>- I can refine the algorithm in my design"</li> </ul>	<ul style="list-style-type: none"> <li>"- I can identify conditions in a program</li> <li>- I can modify a condition in a program</li> <li>- I can recall how conditions are used in selection"</li> <li>"- I can create a program with different outcomes using selection</li> <li>- I can identify the condition and outcomes in an 'if... then... else...' statement</li> <li>- I can use selection in an infinite loop to check a condition"</li> <li>"- I can design the flow of a program which contains 'if... then... else...'"</li> <li>- I can explain that program flow can branch according to a condition</li> <li>- I can show that a condition can direct program flow in one of two ways"</li> <li>"- I can identify the outcome of user input in an algorithm</li> <li>- I can outline a given task</li> <li>- I can use a design format to outline my project"</li> <li>"- I can implement my algorithm to create the first section of my program</li> <li>- I can share my program with others</li> <li>- I can test my program"</li> <li>"- I can extend my program further</li> <li>- I can identify the setup code I need in my program</li> <li>- I can identify ways the program could be improved"</li> </ul>

<b>Key Questions</b>	<ul style="list-style-type: none"> <li>• What is the relationship between an event and an action?</li> <li>• How can movement be programmed?</li> <li>• What is a programming extension?</li> <li>• What additional features could be used in a program?</li> <li>• What does the term "modify" mean?</li> <li>• What needs to be considered when creating a maze-based challenge?</li> </ul>	<ul style="list-style-type: none"> <li>• How can a cup of tea be made?</li> <li>• When might an infinite loop be used?</li> <li>• How can an action be repeated for an object?</li> <li>• What parts of a loop can be changed?</li> <li>• Can you identify repetition in the sequence?</li> <li>• What aspect of your project could be refined?</li> </ul>	<ul style="list-style-type: none"> <li>• How can a condition be modified?</li> <li>• Define how the following can change an outcome: if / then / else</li> <li>• Explain what a program flow is?</li> <li>• What effect does user input have on an outcome?</li> <li>• How can a program be tested?</li> <li>• What could be added to a program to extend it?</li> </ul>
<b>Vocabulary</b>	motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, action, debugging, errors, setup, code, test, debug, actions.	Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify, design, algorithm, debug, refine, evaluate.	Selection, condition, true, false, count-controlled loop, outcomes, conditional statement, algorithm, program, debug, question, answer, task, design, input, implement, test, run, setup, operator

## Year 5 - Computing systems and networks (Systems and searching)

	Prior Learning (Yr 4)	New Learning (Yr 5)	Future Learning (Yr 6)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>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</li> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>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</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>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</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>"- I can demonstrate how information is shared across the internet</li> <li>- I can describe the internet as a network of networks</li> <li>- I can discuss why a network needs protecting"</li> <li>"- I can describe networked devices and how they connect</li> <li>- I can explain that the internet is used to provide many services</li> <li>- I can recognise that the World Wide Web contains websites and web pages"</li> <li>"- I can describe how to access websites on the WWW</li> <li>- I can describe where websites are stored when uploaded to the WWW</li> <li>- I can explain the types of media that can be shared on the WWW"</li> <li>"- I can explain that internet services can be used to create content online</li> <li>- I can explain what media can be found on websites</li> <li>- I can recognise that I can add content to the WWW"</li> <li>"- I can explain that there are rules to protect content</li> <li>- I can explain that websites and their content are created by people</li> <li>- I can suggest who owns the content on websites "</li> <li>"- I can explain that not everything on the World Wide Web is true</li> <li>- I can explain why I need to think carefully before I share or reshare content</li> </ul>	<ul style="list-style-type: none"> <li>I can describe that a computer system features inputs, processes, and outputs</li> <li>I can explain that computer systems communicate with other devices</li> <li>I can explain that systems are built using a number of parts"</li> <li>"- I can explain the benefits of a given computer system</li> <li>- I can identify tasks that are managed by computer systems</li> <li>- I can identify the human elements of a computer system"</li> <li>"- I can compare results from different search engines</li> <li>- I can make use of a web search to find specific information</li> <li>- I can refine my web search"</li> <li>"- I can explain why we need tools to find things online</li> <li>I can recognise the role of web crawlers in creating an index</li> <li>- I can relate a search term to the search engine's index"</li> <li>I can explain that a search engine follows rules to rank results</li> <li>I can give examples of criteria used by search engines to rank results</li> <li>I can order a list by rank"</li> <li>I can describe some of the ways that search results can be influenced</li> <li>- I can explain how search engines make money</li> <li>- I can recognise some of the limitations of search engines</li> </ul>	<ul style="list-style-type: none"> <li>"- I can describe how computers use addresses to access websites</li> <li>- I can explain that internet devices have addresses</li> <li>- I can recognise that data is transferred using agreed methods "</li> <li>"- I can explain that all data transferred over the internet is in packets</li> <li>- I can explain that data is transferred over networks in packets</li> <li>- I can identify and explain the main parts of a data packet"</li> <li>"- I can explain that the internet allows different media to be shared</li> <li>- I can recognise how to access shared files stored online</li> <li>- I can send information over the internet in different ways"</li> <li>"- I can explain how the internet enables effective collaboration</li> <li>- I can identify different ways of working together online</li> <li>- I can recognise that working together on the internet can be public or private"</li> <li>"- I can choose methods of communication to suit particular purposes</li> <li>- I can explain the different ways in which people communicate</li> <li>- I can identify that there are a variety of ways to communicate over the internet"</li> <li>"- I can compare different methods of communicating on the internet</li> </ul>

	<ul style="list-style-type: none"> <li>- I can explain why some information I find online may not be honest, accurate, or legal"</li> </ul>		<ul style="list-style-type: none"> <li>- I can decide when I should and should not share information online</li> <li>- I can explain that communication on the internet may not be private"</li> <li></li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li>Why does a network need protection?</li> <li>Name 3 services the internet provides?</li> <li>What types of media can be shared to the WWW?</li> <li>How can content be added to the WWW?</li> <li>What rules protect content found online?</li> <li>Is everything on the WWW true?</li> </ul>	<ul style="list-style-type: none"> <li>Name an input, process and output of a computer system?</li> <li>What tasks can be managed by a computer system?</li> <li>How can a web search be refined?</li> <li>What is an "index"</li> <li>Give 3 examples of criteria used by search engines?</li> <li>What is a limitation of a search engine?</li> </ul>	<ul style="list-style-type: none"> <li>What is a website address and what does it do?</li> <li>What is a packet?</li> <li>Name 3 ways information can be sent over the internet?</li> <li>What is the difference between working together publicly or privately?</li> <li>Name 3 ways to communicate and what you would use each one for?</li> <li>When is a safe time to share information over the internet?</li> </ul>
<b>Vocabulary</b>	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, sharing, ownership, permission, information, accurate, honest, content, adverts	system, connection, digital, input, process, storage, output, search, search engine, refine, index, bot, ordering, links, algorithm, search engine optimisation (SEO), web crawler, content creator, selection, ranking.	communication, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, oneway, two-way, one-to-one, one-to-many.

## Year 5 - Creating media (Video production)

	Prior Learning (Yr 4)	New Learning (Yr 5)	Future Learning (Yr 6)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>I can explain that the person who records the sound can say who is allowed to use it</li> <li>- I can identify the input and output devices used to record and play sound</li> <li>- I can use a computer to record audio"</li> <li>" - I can discuss what sounds can be added to a podcast</li> <li>- I can inspect the soundwave view to know where to trim my recording</li> <li>- I can re-record my voice to improve my recording"</li> <li>" - I can explain how sounds can be combined to make a podcast more engaging</li> <li>- I can plan appropriate content for a podcast</li> <li>- I can save my project so the different parts remain editable"</li> <li>" - I can improve my voice recordings</li> <li>- I can record content following my plan</li> <li>- I can review the quality of my recordings"</li> <li>" - I can arrange multiple sounds to create the effect I want</li> <li>- I can explain the difference between saving a project and exporting an audio file</li> <li>- I can open my project to continue working on it"</li> <li>" - I can choose appropriate edits to improve my podcast</li> <li>- I can listen to an audio recording to identify its strengths</li> <li>- I can suggest improvements to an audio recording"</li> </ul>	<ul style="list-style-type: none"> <li>" - I can compare features in different videos</li> <li>- I can explain that video is a visual media format</li> <li>- I can identify features of videos"</li> <li>" - I can experiment with different camera angles</li> <li>- I can identify and find features on a digital video recording device</li> <li>- I can make use of a microphone"</li> <li>" - I can capture video using a range of filming techniques</li> <li>- I can review how effective my video is</li> <li>- I can suggest filming techniques for a given purpose"</li> <li>" - I can create and save video content</li> <li>- I can decide which filming techniques I will use</li> <li>- I can outline the scenes of my video"</li> <li>" - I can explain how to improve a video by reshooting and editing</li> <li>- I can select the correct tools to make edits to my video</li> <li>- I can store, retrieve, and export my recording to a computer"</li> <li>" - I can evaluate my video and share my opinions</li> <li>- I can make edits to my video and improve the final outcome</li> <li>- I can recognise that my choices when making a video will impact on the quality of the final outcome"</li> </ul>	<ul style="list-style-type: none"> <li>I can discuss the different types of media used on websites</li> <li>- I can explore a website</li> <li>- I know that websites are written in HTML"</li> <li>" - I can draw a web page layout that suits my purpose</li> <li>- I can recognise the common features of a web page</li> <li>- I can suggest media to include on my page"</li> <li>" - I can describe what is meant by the term 'fair use'</li> <li>- I can find copyright-free images</li> <li>- I can say why I should use copyright-free images"</li> <li>" - I can add content to my own web page</li> <li>- I can evaluate what my web page looks like on different devices and suggest/make edits</li> <li>- I can preview what my web page looks like"</li> <li>" - I can describe why navigation paths are useful</li> <li>- I can explain what a navigation path is</li> <li>- I can make multiple web pages and link them using hyperlinks"</li> <li>" - I can create hyperlinks to link to other people's work</li> <li>- I can evaluate the user experience of a website</li> <li>- I can explain the implication of linking to content owned by others"</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li><b>What input and output devices are required to record and play sound?</b></li> <li><b>What is a soundwave and how can it be trimmed?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>What is a "visual media format"?</b></li> <li><b>Identify 3 features of a digital video recording device?</b></li> <li><b>Name 3 types of filming techniques?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Name 3 types of media used on websites?</b></li> <li><b>What are the common features of a web page?</b></li> <li><b>What is meant by the term "fair use"?</b></li> </ul>

	<ul style="list-style-type: none"> <li>• How can a podcast be recorded to remain editable</li> <li>• Why is it to follow a plan when recording a podcast?</li> <li>• What is the difference between saving and exporting an audio file?</li> <li>• What improvements would you make to your podcast for next time?</li> </ul>	<ul style="list-style-type: none"> <li>• How can I create and save video content?</li> <li>• What is meant by the term "reshoot and edit"?</li> <li>• What would you change in your next video?</li> </ul>	<ul style="list-style-type: none"> <li>• What might change when looking at the same website on different devices?</li> <li>• What is a navigation path?</li> <li>• What is a hyperlink?</li> </ul>
<b>Vocabulary</b>	audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback.	video, audio, camera, talking head, panning, close up, video camera, microphone, lens, mid-range, long shot, moving subject, side by side, angle (high, low, normal), static, zoom, pan, tilt, storyboard, filming, review, import, split, trim, clip, edit, reshoot, delete, reorder, export, evaluate, share.	website, web page, browser, media, Hypertext Markup Language (HTML), logo, layout, header, media, purpose, copyright, fair use, home page, preview, evaluate, device, Google Sites, breadcrumb trail, navigation, hyperlink, subpage, evaluate, implication, external link, embed.



## Year 5 - Programming A (Selection in physical computing)

	Prior Learning (Yr 4)	New Learning (Yr 5)	Future Learning (Yr 6)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>I can create a code snippet for a given purpose</li> <li>- I can explain the effect of changing a value of a command</li> <li>- I can program a computer by typing commands"</li> <li>" -I can test my algorithm in a text-based language</li> <li>- I can use a template to create a design for my program</li> <li>- I can write an algorithm to produce a given outcome"</li> <li>" -I can identify everyday tasks that include repetition as part of a sequence, eg brushing teeth, dance moves</li> <li>- I can identify patterns in a sequence</li> <li>- I can use a count-controlled loop to produce a given outcome"</li> <li>" -I can choose which values to change in a loop</li> <li>- I can identify the effect of changing the number of times a task is repeated</li> <li>- I can predict the outcome of a program containing a count-controlled loop"</li> <li>" -I can explain that a computer can repeatedly call a procedure</li> <li>- I can identify 'chunks' of actions in the real world</li> <li>- I can use a procedure in a program"</li> <li>" -I can design a program that includes count-controlled loops</li> <li>- I can develop my program by debugging it</li> </ul>	<ul style="list-style-type: none"> <li>" -I can create a simple circuit and connect it to a microcontroller</li> <li>- I can explain what an infinite loop does</li> <li>- I can program a microcontroller to make an LED switch on"</li> <li>" -I can connect more than one output component to a microcontroller</li> <li>- I can design sequences that use count-controlled loops</li> <li>- I can use a count-controlled loop to control outputs"</li> <li>" -I can design a conditional loop</li> <li>- I can explain that a condition is either true or false</li> <li>- I can program a microcontroller to respond to an input"</li> <li>" -I can explain that a condition being met can start an action</li> <li>- I can identify a condition and an action in my project</li> <li>- I can use selection (an 'if...then...' statement) to direct the flow of a program"</li> <li>" -I can create a detailed drawing of my project</li> <li>- I can describe what my project will do</li> <li>- I can identify a real-world example of a condition starting an action"</li> <li>" -I can test and debug my project</li> <li>- I can use selection to produce an intended outcome</li> </ul>	<ul style="list-style-type: none"> <li>" -I can explain that the way a variable changes can be defined</li> <li>- I can identify examples of information that is variable</li> <li>- I can identify that variables can hold numbers or letters"</li> <li>" -I can explain that a variable has a name and a value</li> <li>- I can identify a program variable as a placeholder in memory for a single value</li> <li>- I can recognise that the value of a variable can be changed"</li> <li>" -I can decide where in a program to change a variable</li> <li>- I can make use of an event in a program to set a variable</li> <li>- I can recognise that the value of a variable can be used by a program"</li> <li>" -I can choose the artwork for my project</li> <li>- I can create algorithms for my project</li> <li>- I can explain my design choices"</li> <li>" -I can choose a name that identifies the role of a variable</li> <li>- I can create the artwork for my project</li> <li>- I can test the code that I have written"</li> <li>" -I can identify ways that my game could be improved</li> <li>- I can share my game with others</li> <li>- I can use variables to extend my game"</li> </ul>

	<ul style="list-style-type: none"> <li>- I can make use of my design to write a program"</li> <li></li> </ul>	<ul style="list-style-type: none"> <li>- I can write an algorithm that describes what my model will do"</li> <li></li> </ul>	
<b>Key Questions</b>	<ul style="list-style-type: none"> <li>What effect can changing the value of a command have?</li> <li>Define "text-based language"?</li> <li>Name 3 everyday tasks that include repetition?</li> <li>What is meant by a "loop"?</li> <li>What does a computer do when it repeatedly calls a procedure?</li> <li>What does a "count-controlled" loop do?</li> </ul>	<ul style="list-style-type: none"> <li>What is an infinite loop?</li> <li>What is a count-controlled loop?</li> <li>What is a conditional loop?</li> <li>Can you identify a condition and an action in your project?</li> <li>Can you identify a condition starting an action in the real world?</li> <li>How can you test for issues in a project?</li> </ul>	<ul style="list-style-type: none"> <li>What does the term "variable" mean?</li> <li>Why might the value of a variable change?</li> <li>How can a variable's value be used in a program?</li> <li>Why are design choices important for a project?</li> <li>Why is the name given to a variable important to identify its role?</li> <li>How could you improve your game next time?</li> </ul>
<b>Vocabulary</b>	Logo (programming environment), program, turtle, commands, code snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled loop, value, trace, decompose, procedure.	microcontroller, USB, components, connection, infinite loop, output component, motor, repetition, count-controlled loop, Crumble controller, switch, LED, Sparkle, crocodile clips, connect, battery box, program, condition, Input, output, selection, action, debug, circuit, power, cell, buzzer	variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share, assign, declare

## Year 5 - Data and information (Flat-file databases)

	Prior Learning (Yr 4)	New Learning (Yr 5)	Future Learning (Yr 6)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>I can choose a data set to answer a given question</li> <li>- I can identify data that can be gathered over time</li> <li>- I can suggest questions that can be answered using a given data set"</li> <li>" -I can explain what data can be collected using sensors</li> <li>- I can identify that data from sensors can be recorded</li> <li>- I can use data from a sensor to answer a given question"</li> <li>" -I can identify the intervals used to collect data</li> <li>- I can recognise that a data logger collects data at given points</li> <li>- I can talk about the data that I have captured"</li> <li>" -I can explain that there are different ways to view data</li> <li>- I can sort data to find information</li> <li>- I can view data at different levels of detail"</li> <li>" -I can plan how to collect data using a data logger</li> <li>- I can propose a question that can be answered using logged data</li> <li>- I can use a data logger to collect data"</li> <li>" -I can draw conclusions from the data that I have collected</li> <li>- I can explain the benefits of using a data logger</li> <li>- I can interpret data that has been collected using a data logger"</li> </ul>	<ul style="list-style-type: none"> <li>" -I can create a database using cards</li> <li>- I can explain how information can be recorded</li> <li>- I can order, sort, and group my data cards"</li> <li>" -I can choose which field to sort data by to answer a given question</li> <li>- I can explain what a field and a record is in a database</li> <li>- I can navigate a flat-file database to compare different views of information"</li> <li>" -I can combine grouping and sorting to answer specific questions</li> <li>- I can explain that data can be grouped using chosen values</li> <li>- I can group information using a database"</li> <li>" -I can choose multiple criteria to answer a given question</li> <li>- I can choose which field and value are required to answer a given question</li> <li>- I can outline how 'AND' and 'OR' can be used to refine data selection"</li> <li>" -I can explain the benefits of using a computer to create charts</li> <li>- I can refine a chart by selecting a particular filter</li> <li>- I can select an appropriate chart to visually compare data"</li> <li>" -I can ask questions that will need more than one field to answer</li> <li>- I can present my findings to a group</li> <li>- I can refine a search in a real-world context "</li> </ul>	<ul style="list-style-type: none"> <li>" -I can collect data</li> <li>- I can enter data into a spreadsheet</li> <li>- I can suggest how to structure my data"</li> <li>" -I can apply an appropriate format to a cell</li> <li>- I can choose an appropriate format for a cell</li> <li>- I can explain what an item of data is"</li> <li>" -I can construct a formula in a spreadsheet</li> <li>- I can explain which data types can be used in calculations</li> <li>- I can identify that changing inputs changes outputs"</li> <li>" -I can apply a formula to multiple cells by duplicating it</li> <li>- I can calculate data using different operations</li> <li>- I can create a formula which includes a range of cells"</li> <li>" -I can apply a formula to calculate the data I need to answer questions</li> <li>- I can explain why data should be organised</li> <li>- I can use a spreadsheet to answer questions"</li> <li>" -I can produce a chart</li> <li>- I can suggest when to use a table or chart</li> <li>- I can use a chart to show the answer to questions"</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li>Name 3 types of data that can be gathered over time?</li> <li>What type of data can be collected using a sensor?</li> <li>What is a data logger and what data can it collect?</li> <li>Name 3 ways to view data?</li> </ul>	<ul style="list-style-type: none"> <li>Name 3 methods of recording data?</li> <li>Define a "field" and a "record" is in a database?</li> <li>What is the difference between grouping and sorting?</li> <li>How can "AND" and "OR" be used to refine data selection?</li> </ul>	<ul style="list-style-type: none"> <li>How can data be collected?</li> <li>What does "format" mean?</li> <li>What is a "formula" and how can it be used in a spreadsheet?</li> <li>How could I calculate the total of 5 cells?</li> </ul>

	<ul style="list-style-type: none"> <li>• How could a data logger be used to collect the temperature in a room throughout the day?</li> <li>• What are the benefits of using a data logger?</li> </ul>	<ul style="list-style-type: none"> <li>• What are the benefits of using a computer to create charts?</li> <li>• Can you refine a search in a real-world context?</li> </ul>	<ul style="list-style-type: none"> <li>• Why should data be organised?</li> <li>• How can I create a chart to show my data?</li> </ul>
<b>Vocabulary</b>	data, table, layout, input device, sensor, logger, logging, data point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.	database, data, information, record, field, sort, order, group, search, value, criteria, graph, chart, axis, compare, filter, presentation	data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, spreadsheet, input, output, operation, range, duplicate, sigma, propose, question, data set, organised, chart, evaluate, results, sum, comparison, software, tool

## Year 5 - Creating media (Introduction to vector graphics)

	Prior Learning (Yr 4)	New Learning (Yr 5)	Future Learning (Yr 6)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>I can explain why I might crop an image</li> <li>I can improve an image by rotating it</li> <li>I can use photo editing software to crop an image</li> <li>I can experiment with different colour effects</li> <li>I can explain that different colour effects make you think and feel different things</li> <li>I can explain why I chose certain colour effects"</li> <li>I can add to the composition of an image by cloning</li> <li>I can identify how a photo edit can be improved</li> <li>I can remove parts of an image using cloning"</li> <li>I can experiment with tools to select and copy part of an image</li> <li>I can explain why photos might be edited</li> <li>I can use a range of tools to copy between images"</li> <li>I can choose suitable images for my project</li> <li>I can create a project that is a combination of other images</li> <li>I can describe the image I want to create"</li> <li>I can combine text and my image to complete the project</li> <li>I can review images against a given criteria</li> <li>I can use feedback to guide making changes"</li> </ul>	<ul style="list-style-type: none"> <li>I can discuss how vector drawings are different from paper-based drawings</li> <li>I can experiment with the shape and line tools</li> <li>I can recognise that vector drawings are made using shapes"</li> <li>I can explain that each element added to a vector drawing is an object</li> <li>I can identify the shapes used to make a vector drawing</li> <li>I can move, resize, and rotate objects I have duplicated"</li> <li>I can explain how alignment grids and resize handles can be used to improve consistency</li> <li>I can modify objects to create a new image</li> <li>I can use the zoom tool to help me add detail to my drawings"</li> <li>I can change the order of layers in a vector drawing</li> <li>I can identify that each added object creates a new layer in the drawing</li> <li>I can use layering to create an image"</li> <li>I can copy part of a drawing by duplicating several objects</li> <li>I can recognise when I need to group and ungroup objects</li> <li>I can reuse a group of objects to further develop my vector drawing"</li> <li>I can compare vector drawings to freehand paint drawings</li> <li>I can create a vector drawing for a specific purpose</li> <li>I can reflect on the skills I have used and why I have used them"</li> </ul>	<ul style="list-style-type: none"> <li>" -I can add 3D shapes to a project</li> <li>- I can move 3D shapes relative to one another</li> <li>- I can view 3D shapes from different perspectives"</li> <li>" -I can lift/lower 3D objects</li> <li>- I can recolour a 3D object</li> <li>- I can resize an object in three dimensions"</li> <li>" -I can duplicate 3D objects</li> <li>- I can group 3D objects</li> <li>- I can rotate objects in three dimensions"</li> <li>" -I can accurately size 3D objects</li> <li>- I can combine a number of 3D objects</li> <li>- I can show that placeholders can create holes in 3D objects"</li> <li>" -I can analyse a 3D model</li> <li>- I can choose objects to use in a 3D model</li> <li>- I can combine objects in a design"</li> <li>" -I can construct a 3D model based on a design</li> <li>- I can explain how my 3D model could be improved</li> <li>- I can modify my 3D model to improve it"</li> </ul>

<b>Key Questions</b>	<ul style="list-style-type: none"> <li>• Why might an image need to be cropped?</li> <li>• How can the colour effects on an image affect how it is perceived?</li> <li>• What does cloning mean?</li> <li>• Why might photos be edited?</li> <li>• How can we ensure that images are suitable for a project?</li> <li>• How can text be added to an image?</li> </ul>	<ul style="list-style-type: none"> <li>• What is the difference between a vector drawing and a paper-based drawing?</li> <li>• How can an object be moved, resized and rotated?</li> <li>• Name 2 ways that consistency can be improved when creating a vector drawing?</li> <li>• What is a “layer” within a vector drawing?</li> <li>• What does grouping and ungrouping a series of objects do?</li> <li>• Why might a vector drawing be used?</li> </ul>	<ul style="list-style-type: none"> <li>• What does “perspective” mean?</li> <li>• Name 3 ways a 3D shape can be modified?</li> <li>• Why would 3D objects need to be combined?</li> <li>• Why is it important to accurately size a 3D object?</li> <li>• What objects might be used for a house in a 3D model?</li> <li>• How could your 3D model be improved next time?</li> </ul>
<b>Vocabulary</b>	<p>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.</p>	<p>vector, drawing tools, object, toolbar, vector drawing, move, resize, colour, rotate, duplicate/copy, zoom, select, align, modify, layers, order, copy, paste, group, ungroup, reuse, reflection</p>	<p>TinkerCAD, 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, cube, cuboid, sphere, cone, prism, pyramid, placeholder, hollow, choose, combine, construct, evaluate, modify</p>

## Year 5 - Programming B (Making quizzes)

	Prior Learning (Yr 4)	New Learning (Yr 5)	Future Learning (Yr 6)
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>" -I can list an everyday task as a set of instructions including repetition</li> <li>- I can modify a snippet of code to create a given outcome</li> <li>- I can predict the outcome of a snippet of code"</li> <li>" -I can choose when to use a count-controlled and an infinite loop</li> <li>- I can modify loops to produce a given outcome</li> <li>- I can recognise that some programming languages enable more than one process to be run at once"</li> <li>" -I can choose which action will be repeated for each object</li> <li>- I can evaluate the effectiveness of the repeated sequences used in my program</li> <li>- I can explain what the outcome of the repeated action should be"</li> <li>" -I can explain the effect of my changes</li> <li>- I can identify which parts of a loop can be changed</li> <li>- I can re-use existing code snippets on new sprites"</li> <li>" -I can develop my own design explaining what my project will do</li> <li>- I can evaluate the use of repetition in a project</li> <li>- I can select key parts of a given project to use in my own design"</li> <li>" -I can build a program that follows my design</li> <li>- I can evaluate the steps I followed when building my project</li> <li>- I can refine the algorithm in my design"</li> </ul>	<ul style="list-style-type: none"> <li>" -I can identify conditions in a program</li> <li>- I can modify a condition in a program</li> <li>- I can recall how conditions are used in selection"</li> <li>" -I can create a program with different outcomes using selection</li> <li>- I can identify the condition and outcomes in an 'if... then... else...!' statement</li> <li>- I can use selection in an infinite loop to check a condition"</li> <li>" -I can design the flow of a program which contains 'if... then... else...'</li> <li>- I can explain that program flow can branch according to a condition</li> <li>- I can show that a condition can direct program flow in one of two ways"</li> <li>" -I can identify the outcome of user input in an algorithm</li> <li>- I can outline a given task</li> <li>- I can use a design format to outline my project"</li> <li>" -I can implement my algorithm to create the first section of my program</li> <li>- I can share my program with others</li> <li>- I can test my program"</li> <li>" -I can extend my program further</li> <li>- I can identify the setup code I need in my program</li> <li>- I can identify ways the program could be improved"</li> </ul>	<ul style="list-style-type: none"> <li>" -I can apply my knowledge of programming to a new environment</li> <li>- I can test my program on an emulator</li> <li>- I can transfer my program to a controllable device"</li> <li>" -I can determine the flow of a program using selection</li> <li>- I can identify examples of conditions in the real world</li> <li>I can use a variable in an if, then, else statement to select the flow of a program"</li> <li>I can experiment with different physical inputs</li> <li>I can explain that checking a variable doesn't change its value</li> <li>- I can use a condition to change a variable"</li> <li>I can explain the importance of the order of conditions in else, if statements</li> <li>I can modify a program to achieve a different outcome</li> <li>I can use an operand (e.g. &lt;=&gt;) in an if, then statement"</li> <li>I can decide what variables to include in a project</li> <li>I can design the algorithm for my project</li> <li>I can design the program flow for my project"</li> <li>I can create a program based on my design</li> <li>I can test my program against my design</li> <li>I can use a range of approaches to find and fix bugs</li> </ul>

<b>Key Questions</b>	<ul style="list-style-type: none"> <li>• How can a cup of tea be made?</li> <li>• When might an infinite loop be used?</li> <li>• How can an action be repeated for an object?</li> <li>• What parts of a loop can be changed?</li> <li>• Can you identify repetition in the sequence?</li> <li>• What aspect of your project could be refined?</li> </ul>	<ul style="list-style-type: none"> <li>• How can a condition be modified?</li> <li>• Define how the following can change an outcome: if / then / else</li> <li>• Explain what a program flow is?</li> <li>• What effect does user input have on an outcome?</li> <li>• How can a program be tested?</li> <li>• What could be added to a program to extend it?</li> </ul>	<ul style="list-style-type: none"> <li>• What is an emulator?</li> <li>• Name 3 examples of conditions in the real world?</li> <li>• Identify 3 physical inputs?</li> <li>• What is an operand and how can it be used in an “if, then” statement?</li> <li>• What is a controllable device?</li> <li>• How would you improve your program next time?</li> </ul>
<b>Vocabulary</b>	Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify, design, algorithm, debug, refine, evaluate.	Selection, condition, true, false, count-controlled loop, outcomes, conditional statement, algorithm, program, debug, question, answer, task, design, input, implement, test, run, setup, operator	Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, sensing, accelerometer, value, compass, direction, navigation, design, task, algorithm, step counter, plan, create, code, test, debug.



## Year 6 - Computing systems and networks (Communication and collaboration)

	Prior Learning (Yr 5)	New Learning (Yr 6)	Future Learning
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>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</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>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</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>I can describe that a computer system features inputs, processes, and outputs</li> <li>I can explain that computer systems communicate with other devices</li> <li>I can explain that systems are built using a number of parts"</li> <li>" - I can explain the benefits of a given computer system</li> <li>- I can identify tasks that are managed by computer systems</li> <li>- I can identify the human elements of a computer system"</li> <li>" - I can compare results from different search engines</li> <li>- I can make use of a web search to find specific information</li> <li>- I can refine my web search"</li> <li>" - I can explain why we need tools to find things online</li> <li>I can recognise the role of web crawlers in creating an index</li> <li>- I can relate a search term to the search engine's index"</li> <li>I can explain that a search engine follows rules to rank results</li> <li>I can give examples of criteria used by search engines to rank results</li> <li>I can order a list by rank"</li> <li>I can describe some of the ways that search results can be influenced</li> <li>- I can explain how search engines make money</li> <li>- I can recognise some of the limitations of search engines</li> </ul>	<ul style="list-style-type: none"> <li>" - I can describe how computers use addresses to access websites</li> <li>- I can explain that internet devices have addresses</li> <li>- I can recognise that data is transferred using agreed methods "</li> <li>" - I can explain that all data transferred over the internet is in packets</li> <li>- I can explain that data is transferred over networks in packets</li> <li>- I can identify and explain the main parts of a data packet"</li> <li>" - I can explain that the internet allows different media to be shared</li> <li>- I can recognise how to access shared files stored online</li> <li>- I can send information over the internet in different ways"</li> <li>" - I can explain how the internet enables effective collaboration</li> <li>- I can identify different ways of working together online</li> <li>- I can recognise that working together on the internet can be public or private"</li> <li>" - I can choose methods of communication to suit particular purposes</li> <li>- I can explain the different ways in which people communicate</li> <li>- I can identify that there are a variety of ways to communicate over the internet"</li> <li>" - I can compare different methods of communicating on the internet</li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>

		<ul style="list-style-type: none"> <li>- I can decide when I should and should not share information online</li> <li>- I can explain that communication on the internet may not be private"</li> <li></li> </ul>	
<b>Key Questions</b>	<ul style="list-style-type: none"> <li>Name an input, process and output of a computer system?</li> <li>What tasks can be managed by a computer system?</li> <li>How can a web search be refined?</li> <li>What is an "index"</li> <li>Give 3 examples of criteria used by search engines?</li> <li>What is a limitation of a search engine?</li> </ul>	<ul style="list-style-type: none"> <li>What is a website address and what does it do?</li> <li>What is a packet?</li> <li>Name 3 ways information can be sent over the internet?</li> <li>What is the difference between working together publicly or privately?</li> <li>Name 3 ways to communicate and what you would use each one for?</li> <li>When is a safe time to share information over the internet?</li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>
<b>Vocabulary</b>	system, connection, digital, input, process, storage, output, search, search engine, refine, index, bot, ordering, links, algorithm, search engine optimisation (SEO), web crawler, content creator, selection, ranking.	communication, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, oneway, two-way, one-to-one, one-to-many.	KS3 curriculum

## Year 6 - Creating media (Web page creation)

	Prior Learning (Yr 5)	New Learning (Yr 6)	Future Learning
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>"- I can compare features in different videos</li> <li>- I can explain that video is a visual media format</li> <li>- I can identify features of videos"</li> <li>"- I can experiment with different camera angles</li> <li>- I can identify and find features on a digital video recording device</li> <li>- I can make use of a microphone"</li> <li>"- I can capture video using a range of filming techniques</li> <li>- I can review how effective my video is</li> <li>- I can suggest filming techniques for a given purpose"</li> <li>"- I can create and save video content</li> <li>- I can decide which filming techniques I will use</li> <li>- I can outline the scenes of my video"</li> <li>"- I can explain how to improve a video by reshooting and editing</li> <li>- I can select the correct tools to make edits to my video</li> <li>- I can store, retrieve, and export my recording to a computer"</li> <li>"- I can evaluate my video and share my opinions</li> <li>- I can make edits to my video and improve the final outcome</li> <li>- I can recognise that my choices when making a video will impact on the quality of the final outcome"</li> </ul>	<ul style="list-style-type: none"> <li>I can discuss the different types of media used on websites</li> <li>- I can explore a website</li> <li>- I know that websites are written in HTML"</li> <li>"- I can draw a web page layout that suits my purpose</li> <li>- I can recognise the common features of a web page</li> <li>- I can suggest media to include on my page"</li> <li>"- I can describe what is meant by the term 'fair use'</li> <li>- I can find copyright-free images</li> <li>- I can say why I should use copyright-free images"</li> <li>"- I can add content to my own web page</li> <li>- I can evaluate what my web page looks like on different devices and suggest/make edits</li> <li>- I can preview what my web page looks like"</li> <li>"- I can describe why navigation paths are useful</li> <li>- I can explain what a navigation path is</li> <li>- I can make multiple web pages and link them using hyperlinks"</li> <li>"- I can create hyperlinks to link to other people's work</li> <li>- I can evaluate the user experience of a website</li> <li>- I can explain the implication of linking to content owned by others"</li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li><b>What is a "visual media format"?</b></li> <li><b>Identify 3 features of a digital video recording device?</b></li> <li><b>Name 3 types of filming techniques?</b></li> <li><b>How can I create and save video content?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Name 3 types of media used on websites?</b></li> <li><b>What are the common features of a web page?</b></li> <li><b>What is meant by the term "fair use"?</b></li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>

	<ul style="list-style-type: none"> <li>• What is meant by the term “reshoot and edit”?</li> <li>• What would you change in your next video?</li> </ul>	<ul style="list-style-type: none"> <li>• What might change when looking at the same website on different devices?</li> <li>• What is a navigation path?</li> <li>• What is a hyperlink?</li> </ul>	
<b>Vocabulary</b> <b>y</b>	video, audio, camera, talking head, panning, close up, video camera, microphone, lens, mid-range, long shot, moving subject, side by side, angle (high, low, normal), static, zoom, pan, tilt, storyboard, filming, review, import, split, trim, clip, edit, reshoot, delete, reorder, export, evaluate, share.	website, web page, browser, media, Hypertext Markup Language (HTML), logo, layout, header, media, purpose, copyright, fair use, home page, preview, evaluate, device, Google Sites, breadcrumb trail, navigation, hyperlink, subpage, evaluate, implication, external link, embed.	KS3 curriculum

## Year 6 - Programming A (Variables in games)

	Prior Learning (Yr 5)	New Learning (Yr 6)	Future Learning
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>"- I can create a simple circuit and connect it to a microcontroller</li> <li>- I can explain what an infinite loop does</li> <li>- I can program a microcontroller to make an LED switch on"</li> <li>"- I can connect more than one output component to a microcontroller</li> <li>- I can design sequences that use count-controlled loops</li> <li>- I can use a count-controlled loop to control outputs"</li> <li>"- I can design a conditional loop</li> <li>- I can explain that a condition is either true or false</li> <li>- I can program a microcontroller to respond to an input"</li> <li>"- I can explain that a condition being met can start an action</li> <li>- I can identify a condition and an action in my project</li> <li>- I can use selection (an 'if...then...' statement) to direct the flow of a program"</li> <li>"- I can create a detailed drawing of my project</li> <li>- I can describe what my project will do</li> <li>- I can identify a real-world example of a condition starting an action"</li> <li>"- I can test and debug my project</li> <li>- I can use selection to produce an intended outcome</li> </ul>	<ul style="list-style-type: none"> <li>"- I can explain that the way a variable changes can be defined</li> <li>- I can identify examples of information that is variable</li> <li>- I can identify that variables can hold numbers or letters"</li> <li>"- I can explain that a variable has a name and a value</li> <li>- I can identify a program variable as a placeholder in memory for a single value</li> <li>- I can recognise that the value of a variable can be changed"</li> <li>"- I can decide where in a program to change a variable</li> <li>- I can make use of an event in a program to set a variable</li> <li>- I can recognise that the value of a variable can be used by a program"</li> <li>"- I can choose the artwork for my project</li> <li>- I can create algorithms for my project</li> <li>- I can explain my design choices"</li> <li>"- I can choose a name that identifies the role of a variable</li> <li>- I can create the artwork for my project</li> <li>- I can test the code that I have written"</li> <li>"- I can identify ways that my game could be improved</li> <li>- I can share my game with others</li> <li>- I can use variables to extend my game"</li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>

	<ul style="list-style-type: none"> <li>- I can write an algorithm that describes what my model will do"</li> <li></li> </ul>		
<b>Key Questions</b>	<ul style="list-style-type: none"> <li>What is an infinite loop?</li> <li>What is a count-controlled loop?</li> <li>What is a conditional loop?</li> <li>Can you identify a condition and an action in your project?</li> <li>Can you identify a condition starting an action in the real world?</li> <li>How can you test for issues in a project?</li> </ul>	<ul style="list-style-type: none"> <li>What does the term "variable" mean?</li> <li>Why might the value of a variable change?</li> <li>How can a variable's value be used in a program?</li> <li>Why are design choices important for a project?</li> <li>Why is the name given to a variable important to identify its role?</li> <li>How could you improve your game next time?</li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>
<b>Vocabulary</b>	microcontroller, USB, components, connection, infinite loop, output component, motor, repetition, count-controlled loop, Crumble controller, switch, LED, Sparkle, crocodile clips, connect, battery box, program, condition, Input, output, selection, action, debug, circuit, power, cell, buzzer	variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share, assign, declare	KS3 curriculum

## Year 6 - Data and information (Spreadsheets)

	Prior Learning (Yr 5)	New Learning (Yr 6)	Future Learning
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>"- I can create a database using cards</li> <li>- I can explain how information can be recorded</li> <li>- I can order, sort, and group my data cards"</li> <li>"- I can choose which field to sort data by to answer a given question</li> <li>- I can explain what a field and a record is in a database</li> <li>- I can navigate a flat-file database to compare different views of information"</li> <li>"- I can combine grouping and sorting to answer specific questions</li> <li>- I can explain that data can be grouped using chosen values</li> <li>- I can group information using a database"</li> <li>"- I can choose multiple criteria to answer a given question</li> <li>- I can choose which field and value are required to answer a given question</li> <li>- I can outline how 'AND' and 'OR' can be used to refine data selection"</li> <li>"- I can explain the benefits of using a computer to create charts</li> <li>- I can refine a chart by selecting a particular filter</li> <li>- I can select an appropriate chart to visually compare data"</li> <li>"- I can ask questions that will need more than one field to answer</li> <li>- I can present my findings to a group</li> <li>- I can refine a search in a real-world context "</li> </ul>	<ul style="list-style-type: none"> <li>"- I can collect data</li> <li>- I can enter data into a spreadsheet</li> <li>- I can suggest how to structure my data"</li> <li>"- I can apply an appropriate format to a cell</li> <li>- I can choose an appropriate format for a cell</li> <li>- I can explain what an item of data is"</li> <li>"- I can construct a formula in a spreadsheet</li> <li>- I can explain which data types can be used in calculations</li> <li>- I can identify that changing inputs changes outputs"</li> <li>"- I can apply a formula to multiple cells by duplicating it</li> <li>- I can calculate data using different operations</li> <li>- I can create a formula which includes a range of cells"</li> <li>"- I can apply a formula to calculate the data I need to answer questions</li> <li>- I can explain why data should be organised</li> <li>- I can use a spreadsheet to answer questions"</li> <li>"- I can produce a chart</li> <li>- I can suggest when to use a table or chart</li> <li>- I can use a chart to show the answer to questions"</li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li><b>Name 3 methods of recording data?</b></li> <li><b>Define a "field" and a "record" is in a database?</b></li> <li><b>What is the difference between grouping and sorting?</b></li> <li><b>How can "AND" and "OR" be used to refine data selection?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>How can data be collected?</b></li> <li><b>What does "format" mean?</b></li> <li><b>What is a "formula" and how can it be used in a spreadsheet?</b></li> <li><b>How could I calculate the total of 5 cells?</b></li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>

	<ul style="list-style-type: none"> <li>• <b>What are the benefits of using a computer to create charts?</b></li> <li>• <b>Can you refine a search in a real-world context?</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Why should data be organised?</b></li> <li>• <b>How can I create a chart to show my data?</b></li> </ul>	
<b>Vocabulary</b> <b>y</b>	database, data, information, record, field, sort, order, group, search, value, criteria, graph, chart, axis, compare, filter, presentation	data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, spreadsheet, input, output, operation, range, duplicate, sigma, propose, question, data set, organised, chart, evaluate, results, sum, comparison, software, tool	KS3 curriculum



## Year 6 - Creating media (3D Modelling)

	Prior Learning (Yr 5)	New Learning (Yr 6)	Future Learning
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>I can discuss how vector drawings are different from paper-based drawings</li> <li>I can experiment with the shape and line tools</li> <li>I can recognise that vector drawings are made using shapes"</li> <li>I can explain that each element added to a vector drawing is an object</li> <li>I can identify the shapes used to make a vector drawing</li> <li>I can move, resize, and rotate objects I have duplicated"</li> <li>I can explain how alignment grids and resize handles can be used to improve consistency</li> <li>I can modify objects to create a new image</li> <li>I can use the zoom tool to help me add detail to my drawings"</li> <li>I can change the order of layers in a vector drawing</li> <li>I can identify that each added object creates a new layer in the drawing</li> <li>I can use layering to create an image"</li> <li>I can copy part of a drawing by duplicating several objects</li> <li>I can recognise when I need to group and ungroup objects</li> <li>I can reuse a group of objects to further develop my vector drawing"</li> <li>I can compare vector drawings to freehand paint drawings</li> <li>I can create a vector drawing for a specific purpose</li> <li>I can reflect on the skills I have used and why I have used them"</li> </ul>	<ul style="list-style-type: none"> <li>"-I can add 3D shapes to a project</li> <li>- I can move 3D shapes relative to one another</li> <li>- I can view 3D shapes from different perspectives"</li> <li>"- I can lift/lower 3D objects</li> <li>- I can recolour a 3D object</li> <li>- I can resize an object in three dimensions"</li> <li>"- I can duplicate 3D objects</li> <li>- I can group 3D objects</li> <li>- I can rotate objects in three dimensions"</li> <li>"- I can accurately size 3D objects</li> <li>- I can combine a number of 3D objects</li> <li>- I can show that placeholders can create holes in 3D objects"</li> <li>"-I can analyse a 3D model</li> <li>- I can choose objects to use in a 3D model</li> <li>- I can combine objects in a design"</li> <li>"- I can construct a 3D model based on a design</li> <li>- I can explain how my 3D model could be improved</li> <li>- I can modify my 3D model to improve it"</li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>
<b>Key Questions</b>	<ul style="list-style-type: none"> <li><b>What is the difference between a vector drawing and a paper-based drawing?</b></li> <li><b>How can an object be moved, resized and rotated?</b></li> </ul>	<ul style="list-style-type: none"> <li><b>What does "perspective" mean?</b></li> <li><b>Name 3 ways a 3D shape can be modified?</b></li> <li><b>Why would 3D objects need to be combined?</b></li> <li><b>Why is it important to accurately size a 3D object?</b></li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>

	<ul style="list-style-type: none"> <li>● Name 2 ways that consistency can be improved when creating a vector drawing?</li> <li>● What is a “layer” within a vector drawing?</li> <li>● What does grouping and ungrouping a series of objects do?</li> <li>● Why might a vector drawing be used?</li> </ul>	<ul style="list-style-type: none"> <li>● What objects might be used for a house in a 3D model?</li> <li>● How could your 3D model be improved next time?</li> </ul>	
<b>Vocabulary</b>	vector, drawing tools, object, toolbar, vector drawing, move, resize, colour, rotate, duplicate/copy, zoom, select, align, modify, layers, order, copy, paste, group, ungroup, reuse, reflection	TinkerCAD, 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, cube, cuboid, sphere, cone, prism, pyramid, placeholder, hollow, choose, combine, construct, evaluate, modify	KS3 curriculum

## Year 6 - Programming B (Sensing movement)

	Prior Learning (Yr 5)	New Learning (Yr 6)	Future Learning
<b>National Curriculum Objectives</b>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>
<b>Key Ideas</b>	<ul style="list-style-type: none"> <li>" - I can identify conditions in a program</li> <li>- I can modify a condition in a program</li> <li>- I can recall how conditions are used in selection"</li> <li>" - I can create a program with different outcomes using selection</li> <li>- I can identify the condition and outcomes in an 'if... then... else...' statement</li> <li>- I can use selection in an infinite loop to check a condition"</li> <li>" - I can design the flow of a program which contains 'if... then... else...'</li> <li>- I can explain that program flow can branch according to a condition</li> <li>- I can show that a condition can direct program flow in one of two ways"</li> <li>" - I can identify the outcome of user input in an algorithm</li> <li>- I can outline a given task</li> <li>- I can use a design format to outline my project"</li> <li>" - I can implement my algorithm to create the first section of my program</li> <li>- I can share my program with others</li> <li>- I can test my program"</li> <li>" - I can extend my program further</li> <li>- I can identify the setup code I need in my program</li> <li>- I can identify ways the program could be improved"</li> <li></li> </ul>	<ul style="list-style-type: none"> <li>" - I can apply my knowledge of programming to a new environment</li> <li>- I can test my program on an emulator</li> <li>- I can transfer my program to a controllable device"</li> <li>" - I can determine the flow of a program using selection</li> <li>- I can identify examples of conditions in the real world</li> <li>I can use a variable in an if, then, else statement to select the flow of a program"</li> <li>I can experiment with different physical inputs</li> <li>I can explain that checking a variable doesn't change its value</li> <li>- I can use a condition to change a variable"</li> <li>I can explain the importance of the order of conditions in else, if statements</li> <li>I can modify a program to achieve a different outcome</li> <li>I can use an operand (e.g. &lt;=&gt;) in an if, then statement"</li> <li>I can decide what variables to include in a project</li> <li>I can design the algorithm for my project</li> <li>I can design the program flow for my project"</li> <li>I can create a program based on my design</li> <li>I can test my program against my design</li> <li>I can use a range of approaches to find and fix bugs</li> </ul>	<ul style="list-style-type: none"> <li>KS3 curriculum</li> </ul>

<b>Key Questions</b>	<ul style="list-style-type: none"> <li>• How can a condition be modified?</li> <li>• Define how the following can change an outcome: if / then / else</li> <li>• Explain what a program flow is?</li> <li>• What effect does user input have on an outcome?</li> <li>• How can a program be tested?</li> <li>• What could be added to a program to extend it?</li> </ul>	<ul style="list-style-type: none"> <li>• What is an emulator?</li> <li>• Name 3 examples of conditions in the real world?</li> <li>• Identify 3 physical inputs?</li> <li>• What is an operand and how can it be used in an “if, then” statement?</li> <li>• What is a controllable device?</li> <li>• How would you improve your program next time?</li> </ul>	<ul style="list-style-type: none"> <li>• KS3 curriculum</li> </ul>
<b>Vocabulary</b>	Selection, condition, true, false, count-controlled loop, outcomes, conditional statement, algorithm, program, debug, question, answer, task, design, input, implement, test, run, setup, operator	Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, sensing, accelerometer, value, compass, direction, navigation, design, task, algorithm, step counter, plan, create, code, test, debug.	KS3 curriculum