Churchside Federation

Progression Document for Computing – September 2024

Progression of KPIs in the National Curriculum

KPIs	CS (Computer Science)	IT (Information Technology)	DL (Digital Literacy)
Year 1	• Understand what algorithms are • Create simple programs	• Use technology purposefully to create digital content • Use technology purposefully to store digital content • Use technology purposefully to retrieve digital content	• Use technology safely • Keep personal information private
Year 2	• Understand that algorithms are implemented as programs on digital devices • Understand that programs execute by following precise and unambiguous instructions • Use logical reasoning to predict the behaviour of simple programs • Debug simple programs	• Use technology purposefully to organise digital content • Use technology purposefully to manipulate digital content	• Recognise common uses of information technology beyond school • Use technology respectfully • Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.
Year 3	• Write programs that accomplish specific goals • Use sequence in programs • Work with various forms of input • Work with various forms of output	• Use a variety of software to accomplish given goals • Collect information • Design and create content • Present information	• Use technology responsibly • Identify a range of ways to report concerns about contact
Year 4	• Design programs that accomplish specific goals • Debug programs that accomplish specific goals • Use repetition in programs • Use logical reasoning to detect and correct errors in programs • Understand how computer networks can provide multiple services, such as the world wide web	• Select a variety of software to accomplish given goals • Select, use and combine internet services • Collect data • Present data	• Understand the opportunities that computer networks offer for communication • Identify a range of ways to report concerns about content • Recognise acceptable / unacceptable behaviour
Year 5	• Solve problems by decomposing them into smaller parts • Use selection in programs • Control or simulate physical systems • Use logical reasoning to explain how some simple algorithms work • Appreciate how search results are ranked	• Combine a variety of software to accomplish given goals • Select, use and combine software on a range of digital devices • Use search technologies effectively • Analyse information • Evaluate information	• Be discerning in evaluating digital content
Year 6	• Understand computer networks including the internet • Use logical reasoning and correct errors in algorithms • Work with variables	• Design and create systems • Analyse data • Evaluate data	• Understand the opportunities computer networks offer for collaboration

Progression aligned with the Teach Computing Curriculum – September 2024

Computer Science

KS1:

♣ 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

KS2:

♣ 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

Year	Teach Computing Units	Sticky Knowledge	Key Skills - Implementation (I will be able to)	Vocabulary
EYFS		Know what an instruction is.	Give instructions to others to complete a task.	Instruction, algorithm
1	Unit 3 - Programming A – Moving a Robot	Task: Plan and execute a program onto a floor robot • Explain what a given command does • Predict the outcome of a sequence involving up to four commands • Match a command to an outcome • Understand that a program is a set of commands that a computer can run • Know that a series of instructions can be issued before they are enacted	• Predict the outcome of a command on a device • Run a command on a floor robot • Choose a command for a given purpose • Choose a series of words that can be enacted as a program • Build a sequence of commands in steps from a given starting point • Combine commands in a program • Run a program on a device • Debug a program to correct errors	Bee-Bot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program.
1	Unit 6 - Programming B – Programming Animations	Task: • Plan a project involving more than one sprite • Explain what a sprite is • Compare different programming blocks • Know a series of commands can be joined together to form a program • Understand that a program is a set of commands a computer can run	• Predict the outcome of a command • List commands that can be used on a device • Match a command to an outcome • Recognise how to run a command • Run different commands for different sprites • Choose a command for a given purpose • Build a sequence of commands in steps • Use the start command to initialise a program • Debug a program	ScratchJr, command, sprite, compare, programming, area, block, joining, start, run, program, background, delete, reset, algorithm, predict, effect, change, value, instructions, design.

2	Unit 3 - Programming A - Robot algorithms	**Task: Plan and execute a program onto a floor robot to reach a given point** • Understand a series of instructions • Understand different algorithms by changing the sequence of commands • Predict what a sequence of commands will do	• Follow sequences of instructions including moving forwards and backwards, and turning left and right. • Plan a series of instructions for someone else to follow • Plan a mat layout with several possible routes • Plan and execute a program to reach a goal and debug as needed	instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, artwork, design, route, mat, debugging, decomposition
2	Programming B - Programming quizzes <u>Computing NC Links (additional to Computer science)</u> • Use technology purposefully to create, organise, store, manipulate and retrieve digital content	• Task: Plan a project including changing backgrounds • Know that a sequence can be started using a variety of event blocks • Know that a sequence has an outcome, and identify different programs that have the same outcome • Know the backgrounds can be changed through the programming blocks • Understand the role of the numbers on ScratchJr blocks	• Write and run a simple program with a start block, and an end block which changes the background • Adapt a given design to create a program with multiple sprites and backgrounds which uses the blocks given in the example • Create and program a quiz with at least two backgrounds which switch based on an action • Identify errors in their program, and debug them	sequence, command, program, run, start, outcome, predict, blocks, design, actions, sprite, project, modify, change, algorithm, build, match, compare, debug, features, evaluate, decomposition, code.
3	Unit 3: Programming A – Sequencing Sounds	• Explain what sequence means and demonstrate it in an algorithm • To explain that programs start because of an input • Explain what a sequence is • Identify that a program includes sequences of commands • Identify that the sequence of a program is a process • Explain that the order of commands can affect a program's output • Identify that different sequences can achieve the same output • Identify that different sequences can achieve different outputs	• Choose a name that describes the action of the sprite • Choose relevant backdrops and costumes • Create an algorithm for each sprite • build a sequence of commands • Combine commands in a progam • Order commands in a program • create a sequence of commands to produce a given outcome • Adapt their code for additional named sprites • Explain why the code is in that particular sequence • Run code and identify if it meets the requirements of the task	Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task, design, run the code, order, note, chord, algorithm, bug, debug, code.
3	Unit 6: Programming B – Events and Actions in programs	• Explain that programs start because of an input • Explain what a sequence is • Identify that a program includes sequences of commands	• Build a sequence of commands • Combine commands in a program • Order commands in a program	motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen,

		• Identify that the sequence of a program is a process • Explain that the order of commands can affect a program's output • Identify that different sequences can achieve the same output • Identify that different sequences can achieve different outputs	• Create a sequence of commands to produce a given outcome	design, action, debugging, errors, setup, code, test, debug, actions.
4	Unit 3: Programming A – Repetition in shapes	• Understand what 'repeat' means • Explain that we can use a loop command in a program to repeat instructions • Identify patterns in a sequence • Identify a loop within a program • Explain that in programming there are indefinite loops and count-controlled loops • Explain that an indefinite loop will run until the program is stopped • Explain that you can program a loop to stop after a specific number of times • Identify patterns in a sequence, eg 'step 3 times' means the same as 'step, step, step' • Justify when to use a loop and when not to • Explain the importance of instruction order in a loop • Recognise that not all tools enable more than one process to be run at once	• List an everyday task as a set of instructions including repetition • Use an indefinite loop to produce a given outcome • Use a count-controlled loop to produce a given outcome • Plan a program that includes appropriate loops to produce a given outcome • Recognise tools that enable more than one process to be run at the same time (concurrency) • Create two or more sequences that run at the same time	Logo (programming environment), program, turtle, commands, code snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled loop, value, trace, decompose, procedure.
4	Unit 6: Programming B – Repetition in games	• Understand what 'repeat' means • Explain that we can use a loop command in a program to repeat instructions • Identify patterns in a sequence • Identify a loop within a program • Explain that in programming there are indefinite loops and count-controlled loops	• List an everyday task as a set of instructions including repetition • Use an indefinite loop to produce a given outcome • Use a count-controlled loop to produce a given outcome	Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify,

		• Explain that an indefinite loop will run until the program is stopped • Explain that you can program a loop to stop after a specific number of times • Identify patterns in a sequence, eg 'step 3 times' means the same as 'step, step, step' • Justify when to use a loop and when not to • Explain the importance of instruction order in a loop • Recognise that not all tools enable more than one process to be run at once	• Plan a program that includes appropriate loops to produce a given outcome • Recognise tools that enable more than one process to be run at the same time (concurrency) • Create two or more sequences that run at the same time	design, algorithm, debug, refine, evaluate.
5	Unit 3: Programming A – Selection in physical computing	• Explain that a condition can only be true or false • Relate that a count-controlled loop contains a condition • Compare a count-controlled loop with a condition-controlled loop • Explain that a condition-controlled loop will stop when a condition is met • Explain that when a condition is met, a loop will complete a cycle before it stops • Explain that selection can be used to branch the flow of a program • Explain that a loop can be used to Repeatedly check whether a condition has been met • Explain the importance of instruction order in 'if...then...else...' statements	• Create a condition-controlled loop • Use a condition in an 'if...then…' statement to start an action • Use selection to switch the program flow in one of two ways • Use a condition in an 'if...then...else…' statement to produce given outcomes	microcontroller, USB, components, connection, infinite loop, output component, motor, repetition, count-controlled loop, Crumble controller, switch, LED, Sparkle, crocodile clips, connect, battery box, program, condition, Input, output, selection, action, debug, circuit, power, cell, buzzer
5	Unit 6: Programming B – Selection in quizzes	• Explain that a condition can only be true or false • Relate that a count-controlled loop contains a condition • Compare a count controlled loop with a condition-controlled loop	• Choose a condition to use in a program • Create a condition-controlled loop • Use a condition in an 'if... then…' statement to start an action • Use selection to switch program flow	Selection, condition, true, false, count-controlled loop, outcomes, conditional statement, algorithm, program, debug, question, answer, task, design, input,

		• Explain that a condition-controlled loop will stop when a condition is met • Explain that when a condition is met a loop will complete a cycle before it stops • Explain that selection can be used to branch the flow of a program • Explain that a loop can be used to repeatedly check whether a condition has been met • Explain the importance of instruction order in 'if... then... else...' statements	• Use 'if... then... else…' to switch program flow in one of two ways	implement, test, run, setup, operator
6	Unit 3: Programming A – Variables in games	• Define a 'variable' as something that is changeable • Identify examples of information that is variable, for example, a football score during a match • Explain that a variable can be used in a program, eg 'score' • Define a program variable as a placeholder in memory for a single value • Explain that a variable has a name and a value • Recognise that the value of a variable can be used by a program • Recognise that the value of a variable can be updated • Identify that variables can hold numbers (integers) or letters (strings) • Define the way that a variable is changed • Recognise that a variable can be set as a constant (fixed value) • Explain the importance of setting up a variable at the start of a program (initialisation) • Explain that there is only one value for a variable at any one time	• Identify a variable in an existing program • Experiment with the value of an existing variable • Choose a name that identifies the role of a variable to make it easier for humans to understand it • Decide where in a program to set a variable • Update a variable with a user input • Use an event in a program to update a variable • Use a variable in a conditional statement to control the flow of a program • Use the same variable in more than one location in a program	variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share, assign, declare

		• Explain that if you change the value of a variable, you cannot access the previous value (cannot undo) • Explain that if you read a variable, the value remains • Explain that the name of a variable is meaningless to the computer • Explain that the name of a variable needs to be unique		
6	Unit 6: Programming B – Sensing movement	• Define 'variable' as something that is changeable • Identify examples of information that is variable, e.g. a football score during a match • Explain that a variable can be used in a program, e.g. 'score' • Define a program variable as a placeholder in memory for a single value • Explain that a variable has a name and a value • Recognise that the value of a variable can be used by a program • Recognise that the value of a variable can be updated • Recognise that a variable can be set as a constant (fixed value) • Explain the importance of setting up a variable at the start of a program (initialisation) • Explain that there is only one value for a variable at any one time • Explain that if you change the value of a variable, you cannot access the previous value (cannot undo) • Explain that if you read a variable, the value remains	• Identify a variable in an existing program • Choose a name that identifies the role of a variable to make it more usable (to humans) • Decide where in a program to set a variable • Update a variable with a user input • Use an event in a program to update a variable • Use a variable in a conditional statement to control the flow of a program • Use the same variable in more than one location in a program	Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, sensing, accelerometer, value, compass, direction, navigation, design, task, algorithm, step counter, plan, create, code, test, debug.

		• Explain that the name of a variable is meaningless to the computer • Explain that the name of a variable needs to be unique		

Information Technology

KS1:

♣ 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.

KS2:

♣ 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

Year	NC Objectives	Sticky Knowledge	Key Skills	Vocabulary
EYFS		• Know the names of some types of technology in their world. • Know that technology can be used for playing games, learning and watching videos.	• Click buttons/tap an iPad to open content. (Open photos • I can play on a touch screen game and use computers/keyboards/mouse in role play • I can type letters with increasing confidence using a keyboard and tablet. • I can dictate short, clear sentences into a digital device.	On, Off, tap, type, mouse, keyboard, computer
1	Unit 1 - Computing systems and networks – Technology around us <u>Computing NC Links (in addition to above)</u> • 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 <u>Education for a connected World</u> • Health, well-being and lifestyle • Self Image and identity	• Identify examples of technology and explain how they can help us • Recognise that a computer is an example of technology • Describe what a keyboard is for • Know a computer stores work in files • Give examples of rules to keep them safe and healthy when they are using technology in and beyond the home	• Choose a piece of technology to do a job • Identify the main parts of a computer • Use a keyboard to type their name on a computer • Turn on the computer and log on with an aid • Use a mouse in different ways – click, select and drag • Use the keyboard to edit text and delete letters • Demonstrate that they can use technology safely	technology, computer, mouse, trackpad, keyboard, screen, double-click, typing.

	• Managing Online Information • Copywrite and Ownership			
1	**Unit 4 - Data and Information – Grouping Data** <u>Computing NC Links</u> • 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.	• Know that a data set can be a group or collection of objects with related properties. • Know that objects can be sorted and grouped in different ways according to their properties.	• Identify, describe and label groups of objects. Count, sort and compare groups of objects. • Analyse data by counting.	object, label, group, search, image, property, colour, size, shape, value, data set, more, less, most, fewest, least, the same

2	**Unit 1 - Computing systems and networks - Information technology around us**
	
	<u>Computing NC Links</u>
	• 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.
	
	<u>Education for a connected World</u>
	• Health, well-being and lifestyle
		• Recognise the uses and features of information technology.
		• Know that IT can be explained as being a computer or something that has been made to work with computers (laptop, PC, tablet, scanner, barcode scanner, printer, smart speaker)
		• Describe some uses of computers
		• Identify the uses of information technology in the school and beyond school
		• Know how IT can work together:
		  ○ Barcode scanner, till
		  ○ Traffic light, crossing button, crossing signal
		• Explain how information technology helps us
		• Explain how to use information technology safely and how rules can help keep me safe
		• Recognise that choices are made when using information technology.
			• Use IT for different types of activities
			• Explain the need to use IT in different ways
				Information technology (IT), computer, barcode, scanner/scan, laptop, PC, printer.

2	**Data and information – Pictograms** <u>Computing NC Links</u> • use technology purposefully to create, organise, store, manipulate and retrieve digital content • use technology safely and respectfully,	• Understand that tally charts collect data • Know that objects that have been grouped by attribute can be compared. • Suggest appropriate headings for tally charts and pictograms	• Enter data on a computer • Use a computer to view data in different formats • Use pictograms to answer single-attribute question	more than, less than, most, least, common, popular, organise, data, object, tally chart, votes, total, pictogram, enter, data, compare, objects, count, explain, attribute, group,

	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	• Know that information can be presented using a computer • Use a computer program to present information in different ways • Give simple examples of why some information should not be shared	• Use a computer to answer comparison questions (graphs, tables) • Recognise that people, animals and objects can be described by attributes	same, different, conclusion, block diagram, sharing
3	**Unit 1: Computing Systems and Networks – Connecting Computers** <u>Computing NC Links</u> • 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 <u>Education for a Connected World links</u> • Privacy and Security - I can describe simple strategies for creating and keeping passwords private.	• Describe what an input is • Explain that a process actions on inputs • Explain that an output is produced by the process and the process can affect the output • Recognise that a digital device is made up of several parts • Recognise that computers can be connected to each other • Identify how devices in a network are connected with one another • Recognise that a network us made up of a number of components • Explain how information is passed through multiple connections • Explain how computer systems can change the way that we work	• Identify input and output devices • Explain that a computer system accepts an input and processes it to produce an output. • Explain how a computer network can be used to share information • Explain the role of a switch, server and wireless access point in a network • Identify network devices around me • Explain how networks can be connected to other networks.	digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets
3	**Unit 4: Data and information – Branching databases** <u>Computing NC Links</u>	Know what an attribute is • identify attributes that you can ask yes/no questions about	• Investigate and create questions with yes/no answers • choose questions that will divide objects into evenly sized subgroups	attribute, value, questions, table, objects, branching, database, objects, equal, even, separate, structure,

	• 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	• select an attribute to separate objects into two similarly sized groups • explain that a branching database is an identification tool • recognise that a data set can be structured using yes/no questions • explain that a well-structured branching database will enable you to identify objects using fewer questions • relate two levels of a branching database using AND • suggest real-world applications for branching databases	• repeatedly create subgroups of objects • identify an object using a branching database • retrieve information from different levels of the branching database	compare, order, organise, selecting, information, decision tree.

4	Unit 1: Computing systems and networks – The Internet
	
	<u>Computing NC Links</u>
	• 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;
		• Describe how networks connect to other networks
		• Outline how information can be shared via the World Wide Web
		  ○ describe how to access the World Wide Web
		  ○ describe the types of content/media that can be added, created, and shared on the World Wide Web
		  ○ explain how the content of the World Wide Web is created, owned, and shared by people
		• Recognise that the World Wide Web is part of the internet
		  ○ explain that the internet enables us to view the World Wide Web
			•	internet, network, router, security, switch, server, wireless access point (WAP), website, web page, web address, routing, web browser, World Wide Web, content, links, files, use, download, sharing, ownership, permission, information, accurate, honest, content, adverts

	identify a range of ways to report concerns about content and contact. Education for a Connected World links • 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. •	○ o explain that the World Wide Web comprises of websites and web pages • Explain that the global interconnection of networks is the internet • Recognise the need for security on the internet • Describe current limitations of the WWW media • Evaluate reliability of content and consequences of unreliable content • Explain the benefits of the WWW		
4	**Unit 4: Data and information – Data logging** Computing NC Links • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • 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	• Suggest questions that can be answered using a table of data • Identify data that can be logged over time • Identify that sensors are input devices • Recognise that a sensor can be used as an input device for data collection • Explain that a data logger captures 'data points' from sensors over time	• Use a digital device to collect data automatically • Choose an appropriate timeframe when collecting data automatically • Use a set of logged data to find information • Use a computer program to sort data by one attribute • Export information in different formats	data, table, layout, input device, sensor, logger, logging, data point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.
5	**Unit 1: Computing systems and networks – systems and searching** Computing NC Links • Understand computer networks, including the internet; how they can	• Recognise that a system is a set of interconnected parts which work together	• Describe the input and output of a search engine • Demonstrate that different search terms produce different results	system, connection, digital, input, process, storage, output, search, search engine, refine, index, bot, ordering, links,

	provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration **Education for a Connected World links** Managing Online Information • I can explain the benefits and limitations of using different types of search technologies e.g. voice-activation search engine. I can explain how some technology can limit the information I am presented with. Privacy and Security • I can explain what a strong password is and demonstrate how to create one	• Explain that computers can be connected together to form IT systems • Identify that data can be transferred between IT systems • Recognise inputs, processes, and outputs in large IT systems • Describe the role of a particular IT system in their lives • Relate that search engines are examples of large IT systems • Explain why search engines create indices, and that they are different for each search engine • Explain the role of web crawlers in creating an index • Explain how search results are selected • Explain that ranking orders search results to make them more useful • Explain how ranking is determined by rules, and that different search engines use different rules • Explain why the order of results is important and to whom • Explain how search engines make money by selling targeted advertising space • Identify some of the limitations of search engine	• Evaluate the results of search termsc	algorithm, search engine optimisation (SEO), web crawler, content creator, selection, ranking.
5	Unit 4: Data and information – Flat file databases Computing NC Links • Use search technologies effectively, appreciate how results are selected and	• Explain that a computer program can be used to organise data • Explain that tools can be used to select data to answer questions	• Choose different ways to view data • Choose which attribute and value to search by to answer a given question (operands)	database, data, information, record, field, sort, order, group, search, value, criteria, graph, chart, axis, compare, filter, presentation.

	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	• Outline how ordering data allows us to answer some questions • Outline how operands can be used to filter data • Outline how 'AND' and 'OR' can be used to refine data selection • Explain that computer programs can be used to compare data visually • explain that we present information to communicate a message	• Ask questions that need more than one attribute to answer • Choose which attribute to sort data by to answer a given question • Choose multiple criteria to search data to answer a given question (AND and OR) • Select an appropriate graph to visually compare data • Choose suitable ways to present information to other people	
6	Unit 1: Computing systems and networks – Communication and collaboration <u>Computing NC links</u> • 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 <u>Education for a Connected World links</u>	• Recognise that data is transferred across networks using agreed protocols (methods) • Recognise that connections between computers allow access to shared stored files • Explain that data is transferred in packets • Recognise computers connected to the internet allow people in different places to work together • Discuss the opportunities that technology offers for communication and collaboration • Explain which types of media can be shared through the internet • Explain that communicating and collaboration using the internet can be public or private	• Outline methods of communicating and collaborating using the internet • Choose methods of internet communication and collaboration for given purposes • Evaluate different methods of online communication and collaboration • Decide what you should and should not share online	communication, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, oneway, two-way, one-to-one, one-to-many.

	• I can describe and assess the benefits and the potential risks of sharing information online. • 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			
6	**Unit 4: Data and information – Introduction to spreadsheets** <u>Computing NC links</u> • 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>Education for a Connected World links</u> **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 • I can evaluate digital content and can explain how I make choices from search results	• Identify questions that can be answered using spreadsheet data • Explain what an item of data is in a spreadsheet • Outline that there are different software tools to work with data • Explain how the data type determines how a spreadsheet can process the data • Explain that formulas can be used to produce calculated data • Recognise cells can be linked • explain why data should be organised in a spreadsheet • Recognise that a cell's value automatically updates when the value in a linked cell is changed • Evaluate results in comparison to the question asked	• Calculate data using a formula for each operation • Use functions to create new data • Use existing cells within a formula • Choose suitable ways to present spreadsheet data	data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, spreadsheet, input, output, operation, range, duplicate, sigma, propose, question, data set, organised, chart, evaluate, results, sum, comparison, software, tools.

Digital Literacy

KS1:

♣ 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.

KS2:

♣ use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

♣ Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

Year	NC Objectives	Sticky Knowledge	Key Skills	Vocabulary
EYFS		• Know that they can say no if someone asks me to do something that makes me sad, embarrassed, worried or upset.	• Know when something is making me sad/embarrassed/worried • Know who to talk to if I am worried	Sad, embarrassed, worried, upset, no, stop
1	Unit 2 - Creating with Media – Digital Painting Computing NC Links Use technology purposefully to create, organise, store, manipulate, and retrieve digital content Cross curricular link – Art	• Explain what different freehand tools do • Recognise that computers can be used to create a range of art • Recognise a tool can be adjusted	• Choose appropriate paint tools to recreate a picture • Use freehand tools, changing the colour and brush size • Use shape and line tools for precision, changing the size, shape and colour • Use the undo button to correct mistakes • Use the fill tool to colour an enclosed area	paint program, tool, paintbrush, erase, fill, undo, shape tools, line tool, fill tool, undo tool, colour, brush style, brush size, pictures, painting, computers
1	Unit 5 - Creating Media – Digital Writing Computing NC Links • 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.	• Know that a keyboard is used to enter text into a computer • Know that the appearance of text can be changed	• Recognise some keys and use them to enter text on to a computer/device including some basic punctuation • Add spaces between most words using a space bar • Use the backspace key to delete text only as far as the section to be edited • Use the toolbar to find and use the bold, italic, and underline tool	word processor, keyboard, keys, letters, type, numbers, space, backspace, text cursor, capital letters, toolbar, bold, italic, underline, mouse, select, font, undo, redo, format, compare, typing, writing.
2	Unit 2 - Creating media - Digital Photography	• Explain some aspects of taking a good photograph	• Take a photograph using a simple camera or device that has been set up in camera mode	device, camera, photograph, capture, image, digital,

	Computing NC Links • 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	• Know that a photo can be portrait or landscape	• Identify some of the reasons why a photograph may be good or bad • Experiment when taking photos with different light sources • Identify a photo that has been enhanced using tools when asked questions • use different tools to change how a photograph looks	landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, framing, lighting,
2	**Creating media - Digital Music** Computing NC Links • 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 Music NC 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 interrelated dimensions of music	**Task: Plan and create a piece of music** • Reflect on a piece of music • Follow a rhythm pattern • Understand that a computer can generate different sounds • Understand that a computer can be used to make a sequence of notes • Understand how pattern and rhythm can be used to depict an animal	• Create and follow a rhythm pattern using two different instruments • Use the computer to generate different sounds represented by images • Create a sequence of notes on the computer and start to refine them • Create a sequence of notes that use rhythm and tempo to link with a chosen animal, refining their work	music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat, instrument, open, edit.
3	**Unit 2: Creating Media – Stop-frame animation** Computing NC Links • select, use and combine a variety of software (including internet services) on a range of digital devices to design and	• Explain that animation is a sequence of drawings or photographs • Relate animated movement with a sequence of images	• Plan an animation • Use onion skinning to help make small changes between frames • Review a sequence of frames to check my work • Evaluate the quality of an animation and improve it	animation, flip book, stopframe, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency,

	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		• Evaluate the impact of adding other media to an animation	evaluation, delete, media, import, transition.
3	Unit 5: Creating Media – desktop publishing Computing NC Links • 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 **Education for a Connected World links** **Managing online information** • I can demonstrate how to use key phrases in search engines to gather accurate information online.	• Describe how different challenges require different solutions • Give an example of when using text, images or emojis online could be misinterpreted. • Recognise how text and images can be used together to convey information • Consider how different layouts can suit different purposes • Recognise that DTP pages can be structured with placeholders	• Choose an appropriate layout for a given scenario • Use placeholders appropriately to divide the page (magazine) • Add text and images • Move, resize and rotate images • Format some of the text – choose fonts and apply effects to text.	text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits.

	• I can describe and demonstrate how we can get help from a trusted adult if we see content that makes us feel sad, uncomfortable, worried or frightened			
4	Unit 2: Creating media – Audio production <u>Computing NC Links</u> • 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 <u>Education for a Connected World links</u> 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 give some simple examples of content which I must not use without permission from the owner, e.g. videos, music, images.	• Explain the key information that the podcast will include • Identify the types of sound that will be included • Know that sound can be recorded • Identify that an input device is needed to record sound • Identify that output devices are needed to play audio • Recognise that recorded audio can be stored on a computer • Recognise that audio can be edited • Recognise that sound can be represented visually as a waveform • Recognise that audio can be layered so that multiple sounds can be played at the same time. • Consider the results of editing choices made	• Record sound using a computer • Play recorded audio • Import appropriate audio into a project. • Change the volume of tracks in a project. • Use editing tools to remove some unneeded sounds or pauses •	audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback.

4	Unit 5: Creating media – Photo editing Computing NC Links • 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 **Education for a Connected World links** Self-image and identity • I can explain how my online identity can be different to my offline identity	• Recognise that digital images can be manipulated • Recognise that digital images can be changed for different purposes	• Use an application to change the whole of a digital image – adjust colours, apply filters, effects, change composition of the digital image including cropping, rotating and flipping. • use an application to change part of a digital image – clone, copy, paste to change the composition of a digital image • use an application to add to the composition of a digital image – text. • Select images and combine them into one • Use a range of tools to create their image • Add relevant text to their publication •	image, edit, digital, crop, rotate, undo, save, adjustments, effects, colours, hue, saturation, sepia, vignette, image, retouch, clone, select, combine, made up, real, composite, cut, copy, paste, alter, background, foreground, zoom, undo, font.
5	Unit 2: Creating media – Video production Computing NC Links • 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;	• Explain the features of video as a visual media format • Recognise which devices can and can't record video • Explain the purpose of a storyboard • Recognise that filming techniques can be used to create different effects • Recognise the need to regularly review and reflect on a video project • Explain the limitations of editing video on a recording device • Identify that videos can be edited on a recording device or on a computer	• Identify features of a video recording device or application • Use different camera angles • Use pan, tilt and zoom • Combine filming techniques for a given purpose • Decide what changes I will make when editing • Choose to reshoot a scene or improve later through editing • Use split, trim and crop to edit a video	video, audio, camera, talking head, panning, close up, video camera, microphone, lens, mid-range, long shot, moving subject, side by side, angle (high, low, normal), static, zoom, pan, tilt, storyboard, filming, review, import, split, trim, clip, edit, reshoot, delete, reorder, export, evaluate, share.

	identify a range of ways to report concerns about content and contact **Education for a Connected World links** Online relationships • I can explain how someone can get help if they are having problems and identify when to tell a trusted adult.	• Identify videos can be improved through and reshooting or editing • Recognise projects need to be exported to be shared		
5	Unit 5: Creating media – Introduction to vector graphics Computing NC Links • 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.	• Identify that a vector drawing comprises separate objects • Recognise that each object in a drawing is in its own layer • Recognise that vector images can be scaled without impact on quality • Recognise that objects can be modified in groups • Explain how alignment and size guides can help create a more consistent drawing	• Add and remove objects to create a drawing of a chosen artefact • Use copy and paste to maintain consistency within the drawing • Manipulate an object's size, colour, and proportion to represent a chosen artefact • Purposefully position and rotate objects • Move objects to different layers to create a specific aspect of a drawing • Manipulate multiple objects concurrently • Group objects to make them easier to work with	vector, drawing tools, object, toolbar, vector drawing, move, resize, colour, rotate, duplicate/copy, zoom, select, align, modify, layers, order, copy, paste, group, ungroup, reuse, reflection
6	Unit 2: Creating media – Web page creation Computing NC links • 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,	• Recognise the relationship between HTML and visual display • Recognise that web pages can contain different media types • Recognise that web pages are written by people • Recognise that a website is a set of hyperlinked web pages • Recognise components of a web page layout	• Review an existing website (navigation bars, header) • Create a new blank web page • Add subpages • Add internal and external hyperlinks • Suggest some improvements • Design considers how the page will look on different devices • Embed media in a web page	website, web page, browser, media, Hypertext Markup Language (HTML), logo, layout, header, media, purpose, copyright, fair use, home page, preview, evaluate, device, Google Sites, breadcrumb trail, navigation, hyperlink, subpage, evaluate, implication, external link, embed.

	including collecting, analysing, evaluating, and presenting data and information. • use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour. Online relationships • I can use the internet with adult support to communicate with people I know. (EY-7) Managing information online • I can navigate online content, websites, or social media feeds using more sophisticated tools to get to the information I want (e.g. menus, sitemaps, breadcrumb-trails, site search functions). (11-14) 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 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. • I can demonstrate the use of search tools to find and access online content which can be reused by others.	• Recognise the need to preview pages (different screens / devices) • Recognise the need for a navigation path • recognise the implications of linking to content owned by others		

	• I can demonstrate how to make references to and acknowledge sources I have used from the internet.			
6	Unit 5: Creating media – 3D Modelling Computing NC links • 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 Education for a Connected World links Privacy and Security • I can describe strategies for keeping my personal information private, depending on context	• Explain that 3D models can be created on a computer • Recognise that a 3D environment can be viewed from different perspectives • Recognise that digital tools can be used to manipulate 3D objects • Show how placeholders can create holes in 3D objects • Recognise that artefacts can be broken down into a collection of 3D objects	• Position 3D shapes relative to one another • Use digital tools to modify 3D objects • Combine objects to create a 3D digital artefact • Use digital tools to accurately size 3D objects • Construct a 3D model which reflects a real world object	TinkerCAD, 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, cube, cuboid, sphere, cone, prism, pyramid, placeholder, hollow, choose, combine, construct, evaluate, modify.