MANLEY PARK
PRIMARY SCHOOL
GROWING TOGETHER

EYFS STATUTORY FRAMEWORK

How does the EYFS enable children to access the National Curriculum in Computing?

The Early Years Foundation Stage – Background

Prior to the new EYFS Curriculum (2021) there was a 'Technology' strand within the Specific Area of 'Understanding the World'. The 2021 EYFS Curriculum removed the Technology strand but it is important to acknowledge that Computing (and, more broadly, 'Technology') learning should still be facilitated within the EYFS. Our children are growing up in a world in which technology is integrated into so much of their lives. It is our responsibility to ensure that our children leave the EYFS with a strong foundation of both knowledge and skills to prepare them not just for the expectations of the National Curriculum in Year 1 and beyond but the realities of modern life.

Not only does a well-planned EYFS curriculum provide children with the knowledge they need to access Computing as a subject in Year 1, it also supports the development of their cross-curricular skills and learning behaviours including:

Communication and language

Computational Thinking

Creative thinking

Problem-solving

Team work

What does 'Computing' look like in the EYFS?

'Computing' in the EYFS can look like discrete teaching (e.g. e-safety circle times or using an app on an iPad as a way of demonstrating knowledge / skills in another curriculum area) or it can be evidenced when children are exploring the world and learning through technology in a wider sense. Examples could be

- taking a photograph with a camera or tablet
- searching for information on the internet
- playing games on the interactive whiteboard
- exploring a typewriter or other mechanical toys
- using a floor robot like a BeeBot
- watching a video clip as a stimulus for another curriculum area
- listening to music – e.g. using iPods, audio only devices such as Yoto Players

It is also important to remember that 'Computing' within the new EYFS Curriculum should involve many play-based, 'unplugged' activities and opportunities that focus on building children's communication and language skills, behaviours for learning, curiosity and creativity and problem solving. Opportunities to apply Computational Thinking approaches should pervade the learning culture within EYFS classrooms.

Computational Thinking in the EYFS

'Computational Thinking' is a set of problem solving skills that we can use in everyday life. These are the problem-solving skills that were pinpointed by a number of computer scientists when they looked at how they solved problems. Often, but not always, the solutions they came up with involved building some kind of technology to help them solve the problem, but always they involved these problem solving skills - Computational Thinking skills. Interestingly, children in Early Years are already using and learning about Computational Thinking, as The Early Learning Goals, Characteristics of Learning and Guiding Principles are peppered with Computational Thinking approaches and skills. By aligning EYFS provision to Computational Thinking, we use the same vocabulary as used in KS1 and beyond, and ensure progression.

EYFS Computational Thinking Skills	**Definitions**
Tinkering	Playing and exploring
Making	Making, checking and fixing things

Collaboration	Playing and working collaboratively (together)
Persevering	Not giving up
Logic	Anticipating and explaining - logical reasoning
Pattern	Grouping things, comparing, spotting similarities and differences, working out rules
Abstraction	Naming and labelling, working out what is important, sticking to the main theme, ignoring what is not important, creating a summary
Algorithms and Decomposition	Responding to instructions, ordering things, sequencing things, introducing storylines, working out different ways to do things, breaking problems down into steps

Cross-reference of the EYFS Computational Thinking to Characteristics of Effective Learning

	Playing and Exploring	Active Learning	Creative and Critical Thinking
Tinkering	✓	✓	
Making			✓
Collaboration			
Persevering	✓	✓	
Logic	✓		✓
Pattern	✓		✓
Abstraction	✓		✓
Algorithms and Decomposition	✓		✓

BRIDGING INTO THE NATIONAL CURRICULUM

Early Learning Goals in the new EYFS Curriculum relevant to the National Curriculum in Computing

The ELGs should support teachers to make a holistic, best-fit judgement about a child's development.

The table below outlines the most relevant statements taken from the Early Learning Goals in the EYFS statutory framework and the Development Matters age ranges for Three and Four-Year-Olds and Reception to match the programme of study for Computing.

The following statements linked to Computing are taken from the following areas of the EYFS curriculum: • Personal, Social and Emotional Development • Physical Development • Understanding the World • Expressive Arts and Design.

Computing		
Three and Four-Year-Olds	Personal, Social and Emotional Development	Remember rules without needing an adult to remind them.
	Physical Development	Match their developing physical skills to tasks and activities in the setting.
	Understanding the World	Explore how things work
Reception	Personal, Social and Emotional Development	Show resilience and perseverance in the face of a challenge. Know and talk about the different factors that support their overall health and wellbeing -sensible amounts of 'screen time'
	Physical Development	Develop their small motor skills so that they can use a range of tools competently, safely and confidently
	Expressive Arts and Design	Explore, use and refine a variety of artistic effects to express their ideas and feelings

ELG	Personal, Social and Emotional Development	Managing Self	Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. Explain the reasons for rules, know right from wrong and try to behave accordingly
	Expressive Arts and Design	Creating with Materials	Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function

NATIONAL CURRICULUM

National Curriculum

Purpose of study

A high-quality Computing education equips pupils to use **computational thinking** and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology and provides insights into both natural and artificial systems. The core of Computing is **computer science**, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through **programming**. Building on this knowledge and understanding, pupils are equipped to use **information technology** to create programs, systems and a range of content. Computing also ensures that pupils become **digitally literate** – able to use information and communication technology to express themselves and develop their ideas. Pupils' skills and knowledge enable them to operate at a level suitable for the future workplace and as active participants in a digital world.

Aims

The National Curriculum for Computing aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation

- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Subject Content - Where the National Curriculum is covered at MPPS

Key Stage 1

Pupils should be taught to:

NC Objectives	Year 1	Year 2
understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions	✓	✓
create and debug simple programs	✓	✓
use logical reasoning to predict the behaviour of simple programs	✓	✓
use technology purposefully to create, organise, store, manipulate and retrieve digital content	✓	✓
recognise common uses of information technology beyond school	✓	✓
use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	✓	✓

Key Stage 2

Pupils should be taught to:

NC Objectives	Year 3	Year 4	Year 5	Year 6
design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	✓	✓	✓	✓
use sequence, selection, and repetition in programs; work with variables and various forms of input and output	✓	✓	✓	✓
use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	✓	✓	✓	✓
understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration	✓	✓		✓
use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	✓		✓	
select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	✓	✓	✓	✓
use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.		✓		✓

Aims - The National Curriculum for Computing aims to ensure that all pupils:

- **can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation**

Year Group	Project 1	Project 2	Project 3
Nursery	*See 'Bridging into the National Curriculum'*		
Reception			
Year 1	**Moving a robot** ABSTRACTION Learners have to understand concepts such as 'forward' and 'backward' as abstract concepts that can be captured and stored. They then apply this understanding as they program bots to achieve a goal LOGIC Learners have to understand that a sequence of instructions produces a logical outcome - the order of instructions produces actions in the same order. They then apply this understanding to predict the outcome of a program ALGORITHMS Learners understand that commands can be given to a device. They apply this as they input and then develop their own algorithms for achieving a goal - the robot getting to where it needs to go.	**Grouping Data** DATA REPRESENTATION Learners understand that objects can be identified by attributes They then apply this as they collect, group and count the data	**Programming animations** ABSTRACTION Learners understand that the idea of 'forward' and 'backward' are, again, abstract concepts, and that these can apply not just to real physical movement in the real world, but to virtual characters too. This is then extended to allow learners to 'abstract away' the idea of a jump in the real world and to apply this abstracted aspect within a virtual environment. They apply this as they explore and create sequences controlling virtual characters, using commands abstracted from real life. LOGIC Learners understand that they can use prediction to debug errors in their programs They apply this as they seek to understand the behaviour of the sprite on screen, and to predict and control the final outcome. ALGORITHMS Learners understand that the order of instructions for the sprite governs the order execution for its behaviour.

			They apply this as they choose the order of commands in a sequence
Year 2	**Robot Algorithms** ABSTRACTION Learners understand that a series of instructions are called a sequence, and that a stored sequence can be enacted. They apply this as they choose a series of words that can be enacted as a sequence. LOGIC Learners understand that that you can predict the outcome of a program They apply this as they trace a longer sequence to make a prediction ALGORITHMS Learners understand that changing the order of instructions in a sequence can change the outcome of the program They apply this as they show the difference in outcomes between two sequences that consist of the same commands	**Pictograms** DATA REPRESENTATION Learners understand that data can be compared and used to answer questions. They then apply this as they collect and analyse data, using to formulate and answer different comparison questions.	**Programming quizzes** ABSTRACTION Learners understand that a sequence of instructions has a start and an outcome. They apply this as they design and create a program that achieves a given outcome LOGIC Learners understand that the outcome of a sequence can be predicted. They apply this as they compare the outcome of their project to their designed intention. ALGORITHMS Learners understand that they can change the outcome of a sequence of commands They apply this as they seek to debug and improve their projects.
Year 3	**Sequencing sounds** ABSTRACTION Learners develop their understand of sequences and that these sequences can be collected into processes They apply this as they produce processes	**Branching databases** DATA REPRESENTATION Learners understand that data can be captured in a database and organised by attribute, and that the database can be structured using yes/no questions.	**Events and actions in programs** ABSTRACTION Learners understand that sequences are activated by an initiating event, and that this event can be an input from a user. They apply this as they design and create

	that will activate note blocks to create music LOGIC Learners understand that in problem solving their processes, they can follow the flow of the commands. They apply this to identify and debug errors in their code processes ALGORITHMS Learners understand that the order of the command in the processes govern the output from the device. They apply this as they identify that different sequences can achieve the same output or different outputs	They then apply this as they create and use a database and retrieve information from the database using yes/no questions, and relate two levels of the database using the AND operation	sequences that respond to user input and trigger corresponding actions LOGIC Learners understand that unexpected outputs are caused by bugs in their code They apply this as they trace their code sequences to trackdown and resolve unintended actions from their code ALGORITHMS Learners understand that there will need to be multiple processes running at the same time to achieve the richness of output required They apply this as they design, create and develop programs with multiple processes to achieve a goal.
Year 4	**Repetition in shapes** ABSTRACTION Learners understand that a sequence can be looped back on itself so that it repeats a number of times They apply this as they create programs that use count-controlled loops to achieve a goal LOGIC Learners understand that the current ‘place’ within the looping program ‘flow’ can be traced and followed mentally. They apply this as they develop and debug the code they’ve written using count-controlled loops	**Data logging** DATA REPRESENTATION Learners understand that a data logger captures ‘data points’ from sensors over time They then apply this as they use data loggers to log data, and then sort and analyse this data to find information	**Repetition in games** ABSTRACTION Learners understand that a sequence can be looped back on itself so that it repeats an indefinite number of times They apply this as they create programs that use indefinite loops to achieve a goal LOGIC Learners understand that the current ‘place’ within the infinitely looping program ‘flow’ can be traced and followed mentally. They apply this as they develop and debug the code they’ve written using indefinite loops

	ALGORITHMS Learners understand that it is clearer and more efficient to loop back over existing code rather than to write out the same code multiple times They apply this as they develop count controlled, looping algorithms to achieve a goal		ALGORITHMS Learners understand that it is sometime necessary to use an indefinite loop to solve a coding problem They apply this as they develop indefinite looping algorithms to achieve a goal
Year 5	**Selection in physical computing** ABSTRACTION Learners understand that access to parts of a process can be controlled using selection They apply this as they build examples of physical computers and code processes that use selection LOGIC Learners understand that they can trace the flow of execution through a process that uses selection They apply this as they develop and debug their processes that use selection ALGORITHMS Learners understand that selection can be used to solve problems They apply this as they develop programs that use selection to solve problems	**Flat-file databases** DATA REPRESENTATION Learners understand that data and information can be stored, grouped and organised using fields within a database They then apply this as they create databases using fields and attributes, and use these databases to answer questions	**Selection in quizzes** ABSTRACTION Learners understand that program flow within a process can be 'forked' using selection They apply this as they develop solutions that 'fork' program flow LOGIC Learners understand that they can trace the flow of execution through a process that uses forked selection They apply this as they develop and debug their processes that use forked selection ALGORITHMS Learners understand that forked selection can be used to solve problems They apply this as they develop programs that use forked selection to solve problems
Year 6	**Variables in games** ABSTRACTION Learners understand that information that is variable in nature can be captured, stored, and accessed as a 'variable' in code	**Spreadsheets** DATA REPRESENTATION Learners understand that spreadsheets can be used to collect and analyse data	**Sensing movement** ABSTRACTION Learners understand that a program can be transferred and from one device to another, and that it can be run on the new device;

	They apply this as they create simple examples of processes that use variables LOGIC Learners understand that the value of a variable can be predicted as they follow program flow They apply this as they develop and debug processes that use variables ALGORITHMS Learners understand that they can develop processes that control the value of a variable They apply this as they develop processes that control variables as solutions to given problems	They then apply this as they collect data and analyse it using spreadsheets, and use the spreadsheets to find out information to solve given problems/questions	learners understand the concepts of less than, greater than and equal to can be used in computer processes They apply this as they build programs on computers that use inequality operators to solve problems, and then transfer and run these programs onto physical devices LOGIC Learners understand that they can trace the flow in a program that uses inequalities They apply this as they debug programs on computers that use inequality operators to solve problems. ALGORITHMS Learners understand that some problems require the use of inequalities to solve them They apply this as they develop algorithmic solutions using inequalities to solve given problems

- **can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems**

Year Group	**Project 1**	**Project 2**
Nursery	See *'Bridging into the National Curriculum'*	

Reception		
Year 1	**Moving a robot** Learners have to analyse and develop a programming solution for how to move a robot in response to input commands	**Programming animations** Learners have to analyse and develop a programming solution for how to achieve a specific animation on screen.
Year 2	**Robot Algorithms** Learners have to analyse and develop a programming solution for how to get a robot to a specific location, considering how to develop more complex algorithms to achieve this.	**Programming quizzes** Learners have to analyse and develop a programming solution for how to develop a quiz for a computer user, and to have the program respond to the users input
Year 3	**Sequencing sounds** Learners have to analyse and develop a programming solution for how to order and sequence commands for a computer that govern the pitch, rhythm and tempo of a piece of music.	**Events and actions in programs** Learners have to analyse and develop a programming solution for how to have a program that can respond to a set of different user driven events and with a set of specific actions.
Year 4	**Repetition in shapes** Learners have to analyse and develop a programming solution for how to have repeating shapes drawn onto the screen using count-controlled loops	**Repetition in games** Learners have to analyse and develop a programming solution for how to use indefinite loops to control program flow in a computer game
Year 5	**Selection in physical computing** Learners have to analyse and develop a programming solution for how to have a physical computer respond to user input using selection.	**Selection in quizzes** Learners have to analyse and develop a programming solution for how to use branching program flow (if… then… else…) to respond appropriately to answers input from a user.
Year 6	**Variables in games** Learners have to analyse and develop a programming solution for how to use variables in a program to make a computer game.	**Sensing movement** Learners have to analyse and develop a programming solution for how physical computers use inequalities with variables to sense and respond to movement in the world.

- **can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems**

How and what analytical evaluation and analytical application of information technology will the children engage with in order to solve problems.

Year Group	Project 1	Project 2	Project 3
Nursery			
Reception			
Year 1	**Digital painting** Choosing appropriate tools in a program to create art, and making comparisons with working non-digitally.		
Year 2	**Digital photography** Capturing and changing digital photographs for different purposes.		
Year 3			
Year 4			
Year 5			
Year 6			

National Curriculum Progression - KS1

Year Group	Programming			Creating media	Data and information	Computing systems and networks	Safety and security
	understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions	create and debug simple programs	use logical reasoning to predict the behaviour of simple programs	use technology purposefully to create, organise, store, manipulate and retrieve digital content		recognise common uses of information technology beyond school	use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other

							online technologies
Year 1	Understand how commands can be given to a device Understand and show that instructions can be joined together and then followed as a group of instructions Choose commands for a given purpose Test whether their algorithms are effective Produce alternative algorithms/programs to achieve the same outcome Identify the effect of changing a value Understand that multiple sets of instructions can run at the same time	Understand what instructions are Predict the outcome of a sequence of instructions Follow the algorithm step by step Compare and experiment with turn and move commands to move a robot Starting to form own programs, explaining the intended goal Design the parts of a project Test and debug simple program Use an algorithm to create a program Identify several possible solutions Plan two programs Use two different programs to get to the same place	Match a command to an outcome Act out a series of instructions Compare forwards and backwards movements Predict the outcome of a command on a device Run a command on a device Predict the outcome of a sequence involving forwards and backwards commands Start a sequence from the same place Predict the outcome of a sequence involving up to four commands Choose the order of commands in a sequence Explain what a program should do	**Painting** Manipulate items on screen with click/drag inputs Open a program using input Explain what different freehand tools do, and use these to create a picture Save work Recognising that computers can be used to create art. Use a range of tools and colours to make artwork in the style of a given artist **Using keyboards and pointing devices** recognise and use a keyboard to enter text into a computer Use shift to changes the output of a key, and to use punctuation and capital letters Recognise that text can be edited Recognise and demonstrate selection, cursor positioning, backspace and undo to edit text	**Pictograms** Identify attributes and properties of objects collect simple data show that collected data can be counted explain that objects can be grouped by similarities (attribute) describe a group of objects (based on commonality) recognise that information can be presented in different ways	explain how technology help us recognise that a computer is an example of technology locate examples of technology in the classroom choose a piece of technology to do a job recognise that some technology can be used in different ways identify the main parts of a computer	recognise that choices are made when using technology explain why rules are needed when using technology show how to use technology safely

				Recognise and demonstrate that appearance of text can be changed			
Year 2	describe that a series of instructions is a sequence choose a series of words that can be enacted as a sequence explain what happens when we change the order of instructions show the difference in outcomes between two sequences that consist of the same commands Plan algorithms for different parts of a task	choose a series of instructions that can be run as a program Assemble different parts of algorithms as programs create a program composed of different parts run a program on a device debug programs and parts of programs that they have written Improve a program by adding features	recognise that you can predict the outcome of a program trace a sequence to make a prediction use the same instructions to create different algorithms Identify different 'routes' to the same outcome, and represent these as algorithms Match two sequences with the same outcome	**Image captures** recognise that some digital devices can capture images using a camera capture a digital image and view it on a digital device recognise and demonstrate that photographs can be saved and viewed later hold the camera still to take a clear photograph, capturing pictures in both landscape and portrait format explain the effect of light and consider this before taking photos recognise features of 'good' photographs and improve a photograph by retaking it control the effect of a photograph though use of filters, zoom and editing. **Music making** identify that computers can be	use a tally chart to collect data, suggesting appropriate headings recognise that people, animals and objects can be described by attributes, and use these to make comparisons enter and view data on a computer in different formats use a computer to answer comparison questions (graphs, tables) Talk about and present information using a computer in different ways construct (complete) a given comparison question	recognise different types of computers used in school identify that a computer is a part of information technology describe some uses of computers recognise the features of information technology talk about uses of information technology identify information technology in school identify information technology beyond school explain how information technology benefits us	say how rules for using information technology can help us recognise that choices are made when using information technology – recognise that photographs can be changed after they have been taken recognise that some images are not accurate – give simple examples of why some information should not be shared

				used to play sounds of different instruments compare playing music on instruments with making music on a computer identify that the same pattern can be represented in different ways experiment with different sounds and musical patterns on a computer use a computer to create a musical pattern, and compose a rhythm and a melody on a given theme use a computer to play the same music in different ways (e.g. tempo) evaluate and improve a musical composition created on a computer			

National Curriculum Progression - KS2

Year	Programming	Computing systems and	Creating media	Safety and

Group				networks			security
				Data and information			
	design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	use sequence, selection, and repetition in programs; work with variables and various forms of input and output	use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration	use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact
Year 3	explain that programs start because of an input combine commands in a program create a sequence of commands to produce a given outcome	explain what a sequence is identify that a program includes sequences of commands identify that the sequence of a program is a process build a sequence of commands Identify input and output devices	Follow a process in a program order commands in a program explain that the order of commands can affect a program's output identify that different sequences can achieve the same output or different outputs	describe what an input is explain that a process acts on the inputs explain that an output is produced by the process identify input and output devices identify how changing the process can affect the output explain that a computer system accepts an input and processes it to produce an output recognise that a digital device is made up of several parts recognise that computers can be connected to each other	**Branching databases** investigate and create questions with yes/no answers identify attributes that you can ask yes/no questions about select an attributes and choose questions that will to separate objects into two similarly sized groups explain that a branching database is an identification tool recognise that a data set can be structured using yes/no questions identify an object using a branching database retrieve information from different levels of the branching database	**Stop-frame animation** explain that an animation is made up of a sequence of images identify that a capturing device needs to be in a fixed position set up the work area with an awareness of what will be captured plan an animation using a storyboard capture an image use the onion skinning tool to review subject position move a subject between captures recognise that smaller movements create smoother animation	

				identify the benefits of computer networks identify network devices around me Identify how devices In a network are connected with one another recognise that a network is made up of a number of components explain how a computer network can be used to share information explain how networks can be connected to other networks explain the role of a switch, server, and wireless access point in a network explain how information is passed through multiple connections	relate two levels of a branching database using AND suggest real-world applications for branching databases	explain the need for consistency in working review a captured sequence of frames as an animation remove frames to improve an animation explain the impact of adding other media to an animation add media to enhance an animation review a completed project explain that a project must be exported so it can be shared – **Desktop publishing** recognise how text and images can be used together to convey information define landscape and portrait and show that page orientation can be changed recognise that DTP pages can be structured with placeholders add/edit/remove text and images to a placeholders and organise text and	

						image placeholders in a page layout recognise how different font styles and effects are used for particular purposes, and choose fonts and apply effects to text move resize and rotate images review a document and consider the benefits of using a DTP application	
Year 4	list an everyday task as a set of instructions including repetition recognise tools that enable more than one process to be run at once (concurrency), but that not all tools afford this. plan a program that includes appropriate loops to produce a given outcome create two or more sequences that run at the same time justify when to use a loop and when not to	relate what 'repeat' means, and identify everyday tasks that include repetition as part of a sequence, eg brushing teeth, dance moves explain that we can use a loop command in a program to repeat instructions explain that in programming there are indefinite loops and count-controlled loops explain that an indefinite loop will run until the program is stopped use count-controlled and/or indefinite loops to produce given outcomes, justifying choices.	identify patterns in a sequence identify a loop within a program explain the importance of instruction order in a loop Debug and correct errors in programs that use loops	describe how networks connect to other networks explain that the global interconnection of networks is the internet recognise that the World Wide Web is part of the internet, and how it can be used to share information explain that the World Wide Web comprises of websites and web pages describe how to access the World Wide Web describe the types of content/media that can be added, created, and shared on the World Wide Web		**Audio Production** identify that sound can be recorded record sound using a computer, and recognise that it can be stored there recognise that audio can be edited play recorded audio import audio into a project recognise that sound can be represented visually as a waveform delete a section of audio recognise that audio can be layered so that multiple sounds can be	recognise the need for security on the internet explain that there are rules to protect content explain how the content of the World Wide Web is created, owned, and shared by people explain why we need to think carefully before sharing or reshare content Plan appropriate content to publish e.g. what to put into a podcast explain why some information found online may not be honest, accurate, or legal

		identify that an input device is needed to record sound identify that output devices are needed to play audio		describe the current limitations of World Wide Web media explain the benefits of the World Wide Web		played at the same time change the volume of individual tracks in a project consider the results of editing choices made **Data logging** suggest questions that can be answered using a table of data identify data that can be logged over time identify that sensors are input devices, and that they can be used for data collection use a digital device to collect data automatically choose how often to automatically collect data samples explain that a data logger captures ‘data points’ from sensors over time use a set of logged data to find information use a computer program to sort data by one attribute export information in different format	

						Photo editing recognise that digital images can be manipulated recognise that digital images can be changed for different purposes use an application to change the whole of a digital image in a range of ways, e.g: adjusting colour, cropping and applying filters use an application to change part of a digital image, e.g: select part of a digital image, use clone, copy, and paste to change the composition, and retouching use an application to add to the composition of a digital image. E.g: to add text to choose the most appropriate tool for a particular purpose consider the impact of changes made on the quality of the image	
Year 5	use a condition in an 'if...then...else...' statement to produce given outcomes	explain that a condition can only be true or false relate that a count-controlled loop contains a condition	explain the importance of instruction order in 'if...then...else...' statements		recognise that a system is a set of interconnected parts which work together explain that computers can be connected	explain the features of video as a visual media format recognise which devices can and can't record video	

	Use conditions to control physical systems	compare a count-controlled loop with a condition-controlled loop explain that a condition-controlled loop will stop when a condition is met explain that when a condition is met, a loop will complete a cycle before it stops create a condition-controlled loop use a condition in an 'if...then...' statement to start an action explain that selection can be used to branch the flow of a program use selection to switch the program flow in one of two ways explain that a loop can be used to repeatedly check whether a condition has been met	Write algorithms that describes what a physical system will do Debug errors in algorithms and programs that use selection		together to form IT systems identify that data can be transferred between IT systems recognise inputs, processes, and outputs in large IT systems describe the role of a particular IT system in their lives relate that search engines are examples of large IT systems describe the input and output of a search engine demonstrate that different search terms produce different results explain why search engines create indices, and that they are different for each search engine explain the role of web crawlers in creating an index explain how search results are selected explain that ranking orders search results to make them more useful explain how ranking is determined by rules, and that different	identify features of a video recording device or application use different camera angles, and use pan, tilt and zoom combine filming techniques for a given purpose **Video Production** recognise that filming techniques can be used to create different effects explain the purpose of a storyboard determine what scenes will convey an idea recognise the need to regularly review and reflect on a video project explain the limitations of editing video on a recording device identify that videos can be edited on a recording device or on a computer identify videos can be improved through and reshooting or editing choose to reshoot a scene or improve later through editing	

					search engines use different rules explain why the order of results is important and to whom explain how search engines make money by selling targeted advertising space identify some of the limitations of search engines evaluate the results of search terms — outline how ordering data allows us to answer some questions explain that tools can be used to select data to answer questions outline how operands can be used to filter data choose which attribute and value to search by to answer a given question (operands) ask questions that need more than one attribute to answer outline how 'AND' and 'OR' can be used to refine data selection choose which attribute to sort data by to	decide what changes I will make when editing use split, trim and crop to edit a video recognise projects need to be exported to be shared **Flat-file databases** explain that a computer program can be used to organise data choose different ways to view data explain that computer programs can be used to compare data visually select an appropriate graph to visually compare data explain that we present information to communicate a message choose suitable ways to present information to other people **Vector Drawing** identify that a vector drawing comprises separate objects Add, select and delete vector objects to a vector drawing	

					answer a given question choose multiple criteria to search data to answer a given question (AND and OR)	recognise that each object in a drawing is in its own layer move objects between the layers of a drawing Duplicate, modify, reposition objects group and ungroup selected objects recognise that grouped objects can be modified as a group explain how alignment and size guides can help create a more consistent drawing recognise that vector images can be scaled without impact on quality combine options to achieve a desired effect create a vector drawing for a given purpose	
Year 6	design and develop a project that uses inputs and outputs on a controllable device	define a 'variable' as something that is changeable identify examples of information that is variable, for example, a football score during a match explain that a variable can be used in a program, eg 'score'	Trace the state of a variable Predict the state of a variable at given points of a given program execution Plan algorithms that use variables Use a range of approaches to find and	recognise that data is transferred across networks using agreed protocols (methods) recognise that connections between computers allow access to shared stored files explain that data is transferred in packets		review an existing website (navigation bars, header) recognise the relationship between HTML and visual display recognise that web pages can contain different media types	decide what you should and should not share online explain that communicating and collaboration using the internet can be public or private explain that communication on the internet may not be

		define a program variable as a placeholder in memory for a single value explain that a variable has a name and a value identify a variable in an existing program recognise that the value of a variable can be used by a program experiment with the value of an existing variable recognise that the value of a variable can be updated identify that variables can hold numbers (integers) or letters (strings) define the way that a variable is changed recognise that a variable can be set as a constant (fixed value) choose a name that identifies the role of a variable to make it easier for humans to understand it explain the importance of setting up a variable at the start of a program (initialisation)	fix bugs in programs that use variables	recognise computers connected to the internet allow people in different places to work together discuss the opportunities that technology offers for communication and collaboration outline methods of communicating and collaborating using the internet choose methods of internet communication and collaboration for given purposes evaluate different methods of online communication and collaboration explain which types of media can be shared through the internet		recognise that a website is a set of hyperlinked web pages recognise components of a web page layout create a new blank web page add text to a web page and change its appearance set the style of text on a web page embed media in a web page Recognise the need for previewing pages (different screens / devices), and to use preview to support page development recognise the need for a navigation path add web pages to a website insert hyperlinks between pages and on to other sites **Spreadsheets** identify questions that can be answered using spreadsheet data explain what an item of data is in a spreadsheet explain how the data type determines how a	private, and the need to exercise caution recognise that web pages are written by people Understand the consider the ownership and use of images (copyright) recognise the implications of linking to content owned by others

		decide where in a program to set a variable update a variable with a user input experiment with different physical inputs use an event in a program to update a variable use a variable in a conditional statement to control the flow of a program explain that there is only one value for a variable at any one time explain that if you change the value of a variable, you cannot access the previous value (cannot undo) explain that if you read a variable, the value remains use the same variable in more than one location in a program explain that the name of a variable is meaningless to the computer and must be unique				spreadsheet can process the data outline that there are different software tools to work with data explain that formulas can be used to produce calculated data calculate data using a formula for each operation recognise cells can be linked use functions to create new data explain why data should be organised in a spreadsheet use existing cells within a formula recognise that a cell's value automatically updates when the value in a linked cell is changed evaluate results in comparison to the question asked choose suitable ways to present spreadsheet data **3D Modelling** explain that 3D models can be created on a computer	

						position 3D shapes relative to one another recognise that a 3D environment can be viewed from different perspectives use digital tools to modify 3D objects recognise that digital tools can be used to manipulate 3D objects combine objects to create a 3D digital artefact show how placeholders can create holes in 3D objects use digital tools to accurately size 3D objects recognise that artefacts can be broken down into a collection of 3D objects construct a 3D model which reflects a real world object	

MANLEY PARK
PRIMARY SCHOOL
GROWING TOGETHER

Key Stage One

Internal Excel Documentation - Teach Computing

Key Stage Two

Internal Excel Documentation - Teach Computing