Progression in Computing
Iqra Primary School

Computer Science aspects covered	Unit of work	Year 1 NC Objectives	Progression of skills
Using ICT beyond school	<u>Computing systems and networks – Technology around us</u> Develop learners' understanding of technology and how it can help them. They will become more familiar with the different components of a computer by developing their keyboard and mouse skills, and also start to consider how to use technology responsibly.	-Recognise common uses of information technology beyond school. -Use technology purposefully to create, organise, store, manipulate, and retrieve digital content -Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. **E-safety** **Health, well-being and lifestyle** -I can identify rules that help keep us safe and healthy in and beyond the home when using technology -I can give some simple examples **Copyright and ownership** -I know that the work I create belongs to me -I can name my work so that others know it belongs to me	Learners will build their knowledge of parts of a computer and develop the basic skills needed to effectively use a computer keyboard and mouse. *This unit directly precedes the Y2 Computer systems and networks unit, IT around us.*
Programming, Problem solving	<u>Programming A: Moving a robot</u> This unit introduces learners 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 floor robot command does and use that knowledge to start predicting the outcome of programs. The unit is paced to ensure time is spent on all aspects of	-Understand what algorithms are. -Understand how algorithms are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. -Create and debug simple programs. -Use logical reasoning to predict the behaviour of simple programs.	This unit progresses students' knowledge and understanding of giving and following instructions. It moves from giving instructions to each other to giving instructions to a robot by programming it.

	programming and builds knowledge in a structured manner. Learners are also introduced to the early stages of program design through the introduction of algorithms.		
Creating content	<u>Creating media – digital writing</u> Explore the world of digital art and its exciting range of creative tools with your learners. Empower them to create their own paintings, while getting inspiration from a range of other artists. Conclude by asking them to consider their preferences when painting with, and without, the use of digital devices.	-Use technology purposefully to organise, store and retrieve digital content. **E-safety** **Privacy and security** -I can give reasons why I should only share information with people I choose to and can trust. (Retell and type a story using Purplemash)	The learners will develop their ability to find and use the keys on a keyboard in order to create digital content. The learners are then introduced to manipulating the resulting text, making cosmetic changes, and justifying their reason for making these changes. *Following this unit, learners will further develop their digital writing skills in the Year 3 – 'Desktop publishing' unit and the Year 6 – 'Web page development' unit.*
Creating content	<u>Creating media – digital painting</u> Explore the world of digital art and its exciting range of creative tools with your learners. Empower them to create their own paintings, while getting inspiration from a range of other artists. Conclude by asking them to consider their preferences when painting with, and without, the use of digital devices.	-Use technology purposefully to organise, store and retrieve digital content. **Art and Design** -To develop a wide range of art and design techniques in using colour, pattern, texture, line, shape, form, and space -About the work of a range of artists, craft makers, and designers, describing the differences and similarities between different practices and disciplines and making links to their own work (Illustrate the story typed as part of previous unit using Purplemash)	Learners should be familiar with: How to switch their device on Usernames Passwords For an introduction to keyboard and mouse skills, learners may benefit from completing the Year 1 Computing Systems & Networks unit prior to this unit.

Programming, Problem solving	<u>Programming B: introduction to animation</u> This unit introduces learners to on-screen programming through ScratchJr. Learners will explore the way a project looks by investigating sprites and backgrounds. They will use programming blocks to use, modify, and create programs. Learners will also be introduced to the early stages of program design through the introduction of algorithms.	-Understand what algorithms are. -Understand how algorithms are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. -Create and debug simple programs. -Use logical reasoning to predict the behaviour of simple programs.	This unit progresses learners' knowledge and understanding of programming and follows on from 'Programming A – Moving a robot', where children will have learned to program a floor robot using instructions.
Creating content	<u>Data and information – Grouping Data</u> This unit introduces pupils to data and information. They will begin by using labels to put objects into groups, and labelling these groups. Pupils will demonstrate that they can count a small number of objects, before and after the objects are grouped. They will then begin to demonstrate their ability to sort objects into different groups, based on the properties they choose. Finally, pupils will use their ability to sort objects into different groups to answer questions about data.	-Use technology purposefully to organise, store and retrieve digital content. **E-safety** **Copyright and ownership** -I know that work I create belongs to me -I can name my work so that others know it belongs to me	This unit will introduce learners to data and information. It will introduce learners to the concept of labelling and grouping objects based on their properties. Learners will develop their understanding that objects can be given labels, which is fundamental to their future learning concerning databases and spreadsheets. In addition, learners will begin to improve their ability to use dragging and dropping skills on a device. *Following this unit, in year 2, learners will present data graphically in pictograms.*

Computer Science aspects covered	Unit of work	Year 2 NC Objectives	Progression of skills
Using ICT beyond school	<u>Computing systems and networks – IT around us</u> How is information technology (IT) being used for good in our lives? With an initial focus on IT in the home, learners explore how IT benefits society in places such as shops, libraries, and hospitals. Whilst discussing the responsible use of technology, and how to make smart choices when using it.	-Use technology purposefully to create, organise, store, manipulate, and retrieve digital content -Recognise common uses of information technology beyond school -Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies **E-safety** **Health, well-being, and lifestyle** -I can identify rules that help keep us safe and healthy in and beyond the home when using technology -I can give some simple examples	This unit progresses learners' understanding of technology and how they interact with it. They will develop this understanding to become familiar with the term information technology and will be able to identify common features of IT. This unit also builds on the learners' understanding of using technology safely and responsibly.
Creating content	<u>Creating media – digital photography</u> 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.	-Use technology purposefully to create, organise, store, manipulate, and retrieve digital content -Recognise common uses of information technology beyond school -Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies **E-safety** **Managing online information** -To identify that some images are not real (fake)	This unit begins the learners' understanding of how photos are captured and can be manipulated for different purposes. *Following this unit, learners will develop their photo editing skills in Year 4.*
Programming, Problem solving	<u>Programming A – Robot algorithms</u> This unit develops pupils' understanding of instructions in sequences	-Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions -Create and debug simple programs	This unit progresses students' knowledge and understanding of algorithms from Y1 and how they are implemented as programs on digital devices. Pupils will spend time looking at how the order of commands

	and the use of logical reasoning to predict outcomes. Pupils will use given commands in different orders to investigate how the order affects the outcome. Pupils 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.	-Use logical reasoning to predict the behaviour of simple programs -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.	affects outcomes. Pupils will use this knowledge and logical reasoning to trace programs and predict outcomes.
Creating content	Creating media: Making music Learners will explore how music can make them think and feel. They will make patterns and use those patterns to make music with both percussion instruments and digital tools. They will also create different rhythms and tunes, using the movement of animals for inspiration. Finally, learners will share their creations and compare creating music digitally and non-digitally.	-Use technology purposefully to create, organise, store, manipulate and retrieve digital content **Music national curriculum links** -Play tuned and untuned instruments musically -Listen with concentration and understanding to a range of high-quality live and recorded music -Experiment with, create, select and combine sounds using the inter-related dimensions of music	This unit progresses students' knowledge through listening to music and considering how music can affect how we think and feel. Learners will then purposefully create rhythm patterns and music.
Creating content	Data and information: Pictograms This unit introduces the learners to the term 'data'. Learners will begin to understand what data means and how this can be collected in the form of a	-Use technology purposefully to create, organise, store, manipulate and retrieve digital content (Use Purplemash to create tally's/pictograms if mentioned program does not work)	This unit progresses students' knowledge and understanding of grouping data. It builds on the Year 1 Data and Information unit where learners labelled objects and grouped them based on different properties. *In Year 3 learners develop their understanding of attributes (properties) using branching databases to structure data according to different object attributes.*

	tally chart. They will learn the term 'attribute' and use this to help them organise data. They will then progress onto presenting data in the form of pictograms and finally block diagrams. Learners will use the data presented to answer questions.		
Programming, Problem solving	<u>Programming B – An introduction to quizzes</u> This unit initially recaps on learning from the Year 1 Scratch Junior unit 'Programming B - Introduction to animation' 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.	-Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions -Create and debug simple programs -Use logical reasoning to predict the behaviour of simple programs	This unit initially recaps on learning from the Year 1 ScratchJr unit 'Programming B – Programming animations'. This unit progresses learners' knowledge and understanding of instructions in sequences and the use of logical reasoning to predict outcomes.

Computer Science aspects covered	Unit of work	Year 3 NC Objectives	Progression of skills
Programming, Logical thinking, Creating content	<u>Computer systems and networks - Connecting computers</u> Challenge your learners to develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. Start by comparing digital and non-digital devices, before introducing them to computer networks that include network infrastructure devices like routers and switches.	Use sequence, selection, and repetition in programs; work with variables and various forms of input and output -Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication and collaboration -Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information **Maths (Lesson 1)** **-Number and place value:** solve number problems and practical problems involving these ideas. **Art (Lesson 3)** -To improve their mastery of art and design techniques, including drawing, painting and sculpture with a range of materials [for example, pencil, charcoal, paint, clay]	This unit progresses learners' knowledge and understanding of technology by focusing on digital and non-digital devices, and introducing the concept of computers connected together as a network. Following this unit, learners will explore the internet as a network of networks.
Creating content	<u>Creating media- Animation</u> 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.	-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. **E-safety** **Managing online information** -I can use key phrases in search engines.	This unit progresses students' knowledge and understanding of using digital devices to create media, exploring how they can create stop-frame animations. *Following this unit, learners will further develop their video editing skills in Year 5.*

		-I can use search technologies effectively. **Copyright and ownership** -I can explain why copying someone else's work from the internet without permission can cause problems. -I can give examples of what those problems might be. -When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it. -I can give some simple examples. -I can give examples of content that is permitted to be reused. -I can demonstrate the use of search tools to find and access online content which can be reused by others.	
Creating content, Searching	<u>Creating media – Desktop publishing</u> During this unit, learners will become familiar with the terms 'text' and 'images' and understand that they can be used to communicate messages. They will use desktop publishing software and consider careful choices of font size, colour and type to edit and improve premade documents. Learners will be introduced to the terms 'templates', 'orientation', and 'placeholders' and begin to understand how these can support them in making their own template for a magazine front cover. They will start to add text and images to create their own pieces of work using desktop	-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. **E-safety** **Managing online information** -I can use key phrases in search engines -I can use search technologies effectively **Copyright and ownership** -When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it -I can demonstrate the use of search tools to find and access online content which can be reused by others	This unit progresses learners' knowledge and understanding of using digital devices to combine text and images building on work from the following units; Digital Writing Year 1, Digital painting Year 1, and Digital Photography Year 2.

	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.		
Creating content	<u>Data and information – Branching databases</u> 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.	-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	This unit progresses students' knowledge and understanding of presenting information. It builds on their knowledge of data and information from key stage 1. They continue to develop their understanding of attributes and begin to construct and interrogate branching databases as a means of displaying and retrieving information.
Problem solving, Programming, Logical thinking, Creating content	<u>Programming A – Sequence in music</u> 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	-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	This unit builds upon prior experience of programming; the KS1 programming units covering floor robots and ScratchJr.

	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.	-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	
Problem solving, Programming, Logical thinking, Creating content	<u>Programming B – Events and actions</u> This unit explores the links between events and actions, whilst consolidating prior learning relating to sequencing. Learners will begin by moving a sprite in four directions (up, down, left and right). They will then explore movement within the context of a maze, using design to choose an appropriately sized sprite. This unit also introduces programming extensions, through the use of pen blocks. Learners are given the opportunity to draw lines with sprites and change the size and colour of lines. The unit concludes with learners designing and coding their own maze tracing program.	-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	This unit builds upon prior experience of programming. The KS1 units focus on floor robots and ScratchJr and the Year 3 — Programming A unit introduces the Scratch programming environment and the concept of sequences.

Computer Science aspects covered	Unit of work	Year 4 NC Objectives	Progression of skills

Logical thinking, Searching, creating content	<u>Computing systems and networks – The Internet</u> Learners will apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet, and will be given opportunities to explore the World Wide Web for themselves in order to learn about who owns content and what they can access, add, and create. Finally, they will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information. This unit requires devices with an internet connection. Chrome Music Lab is used in one lesson to demonstrate content which can be produced on the World Wide Web	-Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration -Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content -Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of 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. **E-safety** **Managing online information** -I can analyse information to make a judgement about probable accuracy, and I understand why it is important to make my own decisions regarding content and that my decisions are respected by others. -I can explain what is meant by fake news, e.g. why some people will create stories or alter photographs and put them online to pretend something is true when it isn't. -I can describe ways of identifying when online content has been commercially sponsored or boosted, (e.g. by commercial companies or by vloggers, content creators, or influencers). -I can describe how fake news may affect someone's emotions and behaviour, and explain why this may be harmful.	This unit progresses students' knowledge and understanding of networks in Year 3. *In Year 5, they will continue to develop their knowledge and understanding of computing systems and online collaborative working.*
Creating content, Searching	<u>Creating media – audio editing</u> In this unit, learners will initially examine devices capable of recording digital	-Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	This unit progresses students' knowledge and understanding of creating media, by focusing on the recording and editing of sound to produce a podcast. *Following this unit, learners will explore combining audio*

	audio, which will include identifying the input device (microphone) and output devices (speaker or headphones) if available. Learners will discuss the ownership of digital audio and the copyright implications of duplicating the work of others. In order to record audio themselves, learners will use Audacity to produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files. Finally, learners will evaluate their work and give feedback to their peers.	-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 **Science – Year 4 (Lesson 2)** **-Sound:** Find patterns between the volume of a sound and the strength of the vibrations that produced it **-Sound:** Recognise that sounds get fainter as the distance from the sound source increases **Music – KS2 (Lesson 5)** -Improvise and compose music for a range of purposes using the interrelated dimensions of music **E-safety** **Copyright and ownership** -I can explain why copying someone else's work from the internet without permission can cause problems (Y3) -I can give examples of what those problems might be (Y3) -When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it (Y4) -I can give some simple examples (Y4)	*with video in the 'Video editing' unit in Year 5.*
Creating content, Searching	<u>Creating media – Photo editing</u> In this unit, learners will develop their understanding of how digital images can be changed and edited, and how they can then be resaved and reused. They	-Use search technologies effectively -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	Learners should have experience of making choices on a tablet/computer. They should be able to navigate within an application. This unit progresses students' skills through editing digital images and considering the impact that editing can have on an image. Learners will also consider how editing can be used appropriately for different

	will consider the impact that editing images can have, and evaluate the effectiveness of their choices.	-Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. **E-safety:** **Self-image and identity** -I can describe ways in which people might make themselves look different online. **Copyright and ownership** -When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it.	scenarios, and create and evaluate 'fake' images, combining all of their new skills.
Programming, Creating content	<u>Data and information – Data logging</u> In this unit, pupils will consider how and why data is collected over time. Pupils will consider the senses that humans use to experience the environment and how computers can use special input devices called sensors to monitor the environment. Collect data as well as access data captured over long periods of time. Look at data points, data sets, and logging intervals. Spend time using a computer to review and analyse data. Towards the end of the unit, pupils will pose questions and then use data loggers to automatically collect the data needed to answer those questions.	-Work with various forms of input -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	This unit progresses pupils' knowledge and understanding of data and how it can be collected over time to answer questions. The unit also introduces the idea of automatic data collection.

Problem solving, Programming, Creating content	<u>Programming A – Repetition in shapes</u> This unit is the first of the two programming units in Year 4, and looks at repetition and loops within programming. Pupils will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language.	-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	This unit progresses students' knowledge and understanding of programming. It progresses from the sequence of commands in a program to using count-controlled loops. Pupils will create algorithms and then implement those algorithms as code.
Problem solving, Programming, Logical thinking, Creating content	<u>Programming B – Repetition in games</u> This unit explores the concept of repetition in programming using the Scratch environment. It 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.	-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	This unit builds upon pupils prior experience of programming. The KS1 units cover floor robots and ScratchJr, and Scratch is introduced in Year 3 programming units.

Computer Science aspects covered	Unit of work	Year 5 NC Objectives	Progression of skills
Problem solving, Programming, Creating content,	<u>Computing systems and networks – sharing information</u> In this unit, learners will develop their understanding of computer systems and how information is transferred between systems and devices. Learners will consider small-scale systems as well as large-scale systems. They will explain the input, output, and process aspects of a variety of different real-world systems. Learners will also take part in a collaborative online project with other class members and develop their skills in working together online.	-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 -Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration -Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information -Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact **E-safety** **Copyright and ownership:** -I can assess and justify when it is acceptable to use the work of others -I can give examples of content that is permitted to be reused	This unit progresses learners' knowledge and understanding of computing systems and online collaborative working.
Creating content	<u>Creating media – Vector Drawing</u> In this unit learners will find out that vector images are made up of shapes. They will learn how to use the different drawing tools and how images are created in	-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. **E-safety** **Copyright and ownership**	This unit progresses students' knowledge and understanding of digital painting and has some links to desktop publishing in which learners used digital images. They are now creating the images that they could use in desktop publishing documents.

	layers. They will explore the ways in which images can be grouped and duplicated to support them in creating more complex pieces of work. This unit is planned using the Google Drawings app other alternative pieces of software are available.	-I can explain why copying someone else's work from the internet without permission can cause problems.	
Searching, Creating content	<u>Creating media – video editing</u> This unit gives learners the opportunity to learn how to create short videos in groups. As they progress through this unit, they will be exposed to topic-based language and develop the skills of capturing, editing, and manipulating video. Active learning is encouraged through guided questions and by working in small groups to investigate the use of devices and software. Learners are guided with step-by-step support to take their idea from conception to completion. At the teacher's discretion, the use of green screen can be incorporated into this unit. At the conclusion of the unit, learners have the opportunity to reflect on and assess their progress in creating a video.	-Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content -Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information -Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	This unit progresses learners' knowledge and understanding of creating media by guiding them systematically through the process involved in creating a video. The unit builds on the Year 4 unit 'Photo editing' where composition is introduced and the Year 3 unit 'Stop-frame animation' where learners explored some of the features of video production. By the end of this unit, learners will have developed the skills required to plan, record, edit, and share a video.

Searching, Creating content	<u>Data information – flat-file database</u> This unit looks at how a flat-file database can be used to organise data in records. Pupils use tools within a database to order and answer questions about data. They create graphs and charts from their data to help solve problems. They use a real-life database to answer a question, and present their work to others.	-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	This unit progresses pupils' knowledge and understanding of why and how information might be stored in a database, and looks at how tools within a database can help us to answer questions about our data. It moves on to demonstrate how a database can help us display data visually, and how real-life databases can be used to help us solve problems. Finally, the pupils create a presentation showing understanding and application of all the tools used within the unit.
	<u>Programming A – Selection in physical computing</u> In this unit, learners will use physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. Learners will be introduced to a microcontroller (Crumble controller) and learn how to connect and program components (including output devices- LEDs and motors) through the application of their existing programming knowledge. Learners are introduced to conditions as a means of controlling the flow of actions and make use of	-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 **<u>Science – Electricity (Year 4)</u>** -Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers	This unit builds upon pupils prior experience of programming using block-based construction (e.g. Scratch) and understand the concepts of sequence and repetition. The key stage 1 units focus on floor robots and ScratchJr.

	their knowledge of repetition and conditions when introduced to the concept of selection (through the if, then structure)		
Problem solving, Programming, Logical thinking	<u>Programming B – selection in quizzes</u> In this unit, pupils develop their knowledge of selection by revisiting how conditions can be used in programs and then learning how the If… Then… Else structure can be used to select different outcomes depending on whether a condition is true or false. They represent this understanding in algorithms and then by constructing programs using the Scratch programming environment. They use their knowledge of writing programs and using selection to control outcomes to design a quiz in response to a given task and implement it as a program.	-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	This unit builds upon pupils prior experience of programming using block-based construction (eg Scratch), understand the concepts of 'sequence' and 'repetition', and have some experience of using 'selection'. Ideally, learners will have completed 'Programming A – Selection in physical computing' before undertaking this unit, as this will provide them with the required knowledge of 'selection'.

Computer Science aspects covered	Unit of work	Year 6 NC Objectives	Progression of skills
Problem solving, Logical thinking, Searching,	<u>Computing systems and networks – communication</u> In this lesson, learners will use information provided and their own prior knowledge to categorise different forms of internet communication. They will then choose which method they would use for the scenarios discussed in the previous lesson. During these activities, they will explore issues around privacy and information security.	-Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts -Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration -Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content -Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of 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 **E-safety** **Managing online information** -I can describe and assess the benefits and the potential risks of sharing information online. -I can use various additional tools to refine my searches (e.g. search filters: size, type, usage rights etc.). -I can explain how to use search effectively and use examples from my own practice to illustrate this. -I can explain how search engine rankings are returned and can explain how they can be influenced (e.g. commerce, sponsored results).	This unit progresses students' knowledge and understanding of computing systems and online collaborative working.

Creating content	Creating media – 3D modelling During this unit, learners will develop their knowledge and understanding of using a computer program (Tinkercad) to produce 3D models. Learners will initially familiarise themselves with working in a 3D space, including combining 3D objects to make a house and examining the differences between working digitally with 2D and 3D graphics. Learners will progress to making accurate 3D models of physical objects, such as a pencil holder, which include using 3D objects as placeholders. Finally, learners will examine the need to group 3D objects, then go on to plan, develop, and evaluate their own 3D model of a photo frame.	-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 **Art and design – KS2** -To improve their mastery of art and design techniques, including drawing, painting and sculpture with a range of materials **Design and technology – KS2** -Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design **Mathematics – KS2** -Recognise, describe and build simple 3D shapes, including making nets	This unit progresses students' knowledge and understanding of creating 3D graphics using a computer. Prior to undertaking this unit, learners should have worked with 2D graphics applications.
Searching, Creating content	Creating media – web page creation This unit introduces learners to the creation of websites for a chosen purpose. Learners identify what makes a good web page and use this information to design and evaluate their own website using Google Sites. Throughout the process learners pay specific	-Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content -Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information. -Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour. **English links**	This unit progresses students' knowledge and understanding of the following: digital writing, digital painting, desktop publishing, digital photography, photo editing, and vector drawing.

	attention to copyright and fair use of media, the aesthetics of the site, and navigation paths.	-Writing composition: Identifying the audience for and purpose of the writing, selecting the appropriate form, and using other similar writing as models for their own. **E-safety** **Managing online information** -I can explain how to use search technologies effectively. **Copyright and ownership** -I can demonstrate the use of search tools to find and access online content which can be reused by others. -I can demonstrate how to make references to and acknowledge sources I have used from the internet.	
Creating content	<u>Data and information – spreadsheets</u> 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	-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 **<u>Maths links</u>** **Number – addition, subtraction, multiplication, and division:** -Solve problems involving addition, subtraction, multiplication, and division **Statistics:** -Interpret and construct pie charts and line graphs, and use these to solve problems -Calculate and interpret the mean as an average **E-safety** **Managing information online** -I can describe how I can search for information within a wide group of technologies (e.g. social media, image sites, video sites) -I can use different search technologies	This unit progresses students' knowledge and understanding of data, and teaches them how to organise and modify data within spreadsheets.

	graphs and charts, and evaluate their results in comparison to questions asked.	-I can evaluate digital content and can explain how I make choices from search results	
Problem solving, Programming, Logical thinking, Creating content	<u>Programming A – Variables in games</u> This unit explores the concept of variables in programming through games in Scratch. First, pupils will learn what variables are, and relate them to real-world examples of values that can be set and changed. Pupils will then use variables to create a simulation of a scoreboard. In Lessons 2, 3, and 5, which follow the Use-Modify-Create model, pupils will experiment with variables in an existing project, then modify them, then they will create their own project. In Lesson 4, pupils will focus on design. Finally, in Lesson 6, pupils will apply their knowledge of variables and design to improve their game in Scratch	-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	This unit builds upon pupils prior experience of programming in Scratch. Specifically, they should be familiar with the programming constructs of sequence, repetition, and selection. These constructs are covered in the Year 3, 4, and 5 units respectively. Each year group includes at least one unit that focuses on Scratch.
Problem solving, Programming, Logical thinking, Creating content	<u>Programming B – Sensing</u> This unit is the final KS2 programming unit and brings together elements of all the four programming constructs: sequence from	-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	This unit builds upon pupils confident understanding of sequence, repetition and selection independently within programming.

	year 3, repetition from year 4, selection from year 5 and variables, introduced in year 6, programming A. It offers learners the opportunity to use all of these constructs in a different, but still familiar environment whilst also utilising a physical device - the micro:bit. The unit begins with a simple program which learners build in and test in the programming environment before transferring it to their micro:bit. Learners then take on three new projects in lessons 2, 3 and 4, with each lesson adding more depth.	-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	