



The Computing Curriculum Year 3

Year 3 – Autumn 1		Unit 1 – Connecting Computers	
National Curriculum Objectives:			
<ul style="list-style-type: none">• Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.• Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration			
Cross Curricular Links			
Maths <ul style="list-style-type: none">• Number and place value: Solve number problems and practical problems			
Art <ul style="list-style-type: none">• To improve their mastery of art and design techniques, including drawing, painting and sculpture with a range of materials			
Unit Overview			
During this unit, learners develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. They also compare digital and non-digital devices. Following this, learners are introduced to computer networks, including devices that make up a network’s infrastructure, such as wireless access points and switches. The unit concludes with learners discovering the benefits of connecting devices in a network.			
Previous Knowledge acquired – Technology			
Year 1		Year 2	
<ul style="list-style-type: none">• Know technology as something that helps us• Know examples of technology in the classroom• Know how these technology examples help us• Know the names of the main parts of a computer• Know how to switch on and log into a computer• Know how to use a mouse to click and drag• Know how to use a mouse to open a program• Know how to click and drag to make objects on a screen• Know how to use a mouse to create a picture• Know what a keyboard is for• Know how to type my name on a computer• Know how to save my work to a file• Know how to open my work from a file• Know how to use the arrow keys to move the cursor• Know how to delete letters• Know rules to keep us safe and healthy when we are using technology in and beyond the home and give examples of some of these rules• Know how we benefit from these rules		<ul style="list-style-type: none">• Know examples of computers• Know and describe some uses of computers• Know that a computer is a part of information technology• Know and explain the purpose of information technology in the home• Know how to open a file• Know how to move and resize images• Know how to find examples of information technology• Know and talk about uses of information technology• Compare types of information technology• Know how information technology is used in a shop• Know that information technology can be connected• Know and explain how information technology helps people• Know different uses of information technology• Know how to use information technology responsibly• Know how those rules/guides can help me• Identify the choices that I make when using information technology• Know and explain simple guidance for using information technology in different environments and settings	
Progression of knowledge throughout the Computing curriculum - Technology			
Year 4	Year 5	Year 6	

<ul style="list-style-type: none"> • Know the internet is a network of networks • Know how information is shared across the internet • Know why a network needs protecting • Know the different networked devices and how they connect • Know how the internet allows us to view the World Wide Web • Know that the World Wide Web is the part of the internet that contains websites and web pages • Know the types of media that can be shared on the World Wide Web (WWW) • Know where websites are stored when uploaded to the WWW • Know how to access websites on the WWW • Know how to create media which can be found on websites • Know that I can add content to the WWW • Know that new content can be created online • Know that websites and their content are created by people • Know who owns the content on websites • Know that there are rules to protect content • Know that not everything on the World Wide Web is true. • Know why some information I find online may not be honest, accurate, or legal. • Know why I need to think carefully before I share or reshare content 	<ul style="list-style-type: none"> • Know that systems are built using a number of parts • Know that a computer system features inputs, processes, and outputs • Know that computer systems communicate with other devices • Know tasks that are managed by computer systems • Know the human elements of a computer system • Know the benefits of a given computer system • Know that data is transferred using agreed methods • Know that networked digital devices have unique addresses • Know that data is transferred over networks in packets • Know that connected digital devices can allow us to access shared files stored online • Know how to send information over the internet in different ways • Know that the internet allows different media to be shared • Know and suggest strategies to ensure successful group work • Compare working online with working offline • Know different ways of working together online • Know that working together on the internet can be public or private • Know how the internet enables effective collaboration 	<ul style="list-style-type: none"> • Know how to complete a web search to find specific information • Know how to refine my search • Know how to compare results from different search engines • Know why we need tools to find things online • Know the role of web crawlers in creating an index • Know how to relate a search term to the search engine's index • Know that search results are ordered • Know that a search engine follows rules to rank relevant pages • Know some of the criteria that a search engine checks to decide on the order of results • Know some of the ways that search results can be influenced • Know some of the limitations of search engines • Know how search engines make money • Know the different ways in which people communicate • Know that there are a variety of ways of communicating over the internet • Know to choose methods of communication to suit particular purposes • Know how to compare different methods of communicating on the internet • Know when I should and should not share • Know that communication on the internet may not be private
Key knowledge acquired throughout this unit		
<ul style="list-style-type: none"> • Know that digital devices accept inputs. • Know that digital devices produce outputs. • Know how to follow a process. • Know how to classify input and output devices. • Know how to model a simple process. • Know how to design a digital device. • Know how I use digital devices for different activities. 		

- Know how to recognise similarities between using digital devices and non-digital tools.
- Know the differences between using digital devices and non-digital tools.
- Know how to recognise different connections.
- Know how messages are passed through multiple connections.
- Know why we need a network switch.
- Know that a computer network is made up of a number of devices.
- Know and can demonstrate how information can be passed between devices.
- Know and can explain the role of a switch, server, and wireless access point in a network.
- Know and can identify how devices in a network are connected with one another.
- Know and can identify networked devices around me.
- Know and can identify the benefits of computer networks.

Teacher subject knowledge and guidance

Lesson 1: You will need an understanding of digital and non-digital devices. The key difference is that a digital device is capable of some processing, i.e. it has functions beyond being either on or off. You will also need to be familiar with the concept of input, process, output (IPO) which underpins all digital devices. There are cross-curricular links with maths for IPO which can be referenced during this lesson.

Lesson 2: You will need to be familiar with the inputs and outputs of a range of digital devices and you will need an understanding that devices can have one input which leads to several outputs (e.g. starting a video leads to outputs from the screen and the speaker) and that many inputs can lead to one output (e.g. using a mouse and keyboard to produce a document).

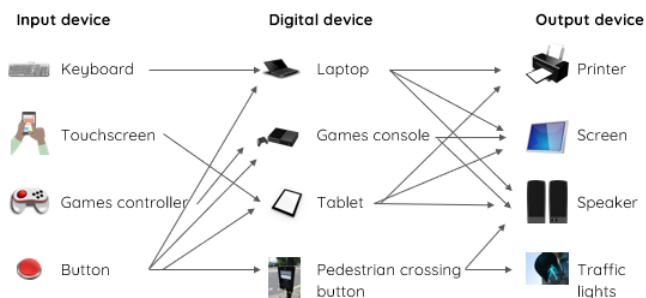
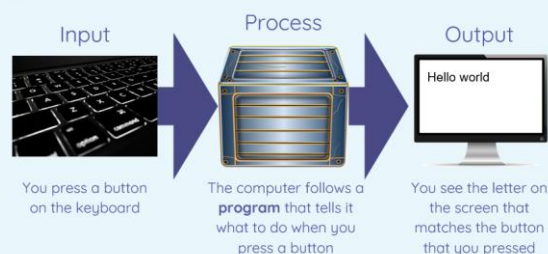
Lesson 3: You will need to be familiar with your chosen digital paint program, including the draw, fill, edit and undo functions.

Lesson 4: You will need a basic understanding of how information (data) flows around a computer network, and how this benefits us. You will also need to know that a network switch manages the way in which data moves around a network.

Lesson 5: This lesson requires further knowledge of a simple school network. It introduces a server, which for the purposes of this lesson is defined as a location to store files (they can, and usually do, carry out more functions than this). It also introduces wireless access points, which send and receive wireless signals from wireless devices such as tablets or laptops. There is likely to be a wireless access point in most classrooms or communal areas in school. It will be connected to the network via a physical cable.

Lesson 6: You will need to be familiar with how the main devices (network switch, server, wireless access point, router, printer/copier) on your school's network are connected with one another and where the devices are located. You may wish to discuss this with the IT technician prior to the lesson.




Digital devices must have an input, a process, and an output



User devices

Any device that connects to the network, either through wires or wirelessly.



Switch A device that enables multiple devices on a network to be connected together. 	Server A computer that manages the network and stores files. 	Wireless access point A device connected to a wired network, which sends and receives wireless signals for devices with WiFi connectivity. 	
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Subject specific vocabulary and definitions (Tier 3 vocabulary)


Inputs	Data that is sent to a program to be processed.
Processes	A program, or part of a program, that is running on a computer.
Outputs	The result of data processed by a computer.
Network	A group of interconnected computing devices.
Digital Device	A computer or a device with a computer inside (that has been programmed for a specific task.)
Wireless	A computer network using wireless signals.

Medium Term Planning

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
To explain how digital devices function	To identify input and output devices	To recognise how digital devices can change the way we work	To explain how a computer network can be used to share information	To explore how digital devices can be connected	To recognise the physical components of a network

Year 3 – Autumn 2		Unit 2 – Stop Frame Animation	
National Curriculum Objectives:			
<ul style="list-style-type: none">• Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.			
Cross Curricular Links			
English <ul style="list-style-type: none">• Pupils should be taught to: draft and write by: in narratives, creating settings, characters and plot• Pupils should be taught to: proof-read for spelling and punctuation errors			
History <ul style="list-style-type: none">• The Roman Empire and its impact on Britain			
Unit Overview			
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. It is recommended that you use a tablet for this unit as this makes it simpler for learners to take the photos and do the editing. However, you could use stop-frame animation software on a desktop or laptop if this is what you have available. This unit uses screenshots from iMotion which is an iPad app, but you could also try Stop Motion Studio if you have Android tablets.			
Previous Knowledge acquired – Digital Literacy			
Year 1		Year 2	
<ul style="list-style-type: none">• Know how to make marks on a screen and explain which tools were used• Know how to draw lines on a screen and explain which tools were used.• Know how to use paint tools to draw a picture.• Know how to make marks with the square and line tools• Know how to use shape and line tools effectively to recreate the work of an artist• Choose appropriate shapes• Know how to make appropriate colour choices• Know how to create a picture in the style of an artist• Know how to choose appropriate paint tools and colours to create the work of an artist• Know which tools were helpful and why• Know how to make dots of colour on the page• Know how to change the colour and brush size• Know how to use dots of colour to create a picture in the style of an artist on my own.		<ul style="list-style-type: none">• Know what devices can be used to take photographs• Know how to take a photograph• Know and explain what I did to capture a digital photo• Know the process of taking a good photograph• Know how to take photos in both landscape and portrait format• Know and explain why a photo looks better in portrait or landscape format• Know what is wrong with a photograph• Know how to take a good photograph• Know that I can improve a photograph by retaking it• Know the effect that light has on a photo• Know to experiment with different light sources• Know and explain why a picture may be unclear• Know that images can be changed• Know how to use a tool to achieve a desired effect• Know how to apply a range of photography skills to capture a photo• Know which photos have been changed• Know which photos are real and which have been changed	

Progression of knowledge throughout the Computing curriculum – Digital Literacy		
Year 4	Year 5	Year 6
<ul style="list-style-type: none"> • Know digital devices that can record sound and play it back • Know the inputs and outputs required to play audio or record sound • Know the range of sounds that can be recorded • Know how to use a device to record audio and play back sound • Know how to improve my recording • Know what other people include when recording sound for a podcast • Know how to plan and write the content for a podcast • Know why it is useful to be able to save digital recordings • Know how to save a digital recording as a file • Know how to open a digital recording from a file • Know ways in which audio recordings can be altered • Know how to edit sections of an audio recording • Know sounds that other people combine • Know suitable sounds to include in a podcast • Know how to use editing tools to arrange sections of audio • Know that digital recordings need to be exported to share them • Know the features of a digital recording I like • Know and suggest improvements to a digital recording 	<ul style="list-style-type: none"> • Know that video is a visual media format • Know features of videos • Know how to compare features in different videos • Know and find features on a digital video recording device • Know how to experiment with different camera angles • Know how to make use of a microphone • Know and suggest filming techniques for a given purpose • Know how to capture video using a range of filming techniques • Know how to review how effective my video is • Know how to outline the scenes of my video • Know how to decide which filming techniques I will use • Know how to create and save video content • Know how to store, retrieve, and export my recording to a computer • Know how to improve a video by reshooting and editing • Know how to select the correct tools to make edits to my video • Know how to make edits to my video and improve the final outcome • Know that my choices when making a video will impact the quality of the final outcome • Know how to evaluate my video and share my opinions 	<ul style="list-style-type: none"> • Know how to explore a website • Know the different types of media used on websites • Know that websites are written in HTML • Know the common features of a web page • Know which media to include on my page • Know how to draw a web page layout that suits my purpose • Know why I should use copyright-free images • Know how to find copyright-free images • Know what is meant by the term 'fair use' • Know how to add content to my own web page • Know how to preview what my web page looks like • Know to evaluate what my web page looks like on different devices and suggest/make edits. • Know what a navigation path is • Know why navigation paths are useful • Know how to make multiple web pages and link them using hyperlinks • Know the implication of linking to content owned by others • Know how to create hyperlinks to link to other people's work • Know to evaluate the user experience of a website
Key knowledge acquired throughout this unit		
<ul style="list-style-type: none"> • Know how to draw a sequence of pictures • Know how to create flip book—style animation. • Know how an animation and flip book works. • Know what an animation will look like. • Know why little changes are needed for each frame. • Know how to create and effective stop frame animation. • Know how to break down a story into settings, characters and events. • Know how to describe an animation that is achievable on screen. • Know how to create a storyboard. • Know how to use onion skinning to help me make small changes between frames. • Know how to review a sequence of frames to check my work. • Know how evaluate the quality of my animation. 		

Teacher subject knowledge and guidance					
Teachers will need to understand that animations are a series of still images stitched together to create a motion video. Animations can be created using on-screen or off-screen (flipbooks) images. Teachers need to understand how to create a simple flipbook (see lesson 1 for support) and how to use software to create an on-screen animation (support is provided in the lessons).					
Teachers will need to have an understanding of using their chosen software. Within the software, teachers will need to be aware of how to take images, ‘onion skinning’ (showing a part transparent photo to demonstrate the previous frame to make small movements more consistent), deleting frames and saving.					
<h3>What is an animation?</h3> <p>Animations have been created throughout history — even before computers were invented!</p> <p>An animation is where a number of pictures are drawn or taken of an object or picture, and the pictures are shown quickly, which makes it look like the object or picture is moving.</p> <p>Have you seen any animations?</p> 		<h3>What are the advantages and disadvantages of making stop-frame animations compared to the flipbooks that you made in lesson 1?</h3> <div><h4>Advantages:</h4><ul style="list-style-type: none">You can save the work that you have done on the iPadYou can speed up/slow down your animationUsing a whiteboard and pen, you can rub out mistakesYou could send your work via email (for example) to show others</div> <div><h4>Disadvantages:</h4><ul style="list-style-type: none">You need devices in order to do this taskDrawings are quite simplistic (we will build on this next lesson)It is essential to have preparation time to set up the classroom</div>		<h3>Checklist</h3> <div><h4>Be consistent</h4><ul style="list-style-type: none">Use the same charactersUse the same backgroundKeep your iPad in the same placeKeep your background in the same place</div> <div><h4>Be careful</h4><ul style="list-style-type: none">Use onion skinningMove your characters a small amount each timeCheck the picture on the screen before you take your photoTake care not to move anyone's iPadTake care not to move anyone's background</div>	
Subject specific vocabulary and definitions (Tier 3 vocabulary)					
Music	A background sound that can be listened to.				
Text	A body of writing that has been typed or written.				
Onion Skimming	Layering of frames in animation.				
Storyboard	A sequence of drawings that tell a story.				
Frame	Individual pictures placed in a sequence.				
Medium Term Planning					
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
To explain that animation is a sequence of drawings or photographs	To relate animated movement with a sequence of images	To plan an animation	To identify the need to work consistently and carefully	To review and improve an animation	To evaluate the impact of adding other media to an animation

Year 3 – Spring 1		Unit 3 – Branching Databases	
National Curriculum Objectives:			
Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.			
Unit Overview			
During this unit, learners will develop their understanding of what a branching database is and how to create one. They will gain an understanding of what attributes are and how to use them to sort groups of objects by using yes/no questions. The learners will create physical and on-screen branching databases. Finally, they will evaluate the effectiveness of branching databases and will decide what types of data should be presented as a branching database.			
Previous Knowledge acquired – Data Handling			
Year 1		Year 2	
<ul style="list-style-type: none">Know how to describe objects using labelsKnow how to match objects to groupsKnow how to identify the label for a group of objectsKnow how to count objectsKnow how to group objectsKnow how to count a group of objectsKnow how to describe an objectKnow how to describe a property of an objectKnow how to find objects with similar propertiesKnow how to group similar objectsKnow how to group objects in more than one wayKnow how to count how many objects share a propertyKnow how to choose how to group objectsKnow how to describe groups of objectsKnow how to record how many objects are in a groupKnow how to decide how to group objects to answer a questionKnow how to compare groups of objectsKnow how to record and share what I have found		<ul style="list-style-type: none">Know how to record data in a tally chartKnow how to represent a tally count as a totalKnow how to compare totals in a tally chartKnow how to enter data onto a computerKnow how to use a computer to view data in a different formatKnow how to use pictograms to answer simple questions about objectsKnow how to organise data in a tally chartKnow how to use a tally chart to create a pictogramKnow what the pictogram showsKnow how to tally objects using a common attributeKnow how to create a pictogram to arrange objects by an attributeKnow how to answer, ‘more than’/’less than’ and ‘most/least’ questions about an attributeKnow how to choose a suitable attribute to compare peopleKnow how to collect the data I needKnow how to create a pictogram and draw conclusions from itKnow how to use a computer program to present information in different waysKnow to share what I have found out using a computerKnow to give simple examples of why information should not be shared	
Progression of knowledge throughout the Computing curriculum – Data Handling			
Year 4	Year 5		Year 6
<ul style="list-style-type: none">Know how to choose a data set to answer a given questionKnow how to suggest questions that can be answered using a given data set	<ul style="list-style-type: none">Know how to create multiple questions about the same fieldKnow how information can be recorded		<ul style="list-style-type: none">Know and explain the relevance of data headingsKnow how to answer questions from an existing data set

<ul style="list-style-type: none"> • Know that data gathered over time can be used to answer questions • Know data that can be gathered over time • Know that sensors are input devices • Know how to use data from a sensor to answer a given question • Know that data from sensors can be recorded • Know a suitable place to collect data • Know the intervals used to collect data • Know about the data that I have captured • Know how to import a data set • Know how to use a computer to view data in different ways • Know how to use a computer program to sort data • Know to propose a question that can be answered using logged data • Know how to collect data using a data logger • Know how to interpret data that has been collected using a data logger • Know how to draw conclusions from the data that I have collected <ul style="list-style-type: none"> • Know the benefits of using a data logger 	<ul style="list-style-type: none"> • Know how to order, sort, and group my data cards • Know how to navigate a flat-file database to compare different views of information • Know what a 'field' and a 'record' is in a database • Know which field to sort data by to answer a given question • Know how information can be grouped • Know how to group information to answer questions • Know how to combine grouping and sorting to answer more specific questions • Know which field and value are required to answer a given question • Know how 'AND' and 'OR' can be used to refine data selection • Know to choose multiple criteria to answer a given question • Know to an appropriate chart to visually compare data • Know to refine a chart by selecting a particular filter • Know the benefits of using a computer to create graphs • Know to ask questions that will need more than one field to answer • Know how to refine a search in a real-world context • 	<ul style="list-style-type: none"> • Know to ask simple relevant questions which can be answered using data • Know what an item of data is • Know how to apply an appropriate number format to a cell • Know how to build a data set in a spreadsheet application • Know and explain the relevance of a cell's data type • Know how to construct a formula in a spreadsheet • Know that changing inputs changes outputs • Know that data can be calculated using different operations • Know how to create a formula which includes a range of cells • Know how to apply a formula to multiple cells by duplicating it • Know how to use a spreadsheet to answer questions • Know and explain why data should be organised • Know and apply a formula to calculate the data I need to answer questions • Know how to produce a graph • Know how to use a graph to show the answer to questions • Know when to use a table or graph
Key knowledge acquired throughout this unit		

- Know how to investigate questions with yes/no answers.
- Know how to make up a yes/no question about a collection of objects.
- Know how to create two groups of objects separated by one attribute.
- Know select an attribute to separate objects into groups.
- Know how to create a group of objects within an existing group.
- Know how to arrange objects into a tree structure.
- Know how to select objects to arrange in a branching database.
- Know how to group objects using my own yes/no questions.
- Know how my branching database works.
- Know how to create yes/no questions using given attributes.
- Know how to explain that questions need to be ordered carefully to split objects into similarly sized groups.
- Know how to compare two branching database structures.
- Know how to select a theme and choose a variety of objects.
- Know how to create questions and apply them to a tree structure.
- Know how to use my branching database to answer questions.
- Know how to explain what a pictogram tells me.
- Know how to explain what a branching database tells me.
- Know how to compare two ways of presenting information

Subject knowledge and teacher guidance

This unit focuses on branching databases. A branching database is a collection of data organised in a tree structure using yes/no or true/false questions. In computer science, these are known as binary trees. In the final lesson of this unit, learners will begin to recognise that information can be presented in different ways. Teachers will need to be familiar with pictograms. A pictogram is a pictorial representation of information, usually used to present numerical data, such as common methods of transport amongst a group of people.

Teachers will also need to be familiar with the term attributes. An attribute includes its name and a value. For example, a ball will have a colour which might be red. Colour is the attribute name, red is the attribute value. Learners may be familiar with the term property introduced in Year 1 – ‘Grouping data’. Property and attribute are interchangeable; however, property has been used with younger children to make it more accessible.

Throughout this unit, learners will use the online database tool j2data. You should be familiar with using the ‘Branch’ tool. Support with navigating the ‘Branch’ tool can be found at <https://www.j2e.com/help/videos/datags3>. Teachers would also benefit from having an understanding of the ‘Pictogram’ tool. Support with navigating the ‘Pictogram’ tool can be found at <https://www.j2e.com/help/videos/ks1datavideo1>.

Subject specific vocabulary and definitions (Tier 3 vocabulary)

Branching database	A database which has different ways of classifying certain groups
Attribute	A characteristic given to a person, group or thing
Questions	Something asked to find information
Evaluate	Sup up ideas
Pictogram	Pictorial representation of data

Medium Term Planning

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
To create questions with yes/no answers	To identify the object attributes needed to collect relevant data	To create a branching database	To explain why it is helpful for a database to be well structured	To identify objects using a branching database	To compare the information shown in a pictogram with a branching database

Year 3 – Spring 2		Unit 4 – Desktop Publishing	
National Curriculum Objectives			
Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.			
Unit Overview			
Learners will become familiar with the terms ‘text’ and ‘images’ and understand that they can be used to communicate messages. They will use desktop publishing software and consider careful choices of font size, colour and type to edit and improve premade documents. Learners will be introduced to the terms ‘templates’, ‘orientation’, and ‘placeholders’ and begin to understand how these can support them in making their own template for a magazine front cover. They will start to add text and images to create their own pieces of work using desktop publishing software. Learners will look at a range of page layouts thinking carefully about the purpose of these and evaluate how and why desktop publishing is used in the real world. The suggested application for this unit is Adobe Spark. To use Spark accounts are needed for learners. A guide to creating accounts is provided in lesson 2. Adobe Spark is web based and can be used on tablets, desktops and laptops.			
Previous Knowledge acquired – Digital Literacy			
Year 1		Year 2	
<ul style="list-style-type: none">• Know how to open a word processor• Know keys on a keyboard• Know how to enter text into a computer• Know how to use letter, number, and space keys• Know how to use backspace to remove text• Know how to type capital letters• Know where the toolbar is and use bold, italic, and underline• Know how to select a word by double-clicking• Know how to select all of the text by clicking and dragging• Know how to change the font• Know and say what tool I used to change the text• Know if my changes have improved my writing• Know how to use ‘undo’ to remove changes• Know how to write a message on a computer and on paper• Compare using a computer with using a pencil and paper• Know which method I like best		<ul style="list-style-type: none">• Know and identify simple differences in pieces of music• Know to listen with concentration to a range of music (links to the Music curriculum)• Know how music makes me feel, e.g. happy or sad• Know how to create a rhythm pattern• Know how to play an instrument following a rhythm pattern• Know how to explain that music is created and played by humans• Know how to connect images with sounds• Know how to use a computer to experiment with pitch and duration• Know to relate an idea to a piece of music• Know that music is a sequence of notes• Know how to use a computer to create a musical pattern using three notes• Know how to describe an animal using sounds• Know to explain my choices• Know how to save my work• Know to refine my musical pattern on a computer• Know how to reopen my work• Know to explain how I made my work better• Know to listen to music and describe how it makes me feel	
Progression of knowledge throughout the Computing curriculum - Digital Literacy			
Year 4	Year 5		Year 6

<ul style="list-style-type: none"> • Know the changes that we can make to an image • Know how images can be changed in real life • Know the effect that editing can have on an image • Know what has changed in an edited image • Know how to change the composition of an image by selecting parts of it • Know why someone might want to change the composition of an image • Know and talk about changes made to images • Know how to use effects to make my image fit a scenario • Know why my choices fit a scenario • Know how an image has been retouched • Know examples of positive and negative effects that retouching can have on an image • Know appropriate tools to retouch an image • Know how to sort images into 'fake' or 'real' and explain my choices • Know how to combine parts of images to create new images • Know the effect of adding other elements to my work • Know to compare the original image with my completed publication • Know to evaluate the impact of my publication on others through feedback 	<ul style="list-style-type: none"> • Know that vector drawings are made using shapes • Know how to experiment with the shape and line tools • Know how vector drawings are different from paper-based drawings • Know the shapes used to make a vector drawing • Know that each element added to a vector drawing is an object • Know how to move, resize, and rotate objects I have duplicated • Know how to use the zoom tool to help me add detail to my drawings • Know how alignment grids and resize handles can be used to improve consistency • Know how to modify objects to create a new image • Know that each added object creates a new layer in the drawing • Know how to change the order of layers in a vector drawing • Know how to use layering to create an image • Know how to copy part of a drawing by duplicating several objects • Know how to recognise when I need to group and ungroup objects • Know how to reuse a group of objects to further develop my vector drawing • Know how to create a vector drawing for a specific purpose • Know to reflect on the skills I have used and why I have used them • Know how to compare vector drawings to freehand paint drawings 	<ul style="list-style-type: none"> • Know the similarities and differences between 2D and 3D shapes • Know why we might represent 3D objects on a computer • Know how to select, move, and delete a digital 3D shape • Know how graphical objects can be modified • Know how to resize a 3D object • Know how to change the colour of a 3D object • Know how to rotate a 3D object • Know how to position 3D objects in relation to each other • Know how to select and duplicate multiple 3D objects • Know how to identify the 3D shapes needed to create a model of a real-world object • Know how to create digital 3D objects of an appropriate size • Know how to group a digital 3D shape and a placeholder to create a hole in an object • Know to plan my 3D model • Know which 3D objects I need to construct my model • Know how to modify multiple 3D objects • Know how my model can be improved • Know to modify my model to improve it • Know to evaluate my model against a given criterion
Key knowledge acquired throughout this unit		
<ul style="list-style-type: none"> • Know the difference between text and images. • Know that text and images can communicate messages clearly. • Know I can identify the advantages and disadvantages of using text and images. • Know how to change font style, size, and colours for a given purpose. • Know how to edit text. • Know how to explain that text can be changed to communicate more clearly. • Know and can explain what 'page orientation' means. • Know how to recognise placeholders and say why they are important. 		

- Know how to create a template for a particular purpose.
- Know how to add content to a desktop publishing publication.
- Know how to choose the best locations for my content.
- Know how to paste text and images to create a magazine cover.
- Know how to make changes to content after I've added it.
- Know how different layouts can suit different purposes
- Know how to identify different layouts.
- Know how to match a layout to a purpose.
- Know how to choose a suitable layout for a given purpose.
- Know the benefits of desktop publishing
- Know how to identify the uses of desktop publishing in the real world.
- Know how to say why desktop publishing might be helpful.

Know how to compare work made on desktop publishing to work created by hand.

Teacher knowledge and subject guidance

What is desktop publishing?

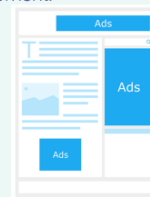
Desktop publishing is a way of creating documents that include both text and images, such as invitations, magazines, or newsletters using page layout software.








It was originally called desktop publishing because people used desktop computers like the one shown above to create their documents.

Placeholders

Placeholders are the boxes that hold the place of the text or images that you are going to add to your document.



Placeholders are helpful because you can design your page layout before having to think about the content you are going to add.

		 <p>Magazine</p>	<ul style="list-style-type: none"> • This is used to give detailed messages • The text is often colourful and bright • Lots of images are used • The orientation is often portrait • It takes a long time to make it and check that there aren't any mistakes
 <p>Newspaper</p>	<ul style="list-style-type: none"> • This is used to give detailed messages • The text is often black and white • Some images are added • The orientation is often portrait • It takes a long time to make it and check that there aren't any mistakes 	 <p>Letter</p>	<ul style="list-style-type: none"> • This often includes an address • There are few images • These are sometimes put inside envelopes
 <p>Poster</p>	<ul style="list-style-type: none"> • This is used to give a quick message • It is eye-catching and there is little text on it • Pictures are used to make it more interesting and appealing • It is quick to make 	 <p>Postcard</p>	<ul style="list-style-type: none"> • It is quick to read and write • This is used to give a quick message • There is writing on the front and a picture on the back • There is space for a stamp
Subject specific vocabulary and definitions (Tier 3 vocabulary)			

Text	Writing on a computer
Font	The size and style of the text
Orientation	Whether the page is landscape or portrait
Placeholder	Boxes that hold the place of the text or image you will add
Template	A model page

Medium Term Planning					
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
To recognise how text and images convey information	To recognise that text and layout can be edited	To choose appropriate page settings	To add content to a desktop publishing publication	To consider how different layouts can suit different purposes	To consider the benefits of desktop publishing

Year 3 – Summer 1	Unit 5 – Sequence in Music
National Curriculum Objectives:	
<ul style="list-style-type: none"> • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information 	
Unit Overview	
<p>This unit explores the concept of sequencing in programming through Scratch. It begins with an introduction to the programming environment, which will be new to most learners. They will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. The unit is paced to focus on all aspects of sequences, and make sure that knowledge is built in a structured manner. Learners also apply stages of program design through this unit.</p> <p>There are two Year 3 programming units:</p> <ul style="list-style-type: none"> • Programming A - Sequencing sounds • Programming B - Events and actions in programs <p>This is unit A which should be delivered before unit B.</p>	
Previous Knowledge acquired – Programming A	
Year 1	Year 2
<ul style="list-style-type: none"> • I can predict the outcome of a command on a device • Know how to match a command to an outcome • Know how to run a command on a device • Know how to follow an instruction • Know how to recall words that can be acted out • Know how to give directions • Know how to compare forwards and backwards movements • Know to start a sequence from the same place • I can predict the outcome of a sequence involving forwards and backwards commands • Know to compare left and right turns • Know how to experiment with turn and move commands to move a robot • I can predict the outcome of a sequence involving up to four commands • Know how to what my program should do • Know how to choose the order of commands in a sequence • Know how to debug my program • Know to identify several possible solutions • Know how to plan two programs • Know how to use two different programs to get to the same place 	<ul style="list-style-type: none"> • I can predict the outcome of a command on a device • Know how to match a command to an outcome • Know how to run a command on a device • Know how to follow an instruction • Know how to recall words that can be acted out • Know how to give directions • Know how to compare forwards and backwards movements • Know to start a sequence from the same place • I can predict the outcome of a sequence involving forwards and backwards commands • Know to compare left and right turns • Know how to experiment with turn and move commands to move a robot • I can predict the outcome of a sequence involving up to four commands • Know how to what my program should do • Know how to choose the order of commands in a sequence • Know how to debug my program • Know to identify several possible solutions • Know how to plan two programs • Know how to use two different programs to get to the same place

Progression of knowledge throughout the Computing curriculum – Programming A		
Year 4	Year 5	Year 6
<ul style="list-style-type: none"> • Know how to program a computer by typing commands • Know the effect of changing a value of a command • Know how to create a code snippet for a given purpose • Know how to use a template to draw what I want my program to do • Know how to write an algorithm to produce a given outcome • Know how to test my algorithm in a text-based language • Know examples of repetition in everyday tasks • Know how to identify patterns in a sequence • Know how to use a count-controlled loop to produce a given outcome • Know the effect of changing the number of times a task is repeated • Know to predict the outcome of a program containing a count-controlled loop • Know how to choose which values to change in a loop • Know where there are ‘chunks’ of actions in the real world • Know how to use a procedure in a program • Know that a computer can repeatedly call a procedure • Know how to design a program that includes count-controlled loops • Know how to make use of my design to write a program • Know how to develop my program by debugging it 	<ul style="list-style-type: none"> • Know how to build a simple circuit to connect a microcontroller to a computer • Know how to program a microcontroller to light an LED • Know and explain why I used an infinite loop • Know how to connect more than one output device to a microcontroller • Know how to design sequences for given output devices • Know which output devices I control with a count-controlled loop • Know that a condition is something that can be either true or false (eg whether a value is more than 10, or whether a button has been pressed) • Know to experiment with a ‘do until’ loop • Know how to program a microcontroller to respond to an input • Know that a condition being met can start an action • Know how to identify a condition and an action in my project • Know how to use selection (an ‘if... then...’ statement) to direct the flow of a program • Know how to identify a condition to start an action (real world) • Know and describe what my project will do (the task) • Know how to create a detailed drawing of my project • Know how to write an algorithm to control lights and a motor • Know to use selection to produce an intended outcome 	<ul style="list-style-type: none"> • Know examples of information that is variable • Know that the way that a variable changes can be defined • Know that variables can hold numbers or letters • Know to identify a program variable as a placeholder in memory for a single value • Know that a variable has a name and a value • Know that the value of a variable can be changed • Know where in a program to change a variable • Know to make use of an event in a program to set a variable • Know that the value of a variable can be used by a program • Know how to choose the artwork for my project • Know to explain my design choices • Know how to create algorithms for my project • Know how to create the artwork for my project • Know to choose a name that identifies the role of a variable • Know how to test the code that I have written • Know ways that my game could be improved • Know how to extend my game further using more variables • Know how to share my game with others

	<ul style="list-style-type: none"> • Know how to test and debug my project 	
Key knowledge acquired throughout this unit		
<ul style="list-style-type: none"> • Know all the objects in a Scratch project (sprites, backdrops) • Know that objects in Scratch have attributes (linked to) • Know that commands in Scratch are represented as blocks • Know that each sprite is controlled by the commands I choose • Know a word which describes an on-screen action for my design • Know how to create a program following a design • Know how to start a program in different ways • Know how to create a sequence of connected commands • Know how to explain that the objects in my project will respond exactly to the code • Know how to explain what a sequence is • Know how to combine sound commands • Know how to order notes into a sequence • Know how to build a sequence of commands • Know how to decide the actions for each sprite in a program • Know how to make design choices for my artwork • Know the names of the objects I will need for a project • Know how to relate a task description to a design • Know how to implement my algorithm as code 		
Teacher knowledge and subject guidance		
<p>This unit focuses on developing learners' understanding of sequences in a new programming language. It highlights that the order of sequences is important. This unit also develops learners' understanding of design in programming, using the approach outlined below.</p> <p>When programming, there are four levels which can help describe a project (known as levels of abstraction). Research suggests that this structure can support learners in understanding how to create a program and how it works:</p> <ul style="list-style-type: none"> • Task - what is needed • Design - what it should do • Code - how it is done • Running the code - what it does <p>Spending time at the task and design levels before engaging in code-writing can aid learners in assessing the 'do-ability' of their programs. It also reduces a learner's cognitive load during programming.</p> <p>Learners will move between the different levels throughout the unit and this is highlighted within each lesson plan.</p>		

This is Scratch

Programming blocks

Programming area

Stage with sprite

Match the blocks to the outcome

Sprite moves slowly to another part of the stage

Sprite points downwards

Sprite moves suddenly to another part of the stage

point in direction 180

glide 1 secs to random position

go to random position

Animate with costumes

You can use a very simple code sequence to animate the appearance of sprites:

when this sprite clicked

next costume

Try it here (click on each sprite): nccce.io/pg3a-5-a2-ca

Which sprite has the most costumes?

Subject specific vocabulary and definitions (Tier 3 vocabulary)					
Code	The commands that a computer can run				
Sequence	Events that happen one after each other				
Sprite	A character				
Program	A set of ordered commands that can be run by a computer to complete a task				
Motion blocks	Blocks that make the sprite move				
Event blocks	Blocks that tell Scratch to start running the program				
Medium Term Planning					
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
To explore a new programming environment	To identify that commands have an outcome	To explain that a program has a start	To recognise that a sequence of commands can have an order	To change the appearance of my project	To create a project from a task description

Year 3 – Summer 2	Unit 6 – Events and Actions
National Curriculum Objectives:	
<ul style="list-style-type: none">Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller partsUse sequence, selection, and repetition in programs; work with variables and various forms of input and outputUse logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programsSelect, 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	
Unit Overview	
<p>This unit explores the links between events and actions, while consolidating prior learning relating to sequencing. Learners begin by moving a sprite in four directions (up, down, left, and right). They then explore movement within the context of a maze, using design to choose an appropriately sized sprite. This unit also introduces programming extensions, through the use of Pen blocks. Learners are given the opportunity to draw lines with sprites and change the size and colour of lines. The unit concludes with learners designing and coding their own maze-tracing program.</p> <p>There are two Year 3 programming units:</p> <ul style="list-style-type: none">Programming A – Sequencing soundsProgramming B – Events and actions in programs <p>This is unit B, which should be delivered after unit A.</p>	
Previous Knowledge acquired – Programming B	
Year 1	Year 2
<ul style="list-style-type: none">I can find the commands to move a spriteI can use commands to move a spriteI can compare different programming toolsI can use more than one block by joining them togetherI can use a Start block in a programI can run my programI can find blocks that have numbersI can change the valueI can say what happens when I change a valueI can show that a project can include more than one spriteI can delete a spriteI can add blocks to each of my spritesI can choose appropriate artwork for my projectI can decide how each sprite will moveI can create an algorithm for each spriteI can use sprites that match my designI can add programming blocks based on my algorithmI can test the programs I have created	<ul style="list-style-type: none">Know where the start of a sequence isKnow that a program needs to be startedKnow how to run my programKnow to predict the outcome of a sequence of commandsKnow how to match two sequences with the same outcomeKnow how to change the outcome of a sequence of commandsKnow how to work out the actions of a sprite in an algorithmKnow which blocks to use to meet the designKnow how to build the sequences of blocks I needKnow how to choose backgrounds for the designKnow how to choose characters for the designKnow how to create a program based on the new designKnow how to choose the images for my own designKnow how to create an algorithmKnow how to build sequences of blocks to match my designKnow how to compare my project to my designKnow how to improve my project by adding featuresKnow how to debug

Progression of knowledge throughout the Computing curriculum – Programming B		
Year 4	Year 5	Year 6
<ul style="list-style-type: none"> • Know an everyday task as a set of instructions including repetition • Know to predict the outcome of a snippet of code • Know how to modify a snippet of code to create a given outcome • Know how to modify loops to produce a given outcome • Know when to use a count-controlled and an infinite loop • Know that some programming languages enable more than one process to be run at once • Know which action will be repeated for each object • Know what the outcome of the repeated action should be • Know to evaluate the effectiveness of the repeated sequences used in my program • Know which parts of a loop can be changed • Know the effect of my changes • Know to re-use existing code snippets on new sprites • Know to evaluate the use of repetition in a project • Know to select key parts of a given project to use in my own design • Know how to develop my own design explaining what my project will do • Know to refine the algorithm in my design • Know to build a program that follows my design • Know to evaluate the steps I followed when building my project 	<ul style="list-style-type: none"> • Know how conditions are used in selection • Know how to identify conditions in a program • Know how to modify a condition in a program • Know how to use selection in an infinite loop to check a condition • Know to identify the condition and outcomes in an 'if... then... else...' statement • Know how to create a program with different outcomes using selection • Know that program flow can branch according to a condition • Know how to design the flow of a program which contains 'if... then... else...' • Know that a condition can direct program flow in one of two ways • Know how to outline a given task • Know how to use a design format to outline my project • Know how to identify the outcome of user input in an algorithm • Know how to implement my algorithm to create the first section of my program • Know how to test my program • Know how to share my program with others • Know to identify ways the program could be improved • Know how to identify the setup code I need in my program • Know how to extend my program further 	<ul style="list-style-type: none"> • Know how to apply my knowledge of programming to a new environment • Know how to test my program on an emulator • Know how to transfer my program to a controllable device • Know how to identify examples of conditions in the real world • Know to use a variable in an if, then, else statement to select the flow of a program • Know how to determine the flow of a program using selection • Know to use a condition to change a variable • Know how to experiment with different physical inputs • Know that if you read a variable, the value remains • Know the importance of the order of conditions in else, if statements • Know how to use an operand (e.g. <=>) in an if, then statement • Know how to modify a program to achieve a different outcome • Know what variables to include in a project • Know how to design the algorithm for my project • Know how to design the program flow for my project • Know how to create a program based on my design • Know how to test my program against my design • Know to use a range of approaches to find and fix bugs
Key knowledge acquired throughout this unit		

- Know the relationship between an event and an action
- Know which keys to use for actions and explain my choices
- Know a way to improve a program
- Know a suitable size for a character in a maze
- Know how to program movement
- Know how to use a programming extension
- Know to consider the real world when making design choices
- Know which blocks to use to set up my program
- Know additional features (from a given set of blocks)
- Know suitable keys to turn on additional features
- Know how to build more sequences of commands to make my design work
- Know how to test a program against a given design
- Know how to match a piece of code to an outcome
- Know how to modify a program using a design
- Know to make design choices and justify them
- Know how to implement my design
- Know to evaluate my project

Teacher subject knowledge and guidance

This unit focuses on the links between ‘events’ and ‘actions’ in programming, while also developing learners’ understanding of sequencing. It highlights that events cause actions, and that the order of those actions can have an impact on the outcome of a program. This unit also further develops learners’ understanding of design in programming, using the approach outlined below.

When programming, there are four levels that help to describe the stages of a project, known as levels of abstraction. Research suggests that this structure can support learners in understanding how to create a program and how it works.

- Task — this is what is needed
- Design — this is what it should do
- Code — this is how it is done
- Running the code — this is what it does

Spending time at the Task and Design levels before engaging in code writing aids learners in assessing the ‘do-ability’ of their programs and reduces a learner’s cognitive load during programming.

Learners will move between the different levels throughout the unit. This is highlighted within each lesson plan.

1. Review the task — what should the project do?
2. Test the project
3. Identify the bug
4. Fix the bug
5. Test the bug fix — does the code now do what it should?

Subject specific vocabulary and definitions (Tier 3 vocabulary)

Sprite	A character
Algorithm	A precise set of ordered steps that can be followed by a human or a computer to achieve a task
Code	The commands that a computer can run
Duplicate	Make an exact copy
Value	Number or amount
Debugging	The process of finding and correcting errors in a program

Medium Term Planning

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
To explain how a sprite moves in an existing project	To create a program to move a sprite in four directions	To adapt a program to a new context	To develop my program by adding features	To identify and fix bugs in a program	To design and create a maze-based challenge