Sir Alexander Fleming Primary School: Computing Progression

		Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing Systems and Networks	Declarative Knowledge	I know some everyday examples of technology I know some uses of technology.	I know that technology can help us communicate. I know I can communicate using technology. I know that different devices are used for different purposes. I know the success or failure of an action. I know that we control computers. I know the basic parts of a computer, e.g. screen, keyboard.	I know that technology helps us. I know that information can be stored on a computer. I know that not all technology is electronic. I know that a computer is an example of technology. I know that choices are made with technology, and this is why rules are important.	I know that there are different types of computers used in school. I know the features of information technology. I know that information technology benefits us.	I know that computers need input and output devices. I know that devices in a network are connected to one another. I know the benefits of computer networks.	I know that networks connect and communicate with each other and that together, the global interconnection of networks makes up the Internet. I know that the World Wide Web (WWW) is a collection of websites and webpages, and that the Internet enables us to view these. I know that the WWW content can be created by anyone and shared with everyone I know that information on the internet may not always be accurate.	I know that that a computer system is a collection of inputs, processes and outputs, and how they play a role in our lives. I know that computers have protocols and rules to follow, so that information can be shared over the internet, using 'packets' of information. I know that search engines use algorithms to organise search results. I know that different users may receive different search results. I know the benefits of computers in our lives and how they enable collaborative projects	I know that there are several search engines, and I can explain how search results are found, ordered and 'ranked' I know that algorithms influence the information shown online. I know some limitations of search engines. I know that the order of results is important, and to whom, and understand some of the limitations of search engines. I know what 'communication' is and discuss the opportunities that technology offers for communication.
	Procedural Knowledge	I know how a computer/ robot is on or off. I know how to follow simple instructions to control a digital device such as an on and off button and in this way know that we control computers.	I know how to log on to a device with support. I know how to open and close an application safely. I know how to repeat an action with technology to trigger a specific outcome. I know how to follow simple instructions to control a digital device. I know how to input a short sequence of instructions to control a device.	I know how to choose a piece of technology to do a job, recognising that technology can be used in different ways. I know how to identify and use parts (including a mouse and keyboard) of a computer. I know how to use technology safely. I know how to save and retrieve my work with support.	I know how computers are used. I know how to identify information technology in and beyond school. I know how to use information technology safely.	I know how different input and output devices are used. I know how network devices around me connect to one another. I know how switches, servers and wireless access points can be used in a network to share information.	I know how devices physically connect on the internet. I know how the World Wide Web is different to the Internet. I know how to evaluate the different types of content that can be created for the WWW and evaluate its reliability, the usefulness of content created, and the consequence of unreliable content.	I know how to identify inputs, processes, and outputs in a variety of computer systems. I know how computers "talk" to one another, across a network system in different countries, using 'packets' of information or data. I know how to use a computer system to collaborate a project.	I know how to compare different search engines and explain why search results might be different, when searching for the same thing. I know how to evaluate the results of search terms and identify those results from search engines can include adverts, and that the adverts can be targeted at specific audiences. I know how to compare information from multiple online sources before deciding if it is trustworthy. I know how to identify ways to communicate without technology and evaluate different methods of online communication effectively.
Vocabulary		computer, tablet, phone, game, on, off, button	robot, screen, keyboard	computer, mouse, trackpad, keyboard, screen, technology, double-click, typing	information technology, computer, barcode, scanner, scan	network, data, server, wireless access points (WAPs), network switch, router, input, process, output, Wi-Fi, Bluetooth.	network, data, World Wide Web, Internet, web page, website, content, media, copyright.	Internet, computer system, packet, data, network, router, network switch, Wi-Fi, World Wide Web, input, output, process, IP address	address bar, search box, World Wide Web, search engine, web crawler, PageRank, ranking, communication, search terms.

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Creating Media	Declarative Knowledge	I know that you can create different things using a device	I know that you can access content on a digital device.	I know what different freehand tools do, including how computers can be used to create art. I know that I can adjust a tool to suit my needs, deciding on the appropriate tool for use and considering the impact of my choices. I know that paintings made with a computer are different to painting with brushes. I know that a keyboard enters text and changes the output of a key. I know that text can be edited and changed. I know the impact of choices made.	I know that devices can capture images using a camera. I know that photographs can be improved, including the use of light. I know that some photos are not accurate. I know editing can change the meaning a photograph communicates. I know that computers can be used to play sounds of different instruments that may be represented as patterns. I know that music played on a computer can have differences played on an instrument.	I know that text and images can be structured, using placeholders, to convey information. I know that different document layouts can suit different purposes. I know that there are benefits and reasons why I might use a DTP application. I know that different layouts can suit different purposes (landscape versus portrait) I know what placeholders are and how they can help to structure a document. I know that different font styles and effects are used for particular purposes.	I know that images can be changed for different purposes. I know that not all images are real, and that they can be manipulated. I know the impact of the changes made can affect the quality of the image. I know that that sound can be digitally recorded. I know that a digital recording is stored as a file. I know that digital audio can be edited in layers. I know that audio effects can change how a recording sounds.	I know the key concepts of video composition. I know that I need to plan and create a video storyboard, capture video according to my plan and edit my finished product. I know what a vector drawing is, and that different tools can be used to modify them. I know that objects can be layered and grouped, or sent backwards / forwards and how to do this. I know that a vector images can be modified in a variety of ways, without impacting on quality, and can demonstrate this	I know that a website is a set of hyperlinked web pages and understand that the relationship between HTML and what appears on the webpage. I know about the ownership and use of images (copyright) on a website. I know the need for a navigation pathway in webpage design. I know that accessibility is important when designing websites. I know that a 3D environment can be viewed from different perspectives. I know that placeholders can create holes in 3D objects. I know that artefacts can be broken down into a collection of 3D objects.
	Procedural Knowledge	I know how to make marks using digital drawing technology. I know how to use a touchscreen or appropriate access device to target and select options on screen.	I know how to operate a digital device with support to fulfil a task e.g. take a photo. I know how to create simple digital content, e.g. digital art. I know how to select tools in order to create a picture using drawing technology. I know how to use different digital devices. I know how to use a mouse, touchscreen or appropriate access device to target and select options on screen.	I know how to create a picture using freehand tools, shape and line. I know how to use a range of paint colours and use the fill tool when needed. I know how to use the undo button to correct a mistake I know how to use a keyboard to enter or remove text, including letters, numbers or special characters. I know how to select and change the position of text in a document. I know how to choose options to achieve a desired effect including changing the appearance of text.	I know how to capture a digital image, in either landscape or portrait mode. I know how to discuss photographs including their composition, how to take them and ways to use them, digitally. I know how to use the zoom on the camera to change the composition of the photos and consider the use of light before taking my photo. I know how to use filters to edit the appearance of the photo. I know how to experiment with musical sounds and patterns on a computer. I know to use a computer to create a pattern, rhythm, and a melody on a theme. I know how to evaluate and improve music composed on a computer.	I know how to add, delete, resize, and rotate images to and from placeholders in a document. I know to add, edit, and change text, applying appropriate fonts, sizing and styles to suit the purpose of the document. I know how to reorientate a page, organising placeholders to suit the purpose and review my document, making changes where necessary. I know how to add and organise text and image placeholders in a page layout, using a suitable style (landscape or portrait). I know how to add and remove images and text, to and from placeholders. I know how to edit font size and apply effects to it and move / resize images in placeholders. I know how to evaluate whether a layout effectively communicates information to an audience.	I know how to change the composition of images, including arranging images, cropping images, and editing out part of an image. I know how to apply changes to the whole image or part of an image, including adjusting colours, adding filters, adding effects, retouching. I know how to add to an image, including drawing, add text, add an element (e.g.: borders, etc) I know how to use a digital device to record sound I know how audio can be changed through editing. I know how different types of audio can be combined and played together.	I know how to use a video recording device to carry out the following functions: recording, panning, focussing, zooming and editing specific recording effects (e.g. Filters.) I know how to identify improvements to my video and can consider the effect of editing choices made. I know how to locate, playback and transfer / export video I have recorded. I know how to edit video. I know how to evaluate a video against its intended audience and purpose. I know how to improve a video following feedback. I know how to describe a vector drawing and create it as a 2D drawing on a screen. I know how to group and layer objects on a screen and evaluate the impact of my choices. I know how to use a variety of modifying tools to change a vector drawing, by selecting, rotating, dragging, repositioning, adding, recolouring, resizing and grouping objects	I know how to review an existing webpage (navigation bars, header) I know how to create a new blank webpage and add text, images, change styles of font, and embed media. I know how to design a website that is easy for users to navigate. I know how to insert hyperlinks between pages and links to another site. I know how to position 3D shapes and use digital tools to modify 3D objects. I know how use digital tools to accurately size 3D objects and combine them to create a 3D digital artefact. I know how to construct a 3D model which reflects a real world object.
Vocabulary		Draw, colour, photo	Photograph, touch, tools	paint program, tool, paintbrush, erase, fill, undo, primary colours, shape tools, line tool, fill tool, undo tool, Henri Matisse, Wassily Kandinsky, feelings, colour, brush style, Georges Seurat, pointillism, brush size	Device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format feelings, emotions, pattern, rhythm, pitch, tempo, notes, create, pitch, pulse/beat, tempo, instrument, rhythm, notes, open, edit	Text, image, font, resize, orientation, portrait, landscape, placeholder, edit, template, layout, desktop publishing (DTP) Layout, landscape, portrait, placeholders, font, style, edit, right click, left click, group/ ungroup	Image, filters, cropping, editing, composition, select, group, clone.	Vector drawing, layer, group, modify, 2D objects. Storyboard, panning, zooming, editing, filters, cropping, exporting.	Webpage, HTML, hyperlink, navigation pathway, header, links, copyright, fair use. Perspective, 3D, digital tool, artefact, object, placeholder.

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Computational Thinking Focus		Follow simple instructions. Explore technology through tinkering. Notice patterns and routines.	Follow instructions in the correct order. Begin to identify when something has gone wrong. Create simple algorithms through play.	Focus Concepts: Algorithms, Debugging, Tinkering Follow and create simple algorithms. Spot and correct simple mistakes.	Focus Concepts: Algorithms, Debugging, Evaluation Test programs. Explain why a program does or does not work. Make improvements.	Focus Concepts: Decomposition, Patterns, Debugging Break problems into smaller steps. Identify repeating patterns in code.	Focus Concepts: Patterns, Decomposition, Logic Recognise repeated sequences. Make predictions about program behaviour.	Focus Concepts: Logic, Abstraction, Evaluation Compare different solutions. Select the most efficient solution. Explain why a solution works.	Focus Concepts: Abstraction, Evaluation, Logic Simplify solutions by removing unnecessary detail. Evaluate and refine programs independently. Apply logical reasoning to explain algorithms.
Programming	Declarative Knowledge	I know I can press buttons to make something happen. To know that if I press or use different buttons there will be a different outcome.	I know that instructions tell something what to do. I know that objects can be instructed to do something. I know that instructions must be followed in the correct order.	I can recognise, explain and match a command to an outcome. I know that a program is a set of commands that a computer can run. I know that a series of instructions can be issued before they can be enacted. I know what a command does. I know that mistakes in programs are called bugs. I know that debugging means fixing bugs.	I know different commands, matching them to their appropriate outcome. I know a program is a set of commands that can run. I know a series of instructions is a 'sequence' I know a series of instructions can be issued before they are enacted. I know that debugging means finding and fixing errors in a program.	I know a program includes a sequence of commands. I know that the order of commands can affect a program's output. I know that different sequences can achieve different outputs, or the same output. I know what a sequence is, and understand its process. I know that breaking a problem into smaller parts makes it easier to solve. I know that some programs can make choices.	I know that programs can repeat actions and make simple decisions. I can understand and identify 'loops' of repeated code within programs as repeating sets of instructions. I know that looped code within programs can run for an indefinite amount of time, or a specified number of times. I know when to use a looped instruction in my program and justify its use. I know that a loop command can be used to repeat instructions in a program. I know that you can program a loop to stop after a specific number of times. I know the importance of instruction order in a loop and justify when to use a loop and when not to.	I know that sequence, selection and repetition are the three main programming structures. I know that a conditional statement, using 'If... then...' statements can either be true or false. I know that a loop can be used to check whether a condition has been met or not, and that it can stop when the condition has been met. I know that a condition can only be true or false I know the difference between a count-controlled loop (e.g. repeat until x=10, then stop all) I know that a loop can be used to repeatedly check whether a condition (if...then...else) has been met. I know that computers use inputs to make decisions. I know that physical computing systems have inputs and outputs.	I know that variables store data that can change. I know that a variable is something that can be changed in a program. I know that variables can be letters or numbers. I know that variables have specific names and can be used by programs to change outcomes. I know that a variable is something that can be changed, in a program. I know that programs can combine variables, selection and repetition
	Procedural Knowledge	I know how to press buttons to get an outcome. I know how to press different buttons to get different outcomes.	I know how to give and follow simple instructions. I know how to give an instruction to a robot and watch the outcome. I know how to use simple commands to follow a sequence. I know how to identify when instructions have not worked as expected.	I know how to predict and then run my command on a floor robot. I know how to choose a series of commands that can be run as a program. I know how to build a sequence of commands that can be run a program on a device. I know how to predict the outcome of a command on a device. I know how to build a sequence of commands in a program. I know how to spot and correct a simple error in a sequence of instructions.	I know how to predict and run a command on a given device. I know how to list commands, giving commands for a given purpose. I know how to choose a series of commands that can be run as a program, building a sequence of commands in steps. I know how to run a program on a device. I know how to choose a series of words and commands that can be enacted as a sequence or a program. I know how to make and test a prediction. I know how to create, debug and run a program that I have written.	I know how to build, combine and correctly order commands in a sequence, to produce a desired output. I know how to change the sequence of a program to make it more efficient. I know how to decompose a problem before creating a program.	I know how to use a controlled loop or an indefinite loop to produce a specified output. I know how to plan a program the at includes loops to produce a given outcome. I know how to create two or more sequences that can run at the same time. I know how to use an indefinite (forever) loop in a program, to produce a given outcome. I know how to use a count-controlled loop (e.g.: repeat x 10) in a program, to produce a given outcome. I know how to create two or more sequences of code in a program, that run at the same time. I know how to create simple selection statements.	I know how to define a sequence as being the order of instructions in a program, selection as being the outcome of a conditional statement, and repetition as a count-controlled loop in a program, which stops when a condition is met. I know how to use a condition in an 'if.... then..' statement to produce a given outcome, and then show that a condition can switch program flow in one of two ways. I know how to experiment with a 'repeat until' loop, changing counts and events within the loop. I know how to create a condition-controlled loop (e.g., repeat until x=10, then stop all) I know how to use a condition in an 'if...then..else..' statement to start an action, in order to switch program flow in one of two ways. I know how to use inputs from sensors to control outputs.	I know how to identify variables in existing programs and experiment with changing them. I know how to decide where in a program to set a variable and use an event to update it. I know how to use a variable in a condition statement to control the flow of a program. I know how to design and write a program which uses inputs on a device or emulator to achieve a specified output. I know how to use logical reasoning to explain how my program works. I know how to spot error in my code, debug them and suggest improvements. I know how to evaluate and improve a program through systematic testing.
Vocabulary		Button, move	robot, press, tools, instruction	Commands, move, forwards, backwards, left, right, sprite, algorithms, turn, clear, go, , instructions, directions, plan, program, route.	sequence, debug, run, outcome, predict, blocks, design, sequence, modify, change, build, compare, evaluate, features	decompose, decomposition, selection, variables, output, algorithms, programs, code, block-based coding, scratch, sprite, staging area, code block, event block, control blocks, action, pen, stage, selection, repetition, debug, pattern, problem solving	Repetition, loop, indefinite, count-controlled, count-controlled loops, infinite loops, repetition, logo, input, output.	Condition, condition-controlled loop, Crumble controller, scratch, (if.. then...statements.) or infinite, statement, LED, sparkle	variable, string, outcome, abstraction. Micro:Bit, emulator, input, sensor, output, step counter, conditional statement, testing, iteration, refinement

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Data and Information	Declarative Knowledge	I know that objects can be labelled. I know objects can be sorted. I know that information can be organised into groups.	I know that objects have similarities and differences.	I know that objects can be counted. I know different ways that information can be presented. I know that data is information collected to answer questions.	I know that a tally chart can be used to collect data, suggesting appropriate headings. I can use a computer program to present information, in different ways, explaining my reasoning in each case. I can give examples of why some information should not be shared.	I know that a branching database is an identification tool and know how it works. I know attributes that you can ask yes/ no questions about. I know real-world applications for branching databases.	I know that sensors collect data automatically. I can recognise that sensors can be used to gather data to answer a specific question. I understand what type of data to collect in order to answer a specific question. I can explain that a data logger captures data from specific points in time, using an appropriate environmental sensor.	I can explain that a computer program can be used to organise data. I know that databases allow data to be searched efficiently. I can outline how operands (questions) can be used to filter data and outline how 'AND' and 'OR' can be used to refine selection. I can explain that we present information to communicate a message and that computer programs can be used to compare data visually.	I can explain what data is, and that it needs a context. I know a range of the different types of software that deal with and organise data. I can organise and present data appropriately and effectively, evaluating my data presentation and results in comparison to the questions asked. I know that formulas can automate calculations. I know that spreadsheets can be used to model real-life situations.
	Procedural Knowledge	I know how to label objects verbally. I know how to sort objects based on a characteristic.	I know how to label objects. I know how to group objects based on similarities and differences.	I know how to collect simple data and show that collected data can be counted. I know how to group objects to answer questions, understanding that objects can be grouped by similarities (attribute). I know how describe a group of objects (based on commonality).	I know how to collect and record data digitally. I know how to enter and view data on a computer. I know how people, animals and objects can be described by attributes. I know how to use a computer to answer single-attribute and comparison questions.	I know how to create questions with yes/no answers. I know how to choose questions that will divide objects into evenly sized smaller groups. I know how to identify an object using a branching database and retrieve information from different levels of the database.	I know how to place a sensor to collect specific data to answer a question. I know how to identify a time frame and appropriate sensor to use, in order to capture data to answer a specific question. I know how to collect, analyse, evaluate and present data, in order to answer a specific question.	I know how to choose different ways to view data, and choose which attribute and value to search b, to answer a given question (operand). I know how to choose multiple criteria to search data, in order to answer a given question (AND and OR). I know how to select an appropriate graph to visually compare data, and choose suitable ways to present data to other people.	I know how to give examples of data types and contexts in which they may be used. I know how to identify and use data handling software and input, present and evaluate data. I know how to apply formulas to data, explaining how my data presentation represents the answer to a specific question.
Vocabulary		Same, not the same	Different, group	Object, label, group, search, image, property, colour, size, shape, value, data set, more, less, most, fewest, the same.	most, least, organise, data, tally chart, votes, total, Pictogram, enter, data, tally chart, compare, count, pictogram, tally, attribute, same, data	Branching database, attribute/ property, yes/no questions, data, information.	Sensor, data, information, data-logger, timeframe, input, output	Operand, data, information, selection., field, parameter, flat-file database.	data, spreadsheet, cell, formula, select, duplicate, input, output, column, row, format, function, SUM, AVERAGE, MIN, MAX, graph, chart

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Oracy	I liked / I disliked...	I think that... I made this because...	The purpose of this is ... In my opinion, I feel that I can improve this by...	I believe this is (good / bad) because .... I found the process / skill of ... the most challenging because...	Based on my design criteria, I believe ... I believe this was ambitious because... You could improve this design by...maybe you could try... I used the process / skill of .... because ...	I can transfer the skill of... to ... The problems I faced were.... I overcame these by... I believe the strengths / weaknesses are evident in the...	Based on the design brief I have been presented with.... In my opinion, the success of this was... However, ... Possible improvements may include... This has met / has not met the brief because ... Alternatively, I believe the _____ would be more suited to...	I have come to the conclusion that... The evidence / facts lead to... The computer aided design helped me to... To create my _____, it was essential to understand... When I began to critique my _____, I found that... The functional properties, which I am proud of, are...