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YEAR 1 & 2 CYCLE A					
Computer systems and networks: Technology around us	**Creating Media: Digital writing**	**Programming A: Moving Robots**	**Creating Media: Digital Photography**	**Computer systems and networks: Information technology around us**	**Programming A: Robot Algorithms**
SUBSTANTIVE (CORE) KNOWLEDGE					
• Know what a computer is and what its main parts are called. • Know how to use a keyboard and how to edit using the delete key • Know how to use technology purposefully. • Know I can change the keyboard output to upper and lowercase letters. • Know using different fonts and sizes changes the appearance of my work.	• Know how to use Microsoft Word. • Know how to change the font and use bold, italic and underline.	• Know that an algorithm is a set of instructions used to solve a problem or achieve an objective. • Know that an algorithm written for a computer is called a program. • Know finding errors in an algorithm is called debugging. • Know different code blocks have different purposes.	• Know how to take a photograph, thinking about light and composition, • Know how to edit my photograph	• Know what information technology is and how it helps people at home, in school and in the wider world. • Know that devices are often linked and work together. • Know that networks are connected systems • Know rules that help keep us safe and healthy in and beyond the home when using technology	• Know computers require simple, precise instructions to perform. • Know how to identify and correct some simple errors (debugging). • Know that computer networks provide access to the internet etc.
DISCIPLINARY KNOWLEDGE					
• Identify technology • Identify the toolbar and use bold and change font and size • Type capital letters • Use the space bar • Find letters on a keyboard to type words	• Find and identify keys on a key pad. • Use a computer to write • Add and remove text on a computer using the backspace key. • Change the look of the text by using	• Use a start block in a program I can use more than one block by joining them together • Compare left and right turns • Experiment with turn and move commands	• Capture a digital photograph and talk about how to take a photograph. • Take a photograph in landscape or portrait and explain why one or other might look better.	• Recognise the uses and features of information technology: describing some uses of computers and examples of computers.	• Choose a series of words that can be enacted as a sequence. • Create different algorithms for a range of sequences using the same commands and show

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• Insert a picture from a picture box • Follow rules for using technology responsibly	bold, italic and underlining. • Make careful choices when changing text, for example, changing the font, selecting a word by double clicking or clicking and dragging. • Explain why I used the tools that I chose. • Compare writing on a computer with writing on paper	to move a physical computer • Use event, action and object code blocks • Select appropriate background artwork for a project	• Identify what is wrong with a photograph and reframe it. • Decide how photographs can be improved by using light. • Use editing to change my photograph, experimenting with colour and filters. • Identify if an image is real or if it has been changed.	• Identify information technology in school and at home and say what it is used for. • Explain the benefits of IT and how devices work together. • Recognise how to use IT responsibly and that rules are in place to keep me safe and help me.	the difference in outcomes between two sequences that have the same command. • Predict the outcome of my algorithm and compare this with what did happen. • Explain that programming projects can have code and artwork. • Design a specific algorithm to meet my goal and explain what it should achieve. • Create and debug a program that I have written
VOCABULARY					
technology, computer, mouse, trackpad, keyboard, screen, double-click, typing.	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.	Bee-Bot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program.	device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, framing, lighting,	Information technology (IT), computer, barcode, scanner/scan	instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, artwork, design, route, mat, debugging, decomposition

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YEAR 1 & 2 CYCLE B					
Data & Information: Grouping Data	**Creating media: Digital Painting**	**Programming B: Programming Animations**	**Data & Information: Pictograms**	**Creating Media: Making Music**	**Programming B: Introduction to quizzes.**
SUBSTANTIVE (CORE) KNOWLEDGE					
• Know how to group objects by their properties	• Know how to create an image using a programme. • Know how to select different tools to create different effects.	• Know that an algorithm is a set of instructions used to achieve an objective. • Know that an algorithm written for a computer is called a program and finding errors in an algorithm is called debugging.	• Know how to create a pictogram from collected data in a tally chart. • Know how to search for specific information or data. • Know that I shouldn't share personal information online.	• Know how to edit more complex digital data such as music compositions. • Know how to use a range of media in their digital content including photos, text and sound and present ideas. • Know notes in music are arranged in a sequence. Changing the order changes the sound.	• Know how write and algorithm to my design. • Know how to debug and improve my designs.
DISCIPLINARY KNOWLEDGE					
• Describe objects using labels and match objects to a group. • Count groups of objects and describe their properties. • Count and group objects with the same properties • Compare groups of objects and answer questions about them.	• Draw lines and make marks on a screen and explain which tools I used • Make marks with the square and line tools • Use the shape and line tools effectively • Use the shape and line tools to recreate the work of an artist • Explain why I have chosen specific tools	• Compare different programming tools and find and use commands to move a sprite. • Use a start block in a program and I can join blocks together. • Explain what happens when I change a value. • Add blocks to my sprite and delete a sprite.	• Count and compare objects (data) using tally charts, comparing totals. • Enter data on a computer and view that data in a different format: • Use a pictogram to answer simple questions about the data. • Use a tally chart to create a pictogram.	• Listen to music, for longer periods of time, identifying differences in pieces and say how it makes me feel. • Create a rhythm pattern and follow a rhythm pattern on a percussion instrument. • Use a computer to experiment with pitch and duration.:	• Identify that a program needs to be started and I can identify the start of a sequence. • Change the outcome of a sequence of commands; can match two sequences with the same outcome and predict an outcome. • Create a design and decide which blocks I

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		• Create an algorithm for each sprite to control movement. • Test the programs I have created and alter my designs.	• Answer 'more than'/'less than' and 'most/least' questions about an attribute. • Create a pictogram to arrange objects by attributes. • Create a pictogram to compare people by a common attribute. • Explain that we can present information using a computer and that sometimes it is this data should not be shared.	• Use a computer to create a musical pattern using three notes, refining my pattern • Create and save a musical pattern to describe an animal. • Evaluate my work stating how I could improve it. I can reopen it.	need, which background I will use and choose characters. • Create an algorithm, debug and improve by adding features.
VOCABULARY					
Group, object, property, value, label, colour, data set, more, less, most, least, fewest, the same	sort, font, size, toolbar, shift, bold, italic, shape, line, tools, space bar, insert	Scratch Jr, Bee-Bot, command, sprite, compare, programming, programming area, block, joining, start block, run, background, delete, reset, algorithm, predict, effect, change, value, Instructions, delete, algorithm, appropriate	More than, less than, most, least, organise, data, object, tally chart, votes, total Pictogram, enter, compare, objects, count, explain, more, less, more common, least common Attribute, group, same, different, more than/less than, most/least, sharing, data	music, planets, Mars, Venus, war, peace, quiet, loud, feelings, emotions, pattern, rhythm, pulse, Neptune, pitch, tempo, rhythm, notes, instrument, create, emotion, pitch, pulse/beat, open, edit	Sequence, command, program, run, program, start, outcome, predict, blocks, sprite, algorithm, design, actions, project, blocks, design, modify, change, design, build, match, compare, debug, features, evaluate

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YEAR 3 & 4 CYCLE A					
Computer systems and networks: Connecting Computers	**Creating Media: Stop frame animation**	**Programming A: Sequencing Sounds**	**Computer systems and networks: The Internet**	**Creating Media: Audio Production**	**Programming A: Repetition in shapes**
SUBSTANTIVE (CORE) KNOWLEDGE					
• Know digital devices and change the way we work • Know what a computer network is and how it works in the school setting. • Know what a switch, server and wireless access point are.	• Know how to create a stop frame animation. • Know how to add media to my animation. • Know how to use 'onion skinning.'	• Know how to write a program, run and debug it. • Know how to create a sequence of music within my program.	• Know computers are made from hardware, software and components. • Know that websites and their contents are created by people and that some information that I find online may not be honest, accurate or legal.	• Know what a podcast is. • Record a podcast, editing to make improvements and add sound.	• Know how to create a program with an object that repeats actions.
DISCIPLINARY KNOWLEDGE					
• Classify input and output devices; design a digital device and model a simple process. • Recognise similarities and differences between using digital devices and non-digital tools. • Explain how a computer network can be used to share information and that messages pass	• Explain that animation is a sequence of drawings or photographs I can create a stop frame animation and predict what it will look like. • Break down a story into setting, characters and events to create a storyboard.	• Explore a new programming environment, including attributes, projects, blocks, commands, codes, staging and backdrops. • Identify that each sprite is controlled by the commands I choose • Create a sequence of connected commands and	• Explain how the internet is made up of connected networks. • Explain how websites are stored on the www, what types of media can be shared and how to access websites on the WWW. • Explain that that content of the www is created by people.	• Identify digital devices that can record sound and play it back and that a range of sounds can be recorded. • Plan and record a podcast, saving it as a file. • Discuss how to improve my podcast and edit sections of an audio recording. • Reopen my recording and add sound, using	• Create a code snippet for a given purpose, for example controlling a turtle. • Write an algorithm for a given outcome, including repetition. • Design a program that has a count-controlled loop. • Debug my program.

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through multiple connections. • Explain how digital devices can be connected and what the role of a switch, server and wireless access point is. • Recognise the physical components of a network and how they are connected.	• Evaluate the quality of my animation and review a series of frames to check my work. • Review and improve an animation explaining how I will improve it. • Evaluate the impact of adding other media to my animation	decide where and how my program will start. • Combine sound commands and order notes into a sequence to create a musical instrument. • Change the appearance of my project • Create a project from a task description	• Evaluate the consequences of unreliable content. • Name the different parts of a desktop computer and know what the function of the different parts of a computer is. E.g. • Make a leaflet labelling a computer	editing tools to rearrange sections of audio.	
VOCABULARY					
Digital device, input, output, process, program, connection, network, network switch, network switch, server, wireless access point (WAP)	Animation, flip book, stop frame animation, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency evaluation, animation, delete, frame, media, import, transition	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, stage, costume, backdrop, design, algorithm, bug, debug	internet, network, router, network, security, switch, server, wireless, access point (WAP), web page, web address, links, files, content, download, sharing, ownership, permission, information, accurate, honest, adverts, legal.	audio, record, playback, microphone, speaker, headphones, input, output, sound, start, stop, pause, save, file, edit, section, mixing, time shift.	program, turtle, commands, code, snippet, algorithm, design, debug, logo, command, pattern, repeat, repetition, count controlled loop, value, count-controlled, loop, trace, decompose, procedure, debug, program

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YEAR 3 & 4 CYCLE B

Data & Information: Branching Databases	Creating Media: Desktop publishing	Programming B: Events and actions in programs	Data & Information: Data Logging	Creating Media: Photo editing	Programming B: Repetition in games
SUBSTANTIVE (CORE) KNOWLEDGE					
• Know how to carefully structure a branching database, identifying attributes for grouping and yes/no questions.	• Know how to create a template, add text and images. • Know how to change text layout, including font size and colour. • Know how to alter the layout to suit my purpose.	• Know how to make my sprite move and I can select keys to do this (up, down, left, right) • Know how to add blocks and use function such as pen down.	• Know how to use a data logger to collect data. • Know that sensors are the input devices and that the data is recorded.	• Know how to edited an image. • Know how to adjust, sharpen, brighten, alter and image. • Know how to change hue, saturation, change colour or use settings such as sepia.	• Know how to add loops to a program.
DISCIPLINARY KNOWLEDGE					
• Create a branching database by grouping groups of objects separated by one attribute. • Make up yes/no questions about these groups. • Identify the object attributes needed to collect relevant data • Explain why it is helpful for a database to be well structured • Compare the information shown in a pictogram with a branching database	• Recognise how text and images convey information clearly and that there are some advantages and disadvantages to using them. • Change the text layout, including font style, size and colour. • Choose appropriate page settings: generating a template to meet my needs with placeholders. • Add content to a desktop publishing publication, including	• Explain how a sprite moves in an existing project • Create a program to move a sprite in four directions • Adapt a program to a new context • Develop my program by adding features • Identify and fix bugs in a program I can design	• Explain that data gathered can be used to answer a given question and suggest questions to be asked of the data. • Use a data logger to collect data and that the data logger collects 'data points' from sensors over a given time. • Use collected data to answer questions and draw conclusions.	• Explain the effect that editing can have on an image. • Change the composition of an image by selecting parts of it. • Use editing tools on a photograph and can explain the effect these have. • Evaluate how changing can improve an image. • Save and retrieve an image.	• Develop the use of count-controlled loops in a different programming environment, for example scratch. • Explain that in programming there are infinite loops and count controlled loops. • Develop a program which includes two or more loops which run at the same time. • Modify an infinite loop

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	adding text and pasting pictures. • Change the layout to suit different purposes. • Consider the benefits of desktop publishing and identify its use in the real world.				
VOCABULARY					
Attribute, value, questions, table, objects, branching database, database, , equal, even, separate, order, organise, value, question, j2data, selecting, pictogram, compare, information, decision tree	Text, images, advantages, disadvantages, communicate, font, font style, template, landscape, portrait, orientation, placeholder, desktop publishing, copy, paste, layout, purpose, benefits	Motion, event, sprite, algorithm, logic, move, resize, algorithm Extension block, pen up, set up, pen, design, actions, debugging, errors, setup	data, table, input device, sensor, data logger, data point, interval, analyse, data set, import, export, logged, collection, review, conclusion.	image, edit, arrange, select, crop, undo, save, copyright, pixels, rotate, flip, adjustment, effects, colours, hue/ saturation, sepia, save, version, illustrator, vignette, retouch, edit, clone, recolour, image, fake, real, composite, cut, copy, paste, background, foreground.	scratch, programming, sprite, blocks, code, loop, repeat, value, forever, count controlled loop, costume, animate,

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YEAR 5 & 6 CYCLE A					
Computer systems and networks: Systems and searching	**Creating Media: Video Production**	**Programming A: Selection in physical computing**	**Computer systems and networks: Communication and collaboration**	**Creating Media: Webpage Creation**	**Programming A: Variables in games**
SUBSTANTIVE (CORE) KNOWLEDGE					
• Know how to search the internet and that I will get different results from different search engines. • Know that web crawlers are digital bots that find what I am looking for. • Know how to keep myself safe online and that I should not be sharing personal information. • Know that if I am communicating online, that my conversations may not be private. •	• Know how to use Windows Movie Maker and I can edit my video to improve it. • Know how to add audio, set my video to music, add a title and credits and change the transition method and length between sections or stills.	• Know how to create algorithms for physical computing using loops and sequences. • Know the importance of planning and designing a project in order to follow a plan and make adjustments where necessary.	• Know that connect devices can allow is to access shared files stored online. • Know that sharing information online lets people in different places work together.	• Know how to plan and create a web page, adding content and hyperlinks. • know that some images have copyright.	• Know how to design my game, write the algorithms, create the artwork, test and debug.
DISCIPLINARY KNOWLEDGE					
• Search the web for specific information and identify and compare results from different search engines. • Explain that web crawlers are the digital bots that	• Explain that a video can hold visual and audio media. • Plan a video using a storyboard. I can make a recording taking into account light and angles.	• Control a simple circuit connected to a computer; including a microcontroller (crumble), an infinity loop and an LED light. • Connect more than one output device to a microcontroller,	• Explain how computers are connected together to form systems. • Explain the role that computers have in our lives and how information is	• Explore a webpage and identify the different types of media that are used in its construction and its common features.	• Define a 'variable' as something that is changeable, variables can hold numbers or letters. • Explain why a variable is used in a program; it is a place

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search the internet for index pages for web address. • Explain web pages are ranked and how search engines make money. Identify that there are different ways to communicate over the internet	• Reshot, edit and improve my video and include special effects, title screen and end credits	deciding which output device • Control with a count-controlled loop. • Experiment with a 'do until' loop. I can use selection (an 'if ...then' statement) to direct the flow of a program. • Make a physical drawing/model of a physical computing project. • Create an algorithm to control my robot/simulation using repetition, sequencing, coordinates and text inputs.	transferred over the internet. • Work collectively on a shared project online. • Evaluate different ways of working together online.	• Plan a design for a webpage that suits my purpose. • Find suitable images and consider the ownership of these images. • Add content to my page, make edits and preview it on a different device. • Make multiple pages and link them using hyperlinks. • Evaluate my the users experience of a website.	holder in memory for a single value. • Choose how to improve a game by using variables. • Design a project that builds on a given example: choosing artwork and creating the algorithm. • Use my design to create a project, testing the code that I have written. • Evaluate my project
VOCABULARY					
Search, search engine, Google, Bing, Yahoo!, Swisscows, DuckDuckGo, refine Index, crawler, bot, search engine, ranking, search engine, search engine optimisation, links, web crawlers, selection, ranking, communication, internet, public, private, oneway, two-way, one to one, one to many, SMS, email, WhatsApp, blog,	Video, audio, AV, recording, capture, zoom, storage, digital, tape, save, videographer, technique, pan, tilt, content, light, camera, angles, export, lighting, setting, computer, split, edit, timeline, transition, special effects, title screen, end credits, export, constructive, feedback.	Microcontroller, Crumble controller, components, switch, motor, LED, Sparkle, crocodile clips, connect, battery box, program, condition, true, false, input, output devices, selection, condition, action, task, design, selection, repetition, condition, action, microcontroller, Crumble controller, switch, crocodile clips,	system, connection, digital, input, process, output, protocol, address, packet, chat, explore, slide deck, reuse, remix, collaboration	Website, web page, browser, media, Hypertext Mark up Language (HTML), Website, web page, breadcrumb trail, navigation, hyperlink, subpage, evaluate, implications, external link, embed, copyright, fair use.	variable, change, name, value, set, change, event, design, algorithm, code, task, artwork, program, debug, improve, evaluate, share.

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YouTube, Twitter, BBC Newsround		battery box Task, design, selection, repetition, algorithm, debug, evaluate			

YEAR 5 & 6 CYCLE B					
Data & Information: Flat-file databases	**Creating Media: Vector drawing**	**Programming B: Selection in quizzes**	**Data & Information: Spreadsheets**	**Creating Media: 3D Modelling**	**Programming B: Sensing movement**
SUBSTANTIVE (CORE) KNOWLEDGE					
• Know how to create a database. • Know that a database is a program that is used to store information (attributes) and that you can ask questions (search) a database for answers. • Know that you can create graphs and charts to represent your answers. •	• Know how to create an image using vector drawing. • Know how to use a range of tools with in the program.	• Know how to use scratch to create a quiz. • Know how to add a loop.	• Know how to format cells to perform a function and that spreadsheets can be used to present data visually. • Know to credit sources when inserting media from websites and to check their validity. • Know data can be presented numerically or visually, each for different purposes.	• Know how to create a 3D object using a computer program.	• Know how to control multiple variables on a physical computing device.
DISCIPLINARY KNOWLEDGE					
• Create a database, using fields which hold and record the data. • Search a database using 'and' and 'or.'	• Use drawing tools to produce different outcomes and for different purposes. • Create a vector drawing by combining shapes	• Explain how selection is used in a program and identify conditions and how to modify them. • Create a program with different	• Create a formula in a spreadsheet for simple conversions e.g. cm to m and use formulas to calculate the perimeter of a rectangle.	• Use a computer to create and manipulate three-dimensional (3D) digital objects	• Create a program to run on a controllable device • Explain that selection can control the flow of a program

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• Apply filters and select an appropriate chart or graph to visually compare data. • Apply my knowledge of a database to ask questions that will need more than one field to answer.	and I can move, resize, rotate and duplicate them. • Use tools to achieve a desired effect, for example using the zoom tool to add detail to my drawing. • Create layers bring objects to the front or the back. • Evaluate my vector drawing and say how I might improve it.	outcomes using selection and identify the condition and outcome is an if... then... else statement. • Explain how selection directs the flow of a program • Design and create a program which uses selection: creating the algorithms, running the program and debugging.	• Work collaboratively to solve a problem using spreadsheets. • Use simple formulae to solve calculations including =sum and other statistical functions. • Present data visually using graphs. • Decide which keys are more suitable to perform a task. E.g. Numerical keys when typing long numbers.	• Compare working digitally with 2D and 3D graphics • Construct a digital 3D model of a physical object • Identify that physical objects can be broken down into a collection of 3D shapes • Design a digital model by combining 3D objects • Develop and improve a digital 3D model	• Update a variable with a user input • Use a conditional statement to compare a variable to a value • Design a project that uses inputs and outputs on a controllable device • Develop a program to use inputs and outputs on a controllable device
VOCABULARY					
Database, data, information, record, field, sort, order, group, search, criteria, graph, chart, axis, compare, filter, presentation	vector, drawing tool, shapes, object, icon, toolbar, move, resize, colour, rotate, duplicate/ copy, organise, zoom, select, alignment grid, handles, consistency, modify, layers, front, back, order, copy, paste, group, ungroup, improvement, evaluate, alternatives, vector drawing	Selection, condition, true, false, outcomes, conditional statement - the linking together of a condition and outcomes- algorithm, program, debug, Task, design, algorithm, input, program, selection, condition, outcomes, test, run, implement, share, evaluate, constructive	Spreadsheet, data, data heading, data set, cells, columns and rows, object, spreadsheet application, format, common attribute, formula, calculation, cell reference, operation, range, duplicate, sigma Propose, question, organised, graph, chart, evaluate, results, comparison, questions, software, tools, data	2D, 3D, 3D object, 3D space, view, resize, colour, lift, rotate, position, select, duplicate, dimension, placeholder, hole, group, ungroup, design, modify, evaluate, improve.	micro:bit, make code, input, process, output, flashing, USB, selection, condition, if... then.... Else, variable, random, sensing, accelerometer, compass, direction, design, task, algorithm, step counter, plan, code, test, debug.