Computing Overview

National Curriculum Coverage, Progression in Skills and Knowledge and Supporting Resources/Schemes of Work

EYFS

	3 & 4-year-olds will be learning to:	Children in Reception will be learning to:	ELG
Personal, social and emotional	● Select and use activities and resources with help ● To use large and small motor skills to do things independently	● To show resilience and perseverance	● Be confident to try new activities and show independence, resilience and perseverance in the face of challenge ● Work and play cooperatively with others
Maths	● Selecting shapes ● Recall of numbers ● Describe a familiar route ● Making comparisons	● Subitise ● Make comparisons ● Directions ● Positional language	● To explore and represent pattern ● To compare quantities ● Subitise
Understanding the World	● Explore how things work	● Draw information from a simple map ● Comment on images	● Look at different environments, maps etc
Expressive art and design	● Listen with increased attention to sound ● Respond to what they have heard ● Draw with increasing complexity and detail ● Develop their own ideas	● Return to and build on ideas ● Watch and talk about dance and performance ● Listen attentively and respond to music	● Exploring tools and techniques ● Experiment with colour, design, form and function

Early Years

What computing looks like in the EYFS
Characteristics of Effective Learning: Playing and exploring - children investigate and experience things and have a go; Active learning - children concentrate and keep trying if they encounter difficulties and enjoy achievements; Creating and thinking critically - children have and develop their own ideas, make links between ideas and develop strategies for doing things. In addition, the prime areas of learning PSE, CL, and PD underpin and are an integral part of all areas of learning.
The most relevant statements for computing are taken from the following areas of learning: ● Personal, Social and Emotional Development ● Physical Development ● Understanding the World ● Expressive Arts and Design ● Mathematical Development
Intent: At Co-op Academy Penny Oaks we develop the foundational skills of computing. We hope to develop safe, responsible and competent learners who can navigate and investigate using technology. For children to develop the knowledge and skills they need to keep themselves safe online and to prepare children for the pivotal role technology will play in their lives, both as children and adults.

Algorithms	Creating programs	Using technology	Use of IT beyond school	Safe use
Develops digital literacy skills by being able to access, understand and interact with a range of technologies	Completes a simple program on electronic devices	Can create content such as a video recording, stories, and/or draw a picture on screen	Begin to list different IT in their home	Begin to give reasons why we need to stay safe online Can use the internet with adult supervision to find and retrieve information of interest to them

Themes	Autumn Who Am I?	Spring Amazing Nature/Ready Steady Cook (Nursery cycle B)	Summer All Creatures Great and Small/ Land of Make Believe (Nursery cycle B)
Learning Overview	We will begin exploring a range of technological equipment and think about operating equipment in the provision e.g. playing on the interactive white board and using the touch screen computers.	We will discuss the importance of internet safety and what we should do if we face an issue. We will play games to enhance others areas of learning, such as art and mathematics	We will think about what technology we use at home and why it is useful and important. We will explore directions and basic coding using the bee-bots.
Computing We revisit knowledge and skills throughout the year	To show resilience and perseverance in the face of a challenge. To know and talk about the different factors that support their overall health and wellbeing: -sensible amounts of 'screen time'. To develop their small motor skills so that they can use a range of tools competently, safely and confidently . To explore, use and refine a variety of artistic effects to express their ideas and feelings. To discuss online safety and give reasons why we need to stay safe online. To develop digital literacy skills. To complete a simple program on electronic devices. To create content such as sequence stories, and/or draw a picture on screen. To begin to identify different IT in their home. To use the internet with adult supervision to find and retrieve information of interest to them.		
	A range of technology is available within the classroom for children to access, both independently and with an adult: Laptops – games / activities linked to the topic or maths being covered each week/information gathering. Play with remote control toys e.g. cars. Play with battery operated toys. Play with Walkie Talkies. Operate humanbots (us) and Beebots - include a simple direction. Interactive white boards – Phonics Play / Topmarks / Google Earth / Digimap./drawing. iPads – taking photographs, watching video clips, listening to music. Sound buttons – children can listen to a pr-recorded challenge or record their own answers.		
Key Vocabulary	Computer, laptop, iPad, camera, recording, mouse, programme, hardware, software, coding, technology		

Year 1

Theme	National Curriculum	Progression in Skills	Disciplinary Knowledge	Substantive knowledge			Drivers & 50 things	British Values & Protective Characteristics	Schemes/Resources/ Texts
				Key Questions	Key Facts	Key Vocab			
Autumn 1 **Computer Science**	Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs. Recognise common uses of information technology beyond school.	Sequence a series of pre-written instructions to create an algorithm. Break an activity down into simple steps Independently list the steps in their own algorithms, test them and correct any mistakes Combine more than one command into a device to make a simple program	Children learn that an algorithm is a set of rules or instructions written to perform a task. Children will create a set of instructions on how to draw a crazy character starting to understand what algorithms are. Children use positional and directional language to control movements of other pupils which are written as algorithms. Children tinker with digital devices and describe how the various controls affect the device. Predict and test what would happen if a few of these commands were sequenced together to control various physical and virtual devices.	What is an algorithm? How do the controls affect the device?	Digital devices work by processing information based on a sequence of instructions called a program.	Debug Computer Algorithm			[Lolly Stick Puppet Algorithms CS1] [Crazy Character Algorithms – Barefoot] [CS1 Human Robot Mazes] [CS2 Tinkering Time] Beebots
				Possible Misconceptions: Children might mix up left and right commands When programming left or right they may assume the device will move in that direction instead of just turning.					
Autumn 2 **Digital Literacy**	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. Recognise common uses of information technology beyond school	To use the keyboard to type words on a screen To find and understand examples of where technology is used in the local community Consider types of technology used in school and out of school. To record examples of technology outside school.	Children will follow a simple program to learn how to use different keys on a keyboard. Children will identify different forms of technology in the classroom and in the local environment. Children explore what different items of technology do. Children explain what different items of technology are used for.	What is technology?	The internet helps us to find out information about lots of different facts.	Computer Technology Keyboard Keys Space bar			[Online stacking cups typing game] Chromebooks [Purple Mash – Unit 1.9 Technology outside school] [Lesson 1] [Lesson 2]
				Possible Misconceptions: Children might think that technology is just computing devices but is actually anything that has been invented/created.					

Oracy opportunities for Autumn term	Problem Solving- Debugging an Algorithm (Paired discussion)								
Spring 1 **Media**	Use technology purposefully to create, organise, store, manipulate, and retrieve digital content	Use the shape tool and the line tools Make careful choices when painting a digital picture Explain why a tool was used Use a computer independently to paint a picture Compare painting a picture on a computer and on paper	Children will be introduced to the freehand tools available for digital painting. Children will be introduced to the line and shape tools to create their own digital painting in the style of an artist. Children will use a range of shape tools, to create a painting in the style of an artist. Children will select the best tools to create a digital painting in the style of Wassily Kandinsky. Children will select appropriate colours, brush sizes, and brush tools to independently create their own image in the style of an artist. Children will compare their preferences when creating paintings on computers and on paper.	How can we paint using computers?	Computers can be used to create art.	Tool Erase Fill Undo **Possible Misconceptions:** Children might think digital art involves less skill and practice than traditional art. Children think digital art entails expensive software and gadgets to produce great work.			Creating Media – Digital Painting (NCCE) Lesson 1 - How can we paint using computers? Lesson 2 - Using shape and lines Lesson 3 - Digital Painting Lesson 4 - Digital Painting Lesson 5 - Digital painting Lesson 6 - Digital Painting Paintz.app
Spring 2 **Data Handling**	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	Sort and classify objects based on their properties. Create a simple pictogram Create a pictogram and to interpret the data it represents. Change the data independently in a	Children will sort various items offline using a variety of criteria. Children will sort various items online using a variety of criteria. Children will collect data from the class to put into a pictogram	How can we sort objects? What is a pictogram? What is data?	We can use different criteria to sort objects.	Sort Criteria Pictogram Data		Careers/ Aspirations week STEM visit	Purple Mash – Unit 1.2 - Grouping and Sorting Lesson 1 Lesson 2 Purple Mash - Unit 1.3 Lesson 1 Lesson 2

	concerns about content or contact on the internet or other online technologies.	pictogram and comment on the effects of the changes.	Children will be able to explain what the data in a pictogram means Children will collect simple data and create their own pictograms	**Possible Misconceptions:** Children may think they need to have the same number of objects under each criterion but they do not. Children may not think that some objects can be sorted into more than one criterion.				Lesson 3 Sorting rings Chromebooks
Oracy opportunities for spring term	Discussion- How many ways can shapes be sorted?							
Summer 1 **Computer Science**	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	Create and debug simple programs & algorithms to achieve an outcome. Recognise common uses of technology in and beyond school and understand they are controlled by programs	Children will practise programming Bee Bots to navigate around a simple cone maze. Children will convert written algorithms into programs in Scratch Junior. Children will create a collage to show some devices used at home. Children will talk about the different parts of devices and how they are controlled by programs that tell them what to do. Children will label the different parts of a device and create a simple algorithm to show how it works.	How does the BeeBot work? What do the blocks do? What is code?	We program commands to make the Beebots move. A block is a command in Scratch Junior. You need to put blocks in the correct order of the algorithm. Blocks	Blocks		CS3 Floor Robot Mazes CS3 – Programs in Scratch Junior Part 1 BeeBots – will need new batteries CS4 Technology at home Scratch Junior on ipads
				Possible Misconceptions: Children may not realise they need to clear the memory before retrying programming the Beebot otherwise it will store all previous commands				
Summer 2 **Media**	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.	Communicate simple ideas through the use of text, images. Type a phrase with spaces between letters. Add text to images or images to text. Change font, size colour and style appropriately	Children will compare traditional story books with e-books. Children will start to create their own digital character. Children will begin to add animation to their character. Children will begin to add sound to their character page. Children will independently create a retell of a story they have shared as a class.	What is the difference between a traditional book and an e-book? What makes a good sound effect? How do you change the font style and size?	To change the font and size of writing you must highlight what you want to change first.	E book Insert Animation Paste Font		Purple Mash Unit 1.6 - Animated Story books Lesson 1 Lesson 2 Lesson 3 Lesson 4 Lesson 5 2Create

		Understand sound and music can be created using a range of simple technology Record sound using simple technologies and play back the recordings.	Children will learn how to copy and paste new pages.	**Possible Misconceptions:** Children may not realise they need to keep saving new parts added to their work or it will be lost.			Chromebooks
Oracy opportunities for summer term	Discussion- what different types of technology do you use at home or in school??						

Year 2

Theme	National Curriculum	Progression in Skills	Disciplinary Knowledge	Substantive knowledge			Drivers & 50 things	British Values & Protective Characteristics	Schemes/Resources/ Texts
				Key Questions	Key Facts	Key Vocab			
Autumn 1 **Computer Science**	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 Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	Understand that more complex problems can be broken down into smaller parts Create and develop algorithms & programs to achieve pre-defined outcomes Predict the outcome of a program using logical reasoning	Children will create a sequence of movements then break the sequence of actions down into parts. Children will explore algorithms that contain several events and discuss decomposing these into sub sections. Children will create more complex programs using more tools and will decompose more tasks into smaller parts to help them achieve their goals. Children will predict what a sequence of commands will do. Children will match up algorithms to code then create	What is decomposition?	Breaking down a sequence into parts helps the design process and sharing of a sequence.	Decompose Predict Sprite		STEM visit in class	Barefoot Computing – Decomposition unplugged CS5 - Draw your own Robot CS6 - Programs in Scratch Junior CS7 - Prediction with Scratch
				Possible Misconceptions: Children may misinterpret the meaning of the different blocks within the Scratch Junior program					

			code to ask other groups to predict. Children will run each block of code to check their predictions.					
Autumn 2 **Digital Literacy**	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	To recognise the uses and features of information technology To identify the uses of information technology in the school To identify information technology beyond school To explain how information technology helps us To explain how to use information technology safely Torecognise that choices are made when using information technology	Children will identify devices that are computers and consider how IT can help them both at school and beyond. Children will identify examples of IT and be able to explain the purpose of different examples of IT in the school setting. Children will explore IT in environments beyond school including home and familiar places such as shops. Children will sort activities based on whether they use IT or not and say why we use IT. Children will list different uses of IT and talk about the different rules that might be associated with using them.	What is information technology? What activities can we use computers for? **Possible Misconceptions:** Children may not know that technology is used in all areas of our lives outside of the home. Children may not know that some online games have an age limit and why.	Barcodes are scanned using a scanner.	Barcode Scanner Scan			IT around us - (NCCE) Lesson 1 - What is IT? Lesson 2 - IT in school Lesson 3 - IT in the World Lesson 4 - The benefits of IT Lesson 5 - Using IT safely Lesson 6 - Using IT in different ways
Oracy opportunities for Autumn term	Problem Solving- Debugging an Algorithm (Paired discussion)								
Spring 1 **Media**	Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Create, edit and format a range of digital texts.	Children will be creating their own multimedia diary entry.	What is the shift key used for?	The shift key can be used to create capital letters when pressed with a letter key.	Align			MM6 - Edit digital text MM10 - Multi media diary

		Combine and share digital content from multiple sources	Children will create a front cover with title and pictures Children will create text changing the font, colour and size. Children will create audio recordings to add to their diaries. Children will add pages to their diary		The shift key can also be used for adding punctuation to your text.				
				Possible Misconceptions: Children might think that all screens are touch screens. When using a desktop computer and some laptops they will need to see a keyboard and a mouse to move things or input information. Children might try to close the screen on a desktop as they do when closing a laptop. Desktop monitors do not need to be folded down onto the desk.					
Spring 2 **Data Handling**	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.	Create a simple graph (the data may be given to the pupil) Collect data and display it in the form of a graph Write questions based on a graph they have created	Children will look at what information cannot be answered from a pictogram. Children will use a range of Yes/No answers to sort different pictures. Children will design a binary tree to sort pictures as a class. Children will use the binary tree to answer questions to find a specific picture. Children will use a database to answer more complex search questions.	How does a pictogram show information? How is information organised in a binary tree? How can a database help organise information?	A Binary Tree is a simple way of sorting information into two categories. A database is a computerised system that makes it easy to search, select and store information.	Binary Tree Database Field Record Search Sort		Careers/ Aspirations week STEM visit	Purple Mash – Unit 2.4 Questioning Lesson 1 Lesson 2 Lesson 3 Lesson 4 Lesson 5
				Possible Misconceptions: Children may not understand how to construct a question than will only give a Yes/No answer					
Oracy opportunities for spring term									
Summer 1 **Computer Science**	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	Demonstrate the ability to debug predefined programs. Identify digital technologies around us and describe how they work	Children will identify what a program should do if it is working properly, observe what actually happens in the program, identify the parts that don't work and debug the code to correct the error.	What controls digital technology?	Some bugs in programs are to do with the order of commands. All digital technology is controlled by a program.	Commands Code			CS8 - debugging strategies Barefoot Computing - Scratch Junior Knock Knock CS9 - Technology Around Us (Inputs and Outputs) Book Creator Scratch Junior

<table>
<tr><td></td><td>Use logical
reasoning to predict the
behaviour of simple programs

Recognise common uses
of information technology beyon
d school</td><td></td><td>Children will create a simple animation program of a knock knock joke in ScratchJr, debugging it and evaluating it.

Children will identify the inputs and outputs on the digital device and create simple algorithms describing how they work.</td><td colspan="3">Possible Misconceptions:

Children do not always understand what is classed as an input such as pressing a switch, pressing a key, speaking into a microphone etc

Children sometimes struggle to identify what the output is such as a sound, movement, text on a screen etc</td><td></td><td></td><td></td></tr>
<tr><td>Summer 2

Media</td><td>Use technology purposefully to create, organise, store, manipulate and retrieve digital content.</td><td>Create and edit 2D images.

Create, capture, review and edit digital content.
Create on-screen animations to illustrate a concept.</td><td>Children will learn how to edit photos

Children will add filters to emphasise different emotions to photos

Children will use technology to record noun phrases over images they are given and save as a video.

Children will use technology to record noun phrases over images they have taken themselves.

Children will create on screen animations to illustrate seasonal change.</td><td>How do filters change photos?

Possible Misconceptions:</td><td>Filters can change the way we see a picture.</td><td>Crop
Filters
Frame</td><td></td><td></td><td>MM7 - Editing photos (cropping)

MM7 - Editing photos (filters)

MM8 - Recording noun phrases

MM9 - On screen animations

Ipads

Seesaw</td></tr>
<tr><td>Oracy opportunities for summer term</td><td colspan="8">Discussion- When might you need to use filters on photos?</td></tr>
</table>

Year 3

Theme	National Curriculum	Progression in Skills	Disciplinary Knowledge	Substantive knowledge			Drivers & 50 things	British Values & Protective Characteristics	Schemes/Resources/ Texts
				Key Questions	Key Facts	Key Vocab			
Autumn 1 **Computer Science**	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 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	Understand that all computers allow data to be input, processed and output. Understand all computer systems need programs / software to work. Decompose and sequence a range of algorithms & programs. Create and refine programs that use simple inputs and output to control events.	Children will learn that computers work using an Input-Process–Output sequence and then identify devices that are used for inputs and outputs. Children will discuss and describe the positive and negative impacts of using digital technology on a balanced lifestyle. Children will create an algorithm to explain how an animation works and then create the animation. Children will identify specific input and output devices such before learning several devices have inputs and outputs built into them.	What is a computer? How do different devices work?	An input device sends information into a computer and an output device sends information out from a computer.	Input Process Output Hardware Software		STEM visit in class	CS10 - What is a Computer? CS12 - Animating parts of a plant CS13 - What are Inputs and Outputs? Scratch Junior
				Possible Misconceptions: Children might struggle to decompose an algorithm fully and understand which blocks they need. Children might code an algorithm without the green flag to start. They need to know that the green flag block is what tells the programme to start working					

Autumn 2 **Digital Literacy**	Use search technologies effectively, appreciate how results are selected and ranked. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Follow a process Explain what makes a secure password Recognise similarities between using digital devices and using non-digital tools Suggest differences between using digital devices and using non-digital tools Explain how messages are passed through multiple connections Recognise that a computer network is made up of a number of devices Demonstrate how information can be passed between devices Explain the role of a switch, server, and wireless access point in a network Identify how devices in a network are connected together	Children will be introduced to the concepts of input, process, and output and how to protect devices using secure passwords. Children will apply understanding to devices and parts of devices that they will be familiar with from their everyday surroundings. Children will compare and contrast using digital devices and non-digital tools. Children will learn how and why computers are joined together to form networks. Children will examine devices' functionality and look at the benefits of networking computers. Children will look at examples of network infrastructure in a real-world setting.	Are there times when it is better to use a non-digital tool rather than a digital device? How can we share information effectively between connections? How does a file travel from one computer to another?	When one computer wants to send information to another computer, it can now do so via the network switch. A Wi-Fi connection is not an internet connection; it's just a wireless way of connecting to a network. Digital device Digital devices are all forms of information technology, and their purpose is to help us to complete certain tasks.	cyber attack connection network network switch server network sockets			NCCE - Computing systems and networks – Connecting computers Lesson 1 - How does a digital device work? Lesson 2 - What parts make up a digital device? Lesson 3 - How do digital devices help us? Lesson 4 - How am I connected? Lesson 5 - How are computers connected? Lesson 6 - What does our school network look like?
				Possible Misconceptions: Children may not realise that from one input there can be several outputs. Children may think that when they save documents to a computer that it will only be on that computer. They need to know if they are logged in to the network with their own username and password, they can access their document from any computer.					
Oracy opportunities for Autumn term									
Spring 1 **Media**	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	Create and amend a range of texts for a specific purpose. Create and combine visual media to meet a specific need.	Children will examine newspaper front pages and decompose them to find the elements they use. Children will create their own newspaper front page using the decomposed elements.	What elements are used in a newspaper?	We use copy and paste if we want to keep the text we are copying.	Columns Cut Shot Instructional film storyboard			MM11 - Newspaper front page MM11 - Cut, copy, paste MM12 - Instructional videos
				Possible Misconceptions: Children may not know they need to highlight text to change the font, size etc					

<table>
<tr><td></td><td></td><td></td><td>Children will use cut and paste to sequence some text and use copy and paste to add text to a document to create a newspaper report.

Children will break down an instructional video to see the constituent parts.

Children will make their own instructional video by combining videos.</td><td colspan="3">Children may not realise that where the cursor flashes on a document is where the text will start. They can move the cursor to where they want their text to start.</td><td></td><td></td><td></td></tr>
<tr><td>Spring 2

Data Handling</td><td>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</td><td>Create simple graphs using ICT to organise, present and understand data.

Answer questions in an existing database

Be able to search a database using more than one search term.</td><td>Children will understand how YES/NO questions are structured and answered.

Children will be able to explain why they choose a particular question to split their database.

Children will learn how to create a branching database.

Children will design their own branching database.

Children will create their own branching database.</td><td>What is a branching database?</td><td>Branching databases are used to classify groups of objects.</td><td>Branching Database

Possible Misconceptions:

Children might think every question relates to all the objects to be sorted instead of the ones it breaks into once the previous question has been answered.</td><td></td><td>Careers/ STEM visit</td><td>Purple Mash Unit 3.6 Branching Databases

Lesson 1

Lesson 2

Lesson 3

Lesson 4</td></tr>
<tr><td>Oracy opportunities for spring term</td><td colspan="8"></td></tr>
</table>

Summer 1 **Computer Science**	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	Understand and use the concept of repetition to write more efficient code.	Children will explore how Scratch works and compare it to Scratch Junior. Children will design algorithms to draw patterns made of simple shapes. Children will write a Scratch program to draw their shapes using repetition. Children will animate characters in Scratch using forever loops and count controlled loops (repeat x times) to create 2D shapes. Children will examine examples of art that use repetition and use their understanding to create their own examples.	What is the difference between 'repeat forever' and 'repeat until'?	Repeats are also known as loops.	Repetition Loop Flowchart			Barefoot computing - Shapes and Crystal Flowers CS14 - Understanding Repetition CS14 - Repetition in programming CS14 - Repetition through Art Scratch
				Possible Misconceptions: Pupils may think that computers act on their own and not recognise that they will only output what has been input					
Summer 2 **Media**	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	Create audio recordings to meet a specific need. Create, edit and annotate a range of 2D images. Combine digital content from different sources using appropriate layout.	Children will listen to performance poetry and evaluate it. Children will perform their own performance poetry and use technology to record their performance. Children will use an online room planning tool to experiment with 2D room design. Children will use software to create a 2D plan. Children will learn how to use image editing to create a green screen style picture.	What is a 2d plan? What is 3d design?	A 2d plan is called a plan view or a bird's eye view. 3D design software allows us to create objects in 3D such as characters in films and games. Visual media clips do not have to be created in the sequence they might appear in the final visual media production.	Clip Copyright Resize Rotate Duplicate			MM13 - Performance poetry MM14 - Creating Plan views MM15 - Editing images and adding print https://roomstyler.com/3dplanner
				Possible Misconceptions: Pupils may have misconceptions around rotation and the number of rotations needed					
Oracy opportunities									

Year 4

Theme	National Curriculum	Progression in Skills	Disciplinary Knowledge	Substantive knowledge			Drivers & 50 things	British Values & Protective Characteristics	Schemes/Resources/ Texts
				Key Questions	Key Facts	Key Vocab			
Autumn 1 **Computer Science**	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 the composition of a range of programs by decomposing them into their key components Understand and apply the concept of selection in their own algorithms and programs Predict what a specific piece of code will do and alter it to achieve a chosen outcome	Children will explore a range of programs and decompose the programs into their key components. Children will learn more about debugging strategies before finding and correcting bugs in existing programs. Children will explore selection (if X happens do Y) in the real world. Children will create flowcharts based on real life events that include examples of selection. Children will learn how to build a simple program that involves selection.	What are the PEGI age ratings for the games you play? Why do we use selection in programming?	Logical reasoning enables us to analyse things and make predictions. Algorithms and programs can be more complicated and steps don't always appear in a straight line. Sometimes things happen in programs that make events take place.	Selection		STEM visit in class	CS15 - Breaking Down Programs CS16 - Understanding Selection (part 1) CS16 - Understanding Selection (part 2) CS16 - Understanding Selection (part 3) Barefoot computing - Bug in the Water Scratch
				Possible Misconceptions: Pupils may have misconceptions around debugging and that a device will only output what has been input					
Autumn 2 **Digital Literacy**	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	To describe how networks physically connect to other networks To recognise how networked devices make up the internet To outline how websites can be shared via the World Wide Web (WWW) To describe how content can be added and accessed on the World Wide Web (WWW) To recognise how the content of the WWW	Children will explore how a network can share messages with another network to form the internet. Children will explain how the internet lets us view the World Wide Web and recognise that the World Wide Web is part of the internet which contains websites and web pages. Children will understand what can be shared on the World Wide Web and where websites are stored and how it can be accessed on a variety of devices.	What does WWW stand for? Who owns the web?	There are multiple services which can be accessed using the internet. The internet is connected by many routers.	Internet Network Router Server wireless access point (WAP)			NCCE – The Internet Lesson 1 - Connecting Networks Lesson 2 - What is the internet made of? Lesson 3 - Sharing Information Lesson 4 - What is a website? Lesson 5 - Who owns the Web? Lesson 6 - Can I believe what I read?

	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.	is created by people To evaluate the consequences of unreliable content	Children will consider what content can be added to websites and what factors they should consider before adding content to a website. Children will explore who owns the content on the World Wide Web and websites investigating what can and cannot be done with the content on them.	**Possible Misconceptions:** Children may not realise that routers connect networks. They can let information through or can block information being passed on. Physical things cannot be shared online but pictures of them can. Everything online is the truth. Google own the internet - No-one owns the internet			
Oracy opportunities for Autumn term	Discussion: computers can replace teachers							
Spring 1 **Media**	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.	Understand and apply design criteria to their digital content. Understand how the composition of visual media can affect how it is interpreted.	Children will examine examples of good and bad poster design to identify the important elements Children will use the features of a good poster design to design their own poster. Children will learn about different camera shots and practice using them. Children will create a short two part sentence and plan how it will be filmed. Children will combine the different camera shots to make a very short film.	How can camera shots, image composition and visual effects help to create effective still images? **Possible Misconceptions:** Lots of colours and different fonts make a good poster Films are filmed all in one shot.	Digital content is designed to get our attention and affect our opinions. long shot	Long shot medium shot close up extreme close up		MM16 - Designing Posters MM17 - Film Shots Google slides Canva for Education

Spring 2 **Data Handling**	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.	To explain that data gathered over time can be used to answer questions To use a digital device to collect data automatically To explain that a data logger collects 'data points' from sensors over time To recognise how a computer can help us analyse data To identify the data needed to answer questions To use data from sensors to answer questions	Children will consider what data can be collected and how it is collected and think about questions that can and can't be answered using available data. Children will learn that sensors can be connected to data loggers, which can automatically collect data while not attached to a computer. Children will record data at set moments in time and draw parallels with the data points that a data logger captures at regular intervals then they will connect the loggers to a computer and download the data. Children will use software to find out key information by analysing a data file Children will choose a question to focus on, and then plan the data logging process that they need to complete Children will use the data collected to answer the question that they selected and reflect on the benefits of using a data logger.	Why could automatic data collection be helpful or useful? **Possible Misconceptions:** Pupils may have misconceptions around reading data loggers	Automatic data collection is always gathered in the same manner, with no human error. Data loggers can collect data independently	Table Input device sensor data logger Analyse		Careers/ STEM visit	NCCE - Data logging Lesson 1 - Answering Questions Lesson 2 - Data collection Lesson 3 - Logging Lesson 4 - Analysing Data Lesson 5 - Data for answers Lesson 6 - Answering My Question data loggers
Oracy opportunities for spring term	Discussion: computers make life easier								

<table>
<tr>
<td>Summer 1

Computer Science</td>
<td>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

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</td>
<td>Design and create programs using selection purposefully</td>
<td>Children will follow algorithms which include errors and will use logical reasoning to detect and correct these.

Children will design and code a maze game using the skills and knowledge they have gained so far.

Children will decompose a maze game, create an algorithm for their game before finally coding the game.

Children will use selection to make a more complex program to demonstrate knowledge.</td>
<td>How do you use abstraction?

What is a computer network?</td>
<td>When you go online the information you access could be created and stored anywhere in the world on other networks.</td>
<td>abstraction</td>
<td></td>
<td></td>
<td><a>CS18 - Programming with Selection

<a>CS18 - Make a Maze

Scratch

<a>Barefoot computing – 2d shape debugging</td>
</tr>
<tr>
<td colspan="4"></td>
<td colspan="3">Possible Misconceptions:
Pupils may have misconceptions around connections in networks</td>
<td colspan="3"></td>
</tr>
<tr>
<td>Summer 2

Media</td>
<td>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.</td>
<td>Purposefully combine a range of digital content to present information to others.

Create and combine audio to make a simple musical composition.</td>
<td>Children will learn what a presentation is and its features.

Children will learn how to insert slides, change background colour and recap on adding text and pictures.

Children will identify how to present something to an audience effectively.

Children will create a new presentation and present it to the class.

Children will learn how music is often recorded using separate tracks.

Children will create their own digital, multi track piece of music.</td>
<td>What is a presentation?

What is a multi-track recording?</td>
<td>Music is often recorded using separate tracks.</td>
<td>Slide
Track
Loop</td>
<td></td>
<td></td>
<td><a>MM18 - Presenting Information

<a>MM19 - Multi track Music

Garage band</td>
</tr>
<tr>
<td colspan="4"></td>
<td colspan="3">Possible Misconceptions:

When presenting, look at the presentation and not the audience.

All slides in a good presentation can be different colours.

Lots of text and pictures make a good slide.</td>
<td colspan="3"></td>
</tr>
<tr>
<td>Oracy opportunities</td>
<td colspan="9"></td>
</tr>
</table>

Year 5

Theme	National Curriculum	Progression in Skills	Disciplinary Knowledge	Substantive knowledge			Drivers & 50 things	British Values & Protective Characteristics	Schemes/Resources/ Texts
				Key Questions	Key Facts	Key Vocab			
Autumn 1 **Computer Science**	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller part Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	Understand and use variables in algorithms and programs.	Children will learn what variables are and write algorithms to show how variables are linked to selection. Children will explore and modify the code in existing programs and make a virtual pet with Micro:Bits. Children will explore and decompose a program that uses variables. Children will create their own program using variables on a subject of their choice.	What do we use variables for?	Variables can change.	Variable		STEM visit in class	CS20 - Variables part 1 CS20 - Make a virtual pet CS20 - Designing with variables Scratch Micro:bits
				Possible Misconceptions: Pupils may have some misconceptions around changing variables					
Autumn 2 **Digital Literacy**	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	To explain that computers can be connected together to form systems To recognise the role of computer systems in our lives To identify how to use a search engine To describe how search engines select results To explain how search results are ranked To recognise why the order of results is important, and to whom	Children will explore how digital systems can work and learn about physical and electronic connections. Children will see how devices and processes are connected, and reflect on how computer systems can help them. Children will explain how to search the web and write and test different instructions. Children will conduct their own searches and break down, in detail, the steps needed to find things on the web and consider why some searches return more results than others. Children will find out about how a webpage's content can influence	What is a system? Why do some searches return more results than others?	Components can work together to perform a task. Searches do not always return the results that someone is looking for; they need to be refined.	Computer System Crawler Bot			NCCE – Systems and searching Lesson 1 - Systems Lesson 2 - Computer Systems and Us Lesson 3 - Searching the Web Lesson 4 - Selecting Search results Lesson 5 - How search results are ranked Lesson 6 - How are searches ranked?
				Possible Misconceptions: Children might confuse the search engine and the address bar Children may type in long complicated sentences or questions into the search engine instead of key words					

			where it is ranked in search results. Children will explore some of the limitations of searching and discuss what cannot be searched.						
Oracy opportunities for Autumn term									
Spring 1 **Media**	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.	Develop an understanding of more complex design criteria and apply them to their digital content Understand how the composition of digital content can evoke emotion and apply this to their own digital content creation Design and create simple 3D models	Children will identify the features of a good radio advert and plan, edit, create their own radio ads. Children will evaluate their own radio ads against an agreed criteria. Children will explore what makes a good persuasive film. Children will plan a storyboard for their persuasive film. Children will make a short persuasive film. Children will learn how to create, move, resize, rotate, group and align 3D shapes using online software.	What makes a good radio advert? How is 3D technology used in the world? **Possible Misconceptions:** Pupils may have misconceptions around what the "media" encompasses	A good radio advert is short to keep people interested with the voice over matching what they are selling – exciting, dramatic or funny. 3D printing is already used in medicine and engineering.	Voiceover 3D printing			MM20 - Creating and evaluating Radio Adverts MM21 - Persuasive Short Films MM22 - 3D design
Spring 2 **Data Handling**	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	To use formulae within a spreadsheet to convert measurements of length and distance. To use the count tool to answer hypotheses about common letters in use. To use a spreadsheet to model a real life problem. To use formulae to calculate area and perimeter of shapes.	Children will create a formula in a spreadsheet to convert measurements. Children will use the 'how many' tool. Children will use a spreadsheet to solve a real-life problem. Children will create simple formulae that use different variables.	How would you add a formula so that the cell shows the product of two other cells? What would you use to have a cell automatically calculate the number of days since a certain date?	Spreadsheets can be used for carrying out investigations.	Rows Columns Formula Formula Bar Totalling tool			Purple Mash – Unit 5.3 Spreadsheets Lesson 1 Lesson 2 Lesson 3 Lesson 4&5 Lesson 6 Chromebooks

		To create formulae that use text variables.	Children will use a spreadsheet to model a real-life situation and come up with solutions that can be practically applied.	**Possible Misconceptions:** Pupils may have misconceptions around using calculations on a spreadsheet				
Oracy opportunities for spring term								
Summer 1 **Computer Science**	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs 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	Understand and use conditional repetition in algorithms and programs Use two-way selection in algorithms and programs Use a broad range of input and output devices in their programs Understand that a computer system comprises input, process, memory and output Understand how search engines work and use them effectively	Children will use conditional repetition to modify and create games. Children will build their own program using conditional repetition. Children will compare different ways of achieving the goal in programming by comparing two way selection and conditional repetition. Children will create programs using inputs and outputs using Micro:Bits. Children will find out what the different parts inside a computer do and explain this in a presentation.	What is a real-life algorithm? What are the different ways computers/digital devices store data?	Variables can be combined with repetition commands to control scores, lives, end of program, number of correct answers, etc.	Initialise Memory **Possible Misconceptions:** Pupils may have misconceptions around the usefulness of algorithms		CS21 - Games using Repeat Until CS22 - Two Way Selection CS23 - Physical Computing with Inputs and Outputs CS24 - Computer Parts and processes Micro:bits
Summer 2 **Media**	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.	Develop an understanding of basic presentation skills and apply them when presenting Understand how a range of online spaces and tools can be used to create digital content collaboratively	Children will identify new features of presenting effectively. Children will plan and create their own presentations. Children will record their presentations and upload them. Children will find out about collaborative, online tools.	What are the basic features of good presentation design?	Films/animations/games are created by several teams often working in different geographical locations.	speaker notes presenter view server real time **Possible Misconceptions:** Pupils may have misconceptions around a comic strip and how these can be most impactful		MM23 - Presenting Persuasively MM24 - Collaborating Collectively

			Children will experiment with a collaborative jigsaw puzzle tool. Children will work in groups to create a comic strip sharing information.				
Oracy opportunities for summer term							

Year 6

Theme	National Curriculum	Progression in Skills	Disciplinary Knowledge	Substantive knowledge			Drivers & 50 things	British Values & Protective Characteristics	Schemes/Resources/ Texts
				Key Questions	Key Facts	Key Vocab			
Autumn 1 **Computer Science**	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 selection, variables, input and output to create a program using a physical device Understand the difference between the internet and the world wide web and how data is transferred across the Internet	Children will learn how to use the Micro:Bit as a light level sensor using selection and variable to display different messages according to the light levels. Children will learn the basics of how the internet works using packet switching creating a physical representation of the Internet and packet switching. Children will choose a resource to share information with others.	What is the difference between the internet and the WWW? What is packet switching? **Possible Misconceptions:** The children think the internet is an actual place where information can be collected from and stored centrally.	Packet switching is a system that breaks the data that is transferred into smaller pieces like a jigsaw puzzle.	Encryption URL			CS28 - Reading Light Levels CS29 - What is the Internet (Part 1) CS29 - The Internet (Part 2)
Autumn 2 **goIT**	Select, use and combine a variety of software (including internet services) on a	Understand the varying roles computer scientists can play in industry.	Identifying jobs that use Computer Science	What are the different steps of design thinking?	People use design thinking to solve everyday problems.	Design thinker Iterative Empathy Stakeholder	50 things: Invent something		goIT STEM planning Teachable Machine

	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. Design, create, evaluate and amend a program to meet a design brief.	Apply understanding of the Design Thinking Model to adjust real-world product life cycles. Communicate basic concepts of Artificial Intelligence and Machine Learning. Work in groups to ideate a technological solution to an identified problem. Communicate how to train and develop their own machine learning tool by classification. Understand and communicate the importance of testing and training data. Understand and apply the concept of storyboarding to design a classification tool. Purposefully design and create their own digital content based on their design knowledge and the needs of an audience.	Understanding the different steps of design thinking Learn the concept of classification through the use of Teachable Machine. Identify ways that the technology could solve the defined problem. Train and apply a prototype to solve real-world problems. Design and deliver a presentation	What could an AI do to make today's jobs easier?	Artificial Intelligence (AI) is the process giving computers the ability to do the same tasks humans can.	ideate			Sustainable Development Goals
				Possible Misconceptions: Children might think that only people who use computers in their job need to use computer science. Children might think AI can make decisions on its own instead of being programmed to teach intelligence which is how it learns.					
Oracy opportunities for Autumn term	Discussion about what are the pro's and cons of AI in today's society. How does AI make life easier today?								

Spring 1 **Digital Literacy**	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	Describe how computers use addresses to access websites Identify and explain the main parts of a data packet Explain that data is transferred over networks in packets Explain that all data transferred over the internet is in packets Send information over the internet in different ways Explain how the internet enables effective collaboration Choose methods of communication to suit particular purposes Explain how to report inappropriate content online.	Children will explore what is necessary for effective communication and the importance of agreed protocols. Children will gain an understanding of the key parts of a packet: the header and the data payload. Children will consider how people can work together when they are not in the same location. Children will be introduced to reusing and modifying work done by someone else. Children will evaluate which methods of communication suit particular purposes. Children will explore issues around privacy, information security and reporting of inappropriate content.	What can be transferred on the internet (other than messages in text)?	When computers send messages, they have the address they're sending to and the one it's coming from. Packets are used because they break large volumes of data into small chunks, making them easier to send across networks. data	Internet Protocol (IP) address Domain Name Server (DNS) Data Packet data payload			NCCE - Computing systems and networks - Communication and collaboration Lesson 1 - Internet adresses Lesson 2 - Data Packets Lesson 3 - Working Together Lesson 4 - Shared Working Lesson 5 - How we Communicate Lesson 6 - Communicating Responsibly
				Possible Misconceptions: Children may think that the data is sent in a single, unbroken stream					
Spring 2 **Data Handling**	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	To know what a spreadsheet looks like. To navigate and enter data into cells. To introduce some basic data formulae for percentages, averages and max and min numbers. To demonstrate how the use of spreadsheets can save time and effort when performing calculations.	Children will navigate and enter data into cells. Children will understand how using formulae allows the data to change and the calculations to update automatically. Children will use a spreadsheet to model a situation. Children will use a variety of methods including flash fill,	How do you carry out a multiplication calculation? How does using the SUM function save time?	A delimiter is a character that separates each piece of data.	Cell Reference Conditional formatting Computational Model Delimiter Text Wrapping			Purple Mash – Unit 6.9 Spreadsheets Lesson 1 Lesson 2 Lesson 3 Lesson 4 Lesson 5 Lesson 6 Lesson 7 Lesson 8

		To use a spreadsheet to model a situation. To demonstrate how a spreadsheet can make complex data clear by manipulating the way it is presented. To create a variety of graphs in sheets. To apply spreadsheet skills to solving problems.	convert text to tables and splitting cells for organising and presenting their data in a spreadsheet. Children will use formulae for percentages, averages, max and min into spreadsheets. Children will create a variety of charts and graphs to understand data. Children will use a spreadsheet to model a real-life situation. Children will apply spreadsheet skills to solving problems.	**Possible Misconceptions:** Children may think that spreadsheets mean 'Excel' but there are many different brands including Google sheets and Apple Numbers Children may think that spreadsheets are only for complicated Maths problems			Chromebooks Google sheets
Oracy opportunities for spring term							
Summer 1 **Computer Science**	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	Design, create, evaluate and amend a program to meet a design brief	Children will define a 'variable' as something that is changeable Children will explain why a variable is used in a program Children will choose how to improve a game by using variables Children will design a project that builds on a given example Children will use their design to create a project Children will evaluate their project	Why is 'Number' not a useful name for a variable? What would happen if the score was never reset in a game? **Possible Misconceptions:** Pupils may have misconceptions around naming of variables	A variable can only hold one value at any one time. Variables can be set and changed while a program is running.	prototype	NCCE - Programming - Variables in a game Lesson 1 - Introducing Variables Lesson 2 - Variables in Programming Lesson 3 - Improving a Game Lesson 4 - Becoming a Games Designer Lesson 5 - Design to Code Lesson 6 - Improving and Sharing

<table>
<tr>
<td>Summer 2

Media</td>
<td>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.</td>
<td>Purposefully design and create their own digital content based on their design knowledge and the needs of an audience.</td>
<td>Children will recap on all the media used over the years.

Children will consider, plan and practise embedding content.

Children will plan each page of their information book.

Children will add all the pages, text and images into Book Creator.

Children will add content to their books.

Children will evaluate their books against an agreed criteria.</td>
<td>How do you embed content into a digital book?</td>
<td>It is possible to combine several pieces of media into one.</td>
<td></td>
<td></td>
<td></td>
<td>MM28 - Bringing it altogether

Google slides</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td colspan="3">Possible Misconceptions:
Pupils may have misconceptions around the content of a digital book and the presentation on screen compared to a printed version</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oracy opportunities for summer term</td>
<td colspan="9"></td>
</tr>
</table>