Curzon Computing Curriculum

Our Intent

Curzon specific aims of Computing

Our aim at Curzon is to foster a love of learning where pupils' curiosity is encouraged allowing them to explore and discover the technological and digital world around them, in turn, helping them to grow, flourish and succeed as they move onto their next stage of education and life experiences. We believe that computational thinking is important in helping pupils to solve problems and design systems. Being able to do so makes our pupils better able to conceptualise, understand and use computer-based technology, and so are better prepared for today's world and future.

Computing has become a part of the way we all work; almost everything we do at school now involves the use of computing from delivering lessons via the interactive whiteboard as adults through to pupils using Chromebooks and iPads to conduct own research and complete tasks. We aim for the pupils to be digitally literate so they can find, explore, analyse, exchange and present information. It is our intent that Curzon pupils become responsible users of technology and can use the internet respectfully and safely; this is a major part of enabling the pupils to be confident, creative and independent learners. We aim for all pupils, including those who are disadvantaged, to develop the skills, knowledge and tools to succeed in a digital future.

We have high ambitions for all pupils. Our ethos is to enable all pupils to reach their potential. We do not place a ceiling on attainment. Through carefully designing our computing curriculum to include a range of different activities (e.g, paired work, range of programs), we ensure that all pupils, including SEND, can participate fully. We use technology to enable all our pupils to access all areas of the curriculum, e.g. use of chromebooks to record writing for those who struggle with motor skills. Our curriculum is designed to ensure that higher attainers are challenged through increased opportunities to manipulate software and time for extended computational thinking.

Our vision is that everyone grows like the mustard seed to become the best they can be in an ever-evolving digital world and respect others both on and offline. Everyone has the chance to experience the same opportunities no matter their background and can become advocates for the future of technology. This vision is embedded across the curriculum and underpins Curzon's ethos.

How this links with our school vision: growing in wisdom and respect to become an online role model, using technology in a safe and positive way to take care of one another, in a digital society.

Whilst following the National Curriculum, we have chosen topics according to the following criteria and made our computing curriculum unique to Curzon:

Emphasis on e-safety

We are mindful of the national context of increasing cases of online bullying and abuse and pupils accessing inappropriate material at home. We aim for our pupils to use technology safely and respectfully, knowing what to do if there is an issue and how to get help. We want them to be able to make informed choices based on what they know is right and wrong. Each year, term starts with a reminder of e-safety and we make it explicit that the rules of e safety apply at home as much as at school. Year 6 end the year with a lesson on e safety to prepare them for secondary school. We carry out annual pupil and staff e-safety surveys.

A challenging computing curriculum

We are aware that technology is changing all the time. Our pupils are growing up in an increasingly digital world and have more knowledge of technology than they did 10 years ago. We have chosen Teach Computing as the content is frequenty updated and it provides challenging tasks, such as programming a micro bit.

Developing cross curricular links

Where appropriate, we have drawn on our humanities and science topics when teaching specific areas of knowledge and skill. This creates a relevant context for computing lessons and consolidates the learning in both computing and other subjects. For example, Year 3 branching databases linking with animal classification in science and Year 5 ad 6 creating spreadsheets and charts linking with statistics in maths.

Computing across the curriculum

We intend for technology to enhance learning in all subjects and plan for its use across the curriculum e.g. graphs in science, creating presentations in humanities.

Developing resilience

One of our key aims in computing, as in other subjects, is to develop pupils' resilience. We teach Curzon pupils to try something out and to solve the problems themselves within the safe enrivonment of a game or program. Teach Computing was chosen as there is a real emphasis on debugging and trial and error. This links with our value of courage.

Computing systems and networks	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Concepts	-To explain that technology is something that can help us -To identify examples of technology -To explain how examples of technology help us -To recognise that a computer is an example of technology -To recognise that choices are made when using technology -To explain why rules are needed when using technology	- To recognise different types of computers used in school - To identify that a computer is a part of information technology - To recognise the features of information technology - To say how rules for using information technology can help us - To talk about uses of information technology - To say how rules for using information technology can help us	-To describe what an input is -To explain that a process acts on the inputs -To explain that an output is produced by the process -To identify how changing the process can affect the output -To recognise that a device is made up of several parts -To recognise and identify how computers can be connected to each other -To recognise that a network is made up of a number of components.	-To describe how networks connect to other networks -To outline how information can be shared via the World Wide Web -To recognise that the World Wide Web is part of the internet -To explain that the global interconnection of networks is the internet -To recognise the need for security on the internet -To describe the types of content/media that can be added, created, and shared	-To recognise that a system is a set of interconnected parts which work together -To explain that computers can be connected together to form IT systems -To identify that data can be transferred between IT systems -To recognise inputs, processes, and outputs in large IT systems -To describe the role of a particular IT system in their lives -To relate that search engines are examples of large IT systems	-To recognise that data is transferred across networks using agreed protocols (methods) -To recognise that connections between computers allow access to shared stored files -To explain that data is transferred in packets -To recognise computers connected to the internet allow people in different places to work together -To discuss the opportunities that technology offers for communication and collaboration

		- To recognise that choices are made when using information technology	-To identify the benefits of computer networks	on the World Wide Web -To explain how the content of the World Wide Web is created, owned, and shared by people -To explain that the World Wide Web comprises of websites and web pages -To evaluate the reliability of content and the consequences of unreliable content	-To explain the role of web crawlers in creating an index -To explain how search results are selected -To explain that ranking orders search results to make them more useful -To explain how ranking is determined by rules, and that different search engines use different rules -To explain how search engines make money by selling targeted advertising space	-To explain which types of media can be shared through the internet -To explain that communicating and collaboration using the internet can be public or private
Skills	- To recognise that some technology can be used in different ways	- To describe some uses of computers - To identify information	-To identify input and output devices -To explain that a computer system accepts an input and	-To describe some uses of the World Wide Web	-To describe the input and output of a search engine -To demonstrate that different search	-To outline methods of communicating and collaborating using the internet

	- To choose a piece of technology to do a job - To identify the main parts of a computer - To use a mouse in different ways - To use a keyboard to type -To use the keyboard to edit text - To show how to use technology safely	technology in school - To identify information technology beyond school - To show how to use information technology safely	processes it to produce an output. -To explain how a computer network can be used to share information -To explain the role of a switch server and wireless access point in a network. -To identify network devices around me -To explain how networks can be connected to other networks.	-To show how to access the World Wide Web -To discuss why a network needs protecting -To explain that there are rules to protect content -To explain why I need to think carefully before I share or reshare content -To explain why some information I find online may not be honest, accurate, or legal	terms produce different results -To evaluate the results of search terms -To compare results from different search engines -To refine my web search -To recognise the limitations of search engines	-To choose methods of internet communication and collaboration for given purposes -To evaluate different methods of online communication and collaboration -To decide what you should and should not share online
Vocabulary	technology, computer, mouse, trackpad, keyboard, screen, double-click, typing	Information technology (IT), computer, barcode, scanner/scan	digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets	internet, network, router, security, switch, server, wireless access point (WAP), website, web page, web address, routing, web browser, World Wide Web, content,	system, connection, digital, input, process, storage, output, search, search engine, refine, index, bot, ordering, links, algorithm, search engine optimisation	communication, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck,

				links, files, use, download, sharing, ownership, permission, information, accurate, honest, content, adverts	(SEO), web crawler, content creator, selection, ranking.	reuse, remix, collaboration, internet, public, private, oneway, two-way, one-to-one, one-to-many.
Creating media	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Concepts	-To describe what freehand tools do -To use the shape tool and line tools -To make careful choices when painting a digital picture -To use a computer on my own to paint a picture -To compare painting a picture on a computer and on paper	- To recognise that some digital devices can capture images using a camera - To talk about how to take a photograph - To recognise that photographs can be saved and viewed later - To recognise features of 'good' photographs - To identify how a photograph could be improved To	-To explain that animation is a sequence of drawings or photographs -To relate animated movement with a sequence of images -To plan an animation -To identify the need to work consistently and carefully -To review and improve an animation	-To identify that sound can be recorded -To identify that an input device is needed to record sound -To identify that output devices are needed to play audio -To recognise that recorded audio can be stored on a computer -To recognise that audio can be edited	-To explain the features of video as a visual media format -To recognise which devices can and can't record video -To explain the purpose of a storyboard -To recognise that filming techniques can be used to create different effects -To recognise the need to regularly	-To recognise the relationship between HTML and visual display -To recognise that web pages can contain different media types -To recognise that web pages are written by people -To recognise that a website is a set of hyperlinked web pages -To recognise components of a web page layout

		recognise features of 'good' photographs - To explain the effect of light on a photograph - To recognise that photographs can be change after they have been taken - To recognise that some images are not accurate	-To evaluate the impact of adding other media to an animation	-To recognise that sound can be represented visually as a waveform -To recognise that audio can be layered so that multiple sounds can be played at the same time -To consider the results of editing choices made	review and reflect on a video project -To identify videos can be improved through and reshooting or editing -To identify that videos can be edited on a recording device or on a computer -To explain the limitations of editing video on a recording device -To recognise projects need to be exported to be shared	-To consider the ownership and use of images (copyright) -To recognise the need to preview pages (different screens / devices) -To recognise the need for a navigation path -To recognise the implications of linking to content owned by others
Skills	- To create a picture using freehand tools - To use shape and line tools when precision is needed	- To capture a digital image - To take photographs in both landscape and portrait format	-To plan an animation using a story board -To set up the work space with an awareness of what will be captured.	-To record sound using a computer -To play recorded audio -To import audio into a project	-To use different camera angles -To use pan, tilt and zoom -To identify features of a video recording device or application	-To review an existing website (navigation bars, header) -To create a new blank web page

	- To use a range of paint colours - To use the fill tool to colour an enclosed area - To use the undo button to correct a mistake - To combine a range of tools to create a piece of artwork	- To view photographs on a digital device - To decide which photographs to keep - To hold the camera still to take a clear photograph - To use zoom to change the composition of a photograph - To consider lighting before taking a photograph - To use simple editing tools to change the appearance of a photograph - To improve a photograph by retaking it	-To capture an image -To use the onion skinning tool to review subject position -To move a subject between captures -To review a captured sequence of frames as an animation -To remove frames to improve an animation -To add media to enhance an animation -To review a completed project.	-To delete a section of audio -To change the volume of tracks in a project	-To combine filming techniques for a given purpose -To determine what scenes will convey your idea -To choose to reshoot a scene or improve later through editing -To decide what changes I will make when editing -To use split, trim and crop to edit a video	-To add text to a web page -To set the style of text on a web page -To embed media in a web page -To add web pages to a website -To preview a web page (different screen sizes) -To insert hyperlinks between pages -To insert hyperlinks to another site
Vocabulary	paint program, tool, paintbrush, erase, fill, undo,	device, camera, photograph, capture, image,	animation, flip book, stopframe, frame, sequence, image,	audio, microphone, speaker, headphones, input	video, audio, camera, talking head, panning, close	website, web page, browser, media, Hypertext Markup

	shape tools, line tool, fill tool, undo tool, colour, brush style, brush size, pictures, painting, computers	digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, framing, lighting,	photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition.	device, output device, sound, podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback.	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.	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
Programming A	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Concepts	-To explain what a given command will do -To act out a given word -To combine forwards and backwards commands to make a sequence	- To describe that a series of instructions is a sequence - To explain what happens when we change the order of instructions - To recall that a series of	-To explain that programs start because of an input -To explain what a sequence is -To identify that a program includes sequences of commands	-To relate what 'repeat' means -To identify everyday tasks that include repetition as part of a sequence, eg brushing teeth, dance moves -To explain that we can use a loop	-To explain that a condition can only be true or false -To relate that a count-controlled loop contains a condition -To compare a count-controlled loop with a	-To define a 'variable' as something that is changeable -To identify examples of information that is variable, for example, a football score during a match

	-To combine four direction commands to make a sequence -To plan a simple program -To find more than one solution to a problem	instructions can be issued before they are enacted - To recognise that you can predict the outcome of a program	-To identify that the sequence of a program is a process -To explain that the order of commands can affect a program's output -To identify that different sequences can achieve the same output -To identify that different sequences can achieve different outputs	command in a program to repeat instructions -To identify a loop within a program -To identify patterns in a sequence -To explain that in programming there are indefinite loops and count-controlled loops -To explain that an indefinite loop will run until the program is stopped -To justify when to use a loop and when not to -To explain the importance of instruction order in a loop -To recognise that not all tools enable more than one	condition-controlled loop -To explain that a condition-controlled loop will stop when a condition is met -To explain that when a condition is met, a loop will complete a cycle before it stops -To explain that selection can be used to branch the flow of a program -To explain that a loop can be used to repeatedly check whether a condition has been met -To explain the importance of instruction order in 'if...then...else...' statements	-To explain that a variable can be used in a program, eg 'score' -To define a program variable as a placeholder in memory for a single value -To explain that a variable has a name and a value -To recognise that the value of a variable can be used by a program -To recognise that the value of a variable can be updated -To identify that variables can hold numbers (integers) or letters (strings) -To define the way that a variable is changed

				process to be run at once		-To recognise that a variable can be set as a constant (fixed value) -To explain that there is only one value for a variable at any one time -To explain that if you change the value of a variable, you cannot access the previous value (cannot undo) -To explain that the name of a variable is meaningless to the computer
Skills	- To enact a given word - To predict the outcome of a command on a device - To list which commands can be	- To choose a series of words that can be enacted as a sequence - To choose a series of instructions that can be run as a program	-To build a sequence of commands -To combine commands in a program -To order commands in a program	-To list an everyday task as a set of instructions including repetition -To use an indefinite loop to produce a given outcome -To use a count-controlled loop to	-To create a condition-controlled loop -To use a condition in an 'if...then…' statement to start an action -To use selection to switch the program	-To identify a variable in an existing program -To experiment with the value of an existing variable -To choose a name that identifies the role of a variable to

	used on a given device - To run a command on a floor robot - To choose a command for a given purpose - To choose a series of words that can be enacted as a program - To choose a series of commands that can be run as a program - To build a sequence of commands in steps - To combine commands in a program	- To create a program - To trace a sequence to make a prediction - To run a program on a device - To debug a program that I have written	-To create a sequence of commands to produce a given outcome	produce a given outcome -To plan a program that includes appropriate loops to produce a given outcome -To recognise tools that enable more than one process to be run at the same time (concurrency) -To create two or more sequences that run at the same time	flow in one of two ways -To use a condition in an 'if...then...else…' statement to produce given outcomes	make it easier for humans to understand it -To decide where in a program to set a variable -To update a variable with a user input -To use an event in a program to update a variable -To use a variable in a conditional statement to control the flow of a program -To use the same variable in more than one location in a program

Vocabulary	Bee-Bot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program.	instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, artwork, design, route, mat, debugging, decomposition	Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task, design, run the code, order, note, chord, algorithm, bug, debug, code.	Logo (programming environment), program, turtle, commands, code snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled loop, value, trace, decompose, procedure.	microcontroller, USB, components, connection, infinite loop, output component, motor, repetition, count-controlled loop, Crumble controller, switch, LED, Sparkle, crocodile clips, connect, battery box, program, condition, Input, output, selection, action, debug, circuit, power, cell, buzzer	variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share, assign, declare
Data and information	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Concepts	-To label objects -To identify that objects can be counted -To recognise objects in different ways -To count objects with the same properties	- To use a tally chart to collect data - To compare objects that have been grouped by attribute - To suggest appropriate headings for tally charts and pictograms	-To investigate questions with yes/no answers -To identify attributes that you can ask yes/no questions about -To select an attribute to separate objects into two similarly sized groups	-To suggest that questions can be answered using a table of data -To identify that data can be logged over time. -To identify that sensors are input devices	-To explain that a computer program can be used to organise data -To explain that tools can be used to select data to answer questions -To outline how ordering data allows us to answer some questions	-To identify questions that can be answered using spreadsheet data -To explain what an item of data is in a spreadsheet -To explain how the data type determines how a spreadsheet can process the data

	-To compare groups of objects -To answer questions about groups of objects	- To construct (complete) a given comparison question, e.g. Are there more___ balls than___ balls. - To use a computer program to present information in different ways - To explain that we can present information using a computer - To give simple examples of why some information should not be shared	-To explain that a branching database is an identification tool -To recognise that a data set can be structured using yes/no questions -To explain that a well-structured branching database will enable you to identify objects using fewer questions -To relate two levels of a branching database using AND -To suggest real-world applications for branching databases	-To recognise that a sensor can be used as an input device for collection -To explain that a data logger captures 'data points' from sensors over time.	-To outline how operands can be used to filter data -To outline how 'AND' and 'OR' can be used to refine data selection -To explain that computer programs can be used to compare data visually -To explain that we present information to communicate a message	-To outline that there are different software tools to work with data -To explain that formulas can be used to produce calculated data -To recognise cells can be linked -To explain why data should be organised in a spreadsheet -To recognise that a cell's value automatically updates when the value in a linked cell is changed -To evaluate results in comparison to the question asked
Skills	- To collect simple data	- To show I can enter data onto a computer	-To create questions with yes/no answers -To choose questions that will divide	-To use a digital device to collect data automatically	-To choose different ways to view data -To choose which attribute and value	-To calculate data using a formula for each operation

	- To show that collected data can be counted - To describe the properties of an object - To choose an attribute to group objects by - To group objects to answer questions - To describe a group of objects (based on commonality)	- To recognise that people, animals and objects can be described by attributes - To use a computer to view data in different formats - To use pictograms to answer single-attribute questions - To use a computer to answer comparison questions (graphs, tables)	objects into evenly sized subgroups -To repeatedly create subgroups of objects -To identify an object using a branching database -To retrieve information from different levels of the branching database	-To choose an appropriate time frame when collecting data automatically -To use a set of logged data to find information -To use a computer program to sort data by one attribute. -To export information in different formats	to search by to answer a given question (operands) -To ask questions that need more than one attribute to answer -To choose which attribute to sort data by to answer a given question -To choose multiple criteria to search data to answer a given question (AND and OR) -To select an appropriate graph to visually compare data -To choose suitable ways to present information to other people	-To use functions to create new data -To use existing cells within a formula -To choose suitable ways to present spreadsheet data
Vocabulary	object, label, group, search, image, property,	more than, less than, most, least, common, popular,	attribute, value, questions, table, objects, branching,	data, table, layout, input device, sensor, logger, logging, data	database, data, information, record, field, sort, order,	data, collecting, table, structure, spreadsheet, cell,

	colour, size, shape, value, data set, more, less, most, fewest, least, the same	organise, data, object, tally chart, votes, total, pictogram, enter, data, compare, objects, count, explain, attribute, group, same, different, conclusion, block diagram, sharing	database, objects, equal, even, separate, structure, compare, order, organise, selecting, information, decision tree.	point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.	group, search, value, criteria, graph, chart, axis, compare, filter, presentation	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.
Creating media	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Concepts	- To recognise that a keyboard is used to enter text into a computer - To recognise that the Shift key changes the output of a key - To recognise that text can be edited - To recognise that the appearance of	- To identify that computers can be used to play sounds of different instruments - To identify that the same pattern can be represented in different ways -To experiment with sound using a computer	-To recognise how text and images can be used together to convey information -To define landscape and portrait as two different page orientations -To consider how different layouts can suit different purposes	-To explain that the composition of digital images can be changed -To explain that colours can be changed in digital images -To explain how cloning can be used in photo editing -To explain that images can be combined	-To identify that a vector drawing comprises separate objects -To recognise that each object in a drawing is in its own layer -To recognise that vector images can be scaled without impact on quality	-To explain that 3D models can be created on a computer -To recognise that a 3D environment can be viewed from different perspectives -To recognise that digital tools can be used to manipulate 3D objects

	text can be changed - To consider the impact of choices made	-To create music for a purpose - To compare playing music on instruments with making music on a computer	-To recognise that DTP pages can be structured with placeholders -To recognise how different font styles and effects are used for particular purposes -To consider the benefits of using a DTP application	-To combine images for a purpose -To evaluate how changes can improve an image	-To recognise that objects can be modified in groups -To explain how alignment and size guides can help create a more consistent drawing -To consider the impact of To select one object or choices made	-To show how placeholders can create holes in 3D objects -To recognise that artefacts can be broken down into a collection of 3D objects
Skills	-To use letter, number, and Space keys to enter text into a computer - To use punctuation and special characters - To use the Backspace key to remove text - To position the text cursor in a chosen location	- To experiment with musical patterns on a computer - To experiment with different sounds on a computer - To use a computer to create a musical pattern - To use a computer to compose a rhythm and a	-To show that page orientation can be changed -To organise text and image placeholders in a page layout -To add text to a placeholder -To edit text in a placeholder -To choose fonts and apply effects to text	-To recognise that digital images can be manipulated -To recognise that digital images can be changed for different purposes -To choose the most appropriate tool for a particular purpose. -To consider the impact of the changes made on the quality of the image.	-To add an object to a vector drawing -To select one object or choices made multiple objects -To delete objects -To duplicate objects using copy and paste -To modify objects -To reposition objects	-To position 3D shapes relative to one another -To use digital tools to modify 3D objects -To combine objects to create a 3D digital artefact -To use digital tools to accurately size 3D objects -To construct a 3D model which reflects a real world object

	-To use Undo - To select text - To choose options to achieve a desired effect - To change the appearance of text on a computer	melody on a given theme - To use a computer to play the same music in different ways (e.g. tempo) - To evaluate a musical composition created on a computer - To improve a musical composition created on a computer	-To add and remove images to and from placeholders -To move resize and rotate images -To review a document		-To move objects between the layers of a drawing -To group and ungroup selected objects -To combine options to achieve a desired effect -To create a vector drawing for a given purpose	
Vocabulary	word processor, keyboard, keys, letters, type, numbers, space, backspace, text cursor, capital letters, toolbar, bold, italic, underline, mouse, select, font, undo, redo, format, compare, typing, writing.	music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat, instrument, open, edit.	text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits.	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,	vector, drawing tools, object, toolbar, vector drawing, move, resize, colour, rotate, duplicate/copy, zoom, select, align, modify, layers, order, copy, paste, group, ungroup, reuse, reflection	TinkerCAD, 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, cube, cuboid, sphere, cone, prism, pyramid, placeholder, hollow, choose, combine,

				foreground, zoom, undo, font.		construct, evaluate, modify.
Programming B	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Concepts	-To choose a command for a given purpose -To show that a series of commands can be joined together -To identify the effect of changing a value -To explain that each Sprite has its own instructions -To design the parts of a project	- To describe a series of instructions as a 'sequence' - To recall that a series of instructions can be issued before they are enacted - To use logical reasoning to predict the outcome of a program -To explain that a sequence of commands has a start	-To explain that programs start because of an input -To explain what a sequence is -To identify that a program includes sequences of commands -To identify that the sequence of a program is a process -To explain that the order of commands can affect a program's output	-To develop the use of count-controlled loops in a different programming environment -To explain that in programming there are infinite loops and count controlled loops -To develop a design that includes two or more loops which run at the same time -To modify an infinite loop in a given program	-To explain how selection is used in computer programs -To relate that a conditional statement connects a condition to an outcome -To explain how selection directs the flow of a program -To design a program which uses selection -To create a program which uses selection	-To create a program to run on a controllable device -To explain that selection can control the flow of a program -To update a variable with a user input -To use a conditional statement to compare a variable to a value -To design a project that uses inputs and

	-To use my algorithm to create a program	-To decide how my project can be improved	-To identify that different sequences can achieve the same output -To identify that different sequences can achieve different outputs	-To design a project that includes repetition -To create a project that includes repetition	-To evaluate my program	outputs on a controllable device -To develop a program to use inputs and outputs on a controllable device
Skills	- To choose a series of words that can be enacted as a program - To choose a series of commands that can be run as a program - To run a program on a device	- To choose a series of words that can be enacted as a sequence - To explain what happens when we change the order of instructions - To choose a series of commands that can be run as a program - To trace a sequence to make a prediction - To test a prediction by running the sequence	-To build a sequence of commands -To combine commands in a program -To order commands in a program -To create a sequence of commands to produce a given outcome	-To modify a snippet of code to create a given outcome -To predict the outcome of a snippet of code -To choose when to use a count-controlled and an infinite loop -To choose which action will be repeated for each object -To explain the effect of my changes	-To identify conditions in a program -To recall how conditions are used in selection -To create a program with different outcomes using selection -To identify the condition and outcomes in an 'if... then… else...' statement -To use selection in an infinite loop to check a condition	-To apply my knowledge of programming to a new environment -To test my program on an emulator -To determine the flow of a program using selection -To use a variable in an if, then, else statement to select the flow of a program -To explain the importance of the order of conditions in else, if statements

		- To create and debug a program that I have written - To run a program on a device		-To develop my own design explaining what my project will do -To evaluate and refine the algorithm in my design	-To identify the setup code I need in my program -To identify ways the program could be improved	-To use an operand (e.g. <>=) in an if, then statement -To create a program based on my design -To test my program against my design -To use a range of approaches to find and fix bugs
Vocabulary	ScratchJr, command, sprite, compare, programming, area, block, joining, start, run, program, background, delete, reset, algorithm, predict, effect, change, value, instructions, design.	sequence, command, program, run, start, outcome, predict, blocks, design, actions, sprite, project, modify, change, algorithm, build, match, compare, debug, features, evaluate, decomposition, code.	motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, action, debugging, errors, setup, code, test, debug, actions.	Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify, design, algorithm, debug, refine, evaluate.	Selection, condition, true, false, count-controlled loop, outcomes, conditional statement, algorithm, program, debug, question, answer, task, design, input, implement, test, run, setup, operator	Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, sensing, accelerometer, value, compass, direction, navigation, design, task, algorithm, step counter, plan, create, code, test, debug.

Our Implementation

Organisation of topics

We follow the Teach Computing scheme of work. This scheme covers all aspects of computing and is updated to reflect the fact that in this ever-evolving digital world, pupils come to school with more technology skills and experiences than before. There is a built in progression in the scheme. For example in Year 1 and 2 creating simple algorithms for Beebots followed by Scratch algorithms in Year 3 and 4, and microbit programming in year 6. E-safety is woven throughout the scheme with a focus in each unit. There are also specific e-safety units linked with the computing systems and networks unit in each year group. We start each year with a lesson on e-safety and pupils sign a code of conduct.

We teach a balanced curriculum involving both 'skills' lessons and also using pupils' ICT capabilities to support learning across the curriculum. For example, pupils research a history topic or investigate a particular issue on the internet and present their findings within a specific program. Pupils use the collaboration aspect of our Pupil Portal to enhance group work. In science, pupils use data sensing equipment or the computer to model a problem or collate evidence through digital imagery. We encourage pupils to explore ways in which the use of computing can improve and enhance their work, for example, how a piece of writing can be edited or how the presentation of a piece of work can be improved by altering text, adding graphics, using immersive reader and identifying parts of speech. Tools on desktops like the visualiser and iPad reflector are used to share and improve work. We aim for ICT to enhance all aspects of teaching and learning.

There is progression within each unit with skills being built up lesson by lesson towards a final program or outcome. For example in the Year 4 programming B unit. They start by revising repetition, learning about loops in computing sequences, followed by using loops in their own sequences.

In each lesson, there are opportunities for revising and recapping key knowledge. Strategies used include chanting key facts, low stakes quizzes and paired discussion where one pupil teaches another.

Although skills are modelled and taught clearly, teachers are careful not to over model (especially with debugging strategies) as we want to develop pupils' independence and resilience when using technology.

We are keen for our pupils to try out programs at home and pupils have access to the programs used through our online pupil portal.

Curzon Long Term Curriculum Planning for Computing

In EYFS pupils have discrete computing sessions each week. Computing is included in continous provision. For example, chidlren use ipads to take photographs of creatures in the woods and program Bee Bots to go round a course.

Our EYFS computing curriculum provides rich opportunities for pupils to develop skills in many areas e.g.

Self-Regulation

- Set and work towards simple goals, being able to wait for what they want and control their immediate impulses when appropriate;

- Give focused attention to what the teacher says, responding appropriately even when engaged in activity, and show an ability to follow instructions involving several ideas or actions.

Managing Self

- Be confident to try new activities and show independence, resilience and perseverance in the face of challenge;

Building Relationships

- Work and play cooperatively and take turns with others;

Gross Motor skills

Negotiate space and obstacles safely, with consideration for themselves and others (beebots)

Fine Motor Skills

Use a range of small tools (mouse control, typing skills)

Understanding the World

Fostering understanding of technology around them

The Natural World

Explore the natural world around them, making observations and drawing pictures of animals and plants;

Creating with Materials

Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function (creating photographs)

Overview of units

	Computing systems and networks	Creating media	Programming A	Data and information	Creating media	Programming B
Year 1	**Technology around us** Recognising technology in school and using it responsibly.	**Digital painting** Choosing appropriate tools in a program to create art, and making comparisons with working nondigitally.	**Moving a robot** Writing short algorithms and programs for floor robots, and predicting program outcomes	**Grouping data** Exploring object labels, then using them to sort and group objects by properties	**Digital writing** Using a computer to create and format text, before comparing to writing non-digitally.	**Programming animations** Designing and programming the movement of a character on screen to tell stories.
Year 2	**Information technology around us** Identifying IT and how its responsible use improves our world in school and beyond.	**Digital photography** Capturing and changing digital photographs for different purposes.	**Robot algorithms** Creating and debugging programs and using logical reasoning to make predictions.	**Pictograms** Collecting data in tally charts and using attributes to organise and present data on a computer	**Digital music** Using a computer as a tool to explore rhythms and melodies, before creating a musical composition.	**Programming quizzes** Designing algorithms and programs that use events to trigger sequences of code to make an interactive quiz
Year 3	**Connecting computers** Identifying that digital devices have	**Stop-frame animation** Capturing and editing digital still	**Sequencing sounds** Creating sequences in a block-based programming	**Branching databases** Building and using branching	**Desktop publishing** Creating documents and modifying text,	**Events and actions in programs** Writing algorithms and programs that

	inputs, processes, and outputs, and how devices can be connected to make networks	images to produce a stop frame animation that tells a story	language to make music.	databases to group objects using yes/no questions.	images and page layouts for a specific purpose.	use a range of events to trigger sequences of actions.
Year 4	**The internet** Recognising that the internet is a network of networks including the WWW, and why we should evaluate online content.	**Audio production** Capturing and editing audio to produce a podcast, ensuring that copyright is considered.	**Repetition in shapes** Using a text-based programming language to explore count-controlled loops when drawing shapes.	**Data logging** Recognising how and why data is collected over time, before using data loggers to carry out an investigation,	**Photo editing** Manipulating digital images, and reflecting on the impact of the changes and whether the required purpose is fulfilled,	**Repetition in games** Using a block-based programming language to explore count-controlled and infinite loops when creating a game.
Year 5	**Systems and searching** Recognising IT systems in the world and how some can enable searching on the internet.	**Video production** Planning, capturing, and editing video to produce a short film.	**Selection in physical computing** Exploring conditions and selection using a programmable microcontroller.	**Flat-file databases** Using a database to order data and create charts to answer questions.	**Introduction to vector graphics** Creating images in a drawing program by using layers and groups of objects.	**Selection in quizzes** Exploring selection in programming to design and code an interactive quiz.
Year 6	**Communication and collaboration** Exploring how data is transferred by working	**Webpage creation** Designing and creating webpages, giving consideration to copyright,	**Variables in games** Exploring variables when designing and coding a game.	**Introduction to spreadsheets** Answering questions by using spreadsheets to	**3D modelling** Planning, developing, and evaluation 3D computer models of physical objects.	**Sensing movement** Designing and coding a project that captures inputs from physical devices.

	collaboratively online.	aesthetics and navigation.		organise and calculate data.		

Assessment
Strategies such as, true/false, thumbs up/down and low stakes quizzes are used to assess understanding during lessons. Teachers also observe and assess pupils' programming skills. They use their findings to provide support during lessons or to adapt future lessons. Summative data, based on the progression grids and on pupil end of unit evaluations, is recorded on Bromcom and analysed by the subject leader termly.

Impact

Summative data shows that the majority of pupils, including SEND, are working at the expected standard for computing. Our monitoring shows that pupils can explain the importance of e-safety and know how to get help if needed.

By the time our pupils leave Curzon they will:

- be competent, respectful and responsible users of ICT, equipped for life in digital society
- know how to keep themselves and others safe online and what to do if there are any issues
- be resilient and confident problem-solvers who are independent with their use of technology
- have an understanding of how technology works
- be able to program effectively and use digital media creatively