The Brow Primary School Progression Ladder for Computing

Computing Progression	Control & Algorithms	Programming and Development	Data and Representation Modelling Simulations	Hardware and Processing	Understanding Technologies *Electronic Communication* *Research* *Networks* *E-Safety*	Information Technology *Multimedia, Digital Imagery, animation, sound and music*
Foundation Stage Emerging	Understands simple instructions. Begins to follow simple procedures.	Uses a simple program on a computer or a device.	Begins to recognise the different forms of data. Graphs, lists, webpages and tables. Begins to collect and interpret simple sets of data.	Begins to operate simple equipment e.g. turns on CD player and uses a remote control.	Begins to understand how computers can be linked together. Begins to understand email and websites.	Begins to know that information can be retrieved on computers.
Foundation Stage Expected/Year 1 Emerging	Can understand and follow instructions and begin to write own algorithms.	Completes a simple program on a computer or device. Begins to write own program/sequences.	Uses data to answer questions e.g. favourite colour of class. Uses computers to make a table or list of data. Begins to collect data on a data logging device. Begin to recognise that digital content can be in many forms.	Uses ICT hardware to interact with age appropriate computer software. Start to recognise that computers need programs to function.	Uses digital devices and computers to communicate e.g. webcams. Accesses and saves information on a class network folder. Begins to obtain content from the world wide web using a web browser.	Use computer devices and software to create, research and store data. Uses drawing software to design a poster for a purpose. Knows some common uses of information technology beyond the classroom.

Foundation Stage Exceeding/Year 1 Expected	Begin to understand what an algorithm is. Begin to write a simple set of instructions for a purpose using symbols.	Knows that users can develop their own programs. Demonstrates this by creating simple programs e.g. on programmable robots to produce different outcomes. Executes, checks and changes programs. Understands that programs execute by following precise instructions.	Recognises that digital content can be represented in many forms. Begins to distinguish between some of these forms and can explain the different ways that they communicate information. Organises, stores, edits and manipulates data in different digital formats. Work as a class/ individually to use a simple pictogram/bar chart program to develop simple graphical awareness and one to one correspondence. Make choices to control a simple simulation program.	Understands that computers have no intelligence and can do nothing unless a program is used. Show an understanding of the range of devices and tools encountered in everyday life. Recognises that all software executed (used) on digital devices is programmed (look at examples)	Show an awareness of information sources both on and off screen. Show an awareness that something created digitally on a computer / tablet can be shared with others via another device (printer, projector, apple TV, Obtains content from the world wide web using a web browser. Understand the importance of communicating safely and respectfully on line and the need for keeping personal information private. Knows what to do when concerned about content or being contacted. Contribute ideas to a class email / blog to other classes/ peers.	Uses software under supervision to create, store and edit digital content using appropriate files and folder names. Work with others to contribute to a digital class resource including text, graphics and sound. Understands that people interact with computers. Use a range of tools in a graphics package to crate and manipulate images. Choose suitable sounds from a bank to express ideas. Record short speech. Shares their use of technology in school. Knows common use of information technology outside school. Talks about their work and makes changes to improve it.

Year 1 Exceeding/Year 2 Emerging	Understands what an algorithm is. Writes a set of instructions for a purpose using symbols, numbers and words. Understands that computes need precise instructions. Shows care and precision to avoid errors.	Knows that users can develop their own programs. Demonstrates this by creating simple programs e.g. on programmable robots,. Executes, checks and changes programs. Understands that programs execute by following precise instructions. Begins to use logical reasoning to predict the behaviour of programs.	Recognises that digital content can be represented in many forms. Begins to distinguish between some of these forms and can explain the different ways that they communicate information. Organises, stores, edits and manipulates data in different digital formats.	Understands that computers have no intelligence and can do nothing unless a program is used. Recognises that all software executed (used) on digital devices is programmed (look at examples) Begin to recognise and use a range of input and output devices e.g robotics. Starts to understand how programs specify the function of a general purpose computer.	Obtains content from the world wide web using a web browser. Understand the importance of communicating safely and respectfully on line (e-safety) and the need for keeping personal information private. Knows what to do when concerned about content or being contacted. Begins to carry out simple web searches to collect digital content.	Uses technology with increasing independence to purposely organise digital content. Shows awareness of the quality of digital content collected. Uses software to manipulate and present digital content: data and information. Shares their experiences of technology in school and outside school. Talks about their work and makes some improvements to solutions based on feedback received.
Year 2 Expected	Understands what an algorithm is and is able to express simple linear (non-branching) algorithms as symbols. Understands that computers need precise instructions. Demonstrates care and precision to avoid errors. Understand that algorithms are used on digital devices as programs. Control a device, on and	To plan ahead and develops their own programs e.g. robots. Uses arithmetic operators and what if statements and loops within programs. Uses logical reasoning to predict the behaviour of programs and detects and corrects simple semantic errors i.e. debugging.	Recognises the different types of data e.g. text and number. Appreciates that programs can work with different types of data. Collect, organise and classify data structured in tables and graphs to make it useful when answering questions. Confidently organises, stores, edits and manipulates data in a range of digital formats	Recognises that a range of digital devices can be considered a computer (look at examples). Recognises and uses a range of input and output devices (e.g. robotics) Understands how programs specify the function of a general purpose computer. Show an awareness of a range of inputs to a computer (IWB, Mouse, keyboard, screen,	Navigates the web and can carry out simple web searches to collect digital content. Save and retrieve information from the internet. Navigate websites using tabs, hyperlinks, back and forward buttons, home button. Understand that computers can be linked to share resources. Demonstrates use of	Uses technology with increasing independence to purposely organise digital content. Shows awareness of the quality of digital content collected. Uses software to manipulate and present digital content: data and information. Save and retrieve work. Use a range of tools in a paint package / image manipulation to modify an

	off screen. Simple algorithms using loops and selection (as statements). Uses logical reasoning to predict outcomes. Detects and corrects errors (debugging) in algorithms.		including branching databases, trees and databases and use it to answer questions. Begins to recognise the difference between data and information . Play and adventure game and use simple choices observing the results. Understand that computers are good at replicating real life events and allow them to explore contexts that are not usually possible.	microphone, microscope) and wireless technology.	computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online. Work collaboratively by email to share and request information safely and respectfully.	image when communicating an idea or desired effect. Create simple animations to tell a story. Compose music using icons. Produce simple presentations including sounds captured or created. Shares their experiences of technology in school and outside school. Talks about their work and makes some improvements to solutions based on feedback received.
Year 2 Exceeding/End of Key Stage	Understands what an algorithm is and is able to express simple linear (non-branching) algorithms as symbols. Understands that computers need precise instructions. Demonstrates care and precision to avoid errors. Understand that algorithms are used on digital devices as programs. Designs simple algorithms	Develops their own programs e.g. robots. Uses arithmetic operators and what if statements and loops within programs. Uses logical reasoning to predict the behaviour of programs and detects and corrects simple semantic errors i.e. debugging. Begins to create programs that implement algorithms to achieve	Recognises the different types of data e.g. text and number. Appreciates that programs can work with different types of data. Recognises that data can be structured in tables to make it useful. Confidently organises, stores, edits and manipulates data in a range of digital formats. Recognises the difference between data	Recognises that a range of digital devices can be considered a computer (look at examples). Recognises and uses a range of input and output devices (e.g. robotics) Understands how programs specify the function of a general purpose computer. Begins to recognise that computers collect data from various input devices e.g. sensors.	Navigates the web and can carry out simple web searches to collect digital content. Demonstrates use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online. Begins to understand the difference between the internet and internet services e.g. world wide web.	Uses technology with increasing independence to purposely organise digital content. Shows awareness of the quality of digital content collected. Uses software to manipulate and present digital content: data and information. Shares their experiences of technology in school and outside school. Talks about their work

	using loops and selection (as statements). Uses logical reasoning to predict outcomes. Detects and corrects errors (debugging) in algorithms. Begins to use design solutions e.g. repetition to improve algorithms.	given goals.	and information.			and makes some improvements to solutions based on feedback received. Begins to create digital content to achieve a given goal through combining software e.g. blogs.

	Control & Algorithms	Programming and Development	Data and Representation Modelling Simulations	Hardware and Processing	Understanding Technologies *Electronic Communication* *Research* *Networks* *E-Safety*	Information Technology *Multimedia, Digital Imagery, animation, sound and music*
Year 3 Emerging	Designs some solutions (algorithms) that use repetition and two way selection (i.e if, then, else.) Uses diagrams to express solutions. Starts to use logical reasoning to predict outputs, showing some awareness of inputs.	Begins to create programs that implement algorithms to achieve given goals. Identifies and assigns variables in programs. Uses loop commands "until" and sequences of selection statements in programs, including if, then, else statements.	Understands the difference between data and information. Knows why sorting data in a 'flat file' can improve searching for information. Begins to use filters or can perform single criteria searches for information.	Begins to recognise that computers collect data from various input devices e.g. sensors and application software. Begins to understand the difference between hardware and application software and their roles within a computer system.	Understands the difference between the internet and internet services e.g. world wide web. Shows some awareness of, and can use some internet services such as VOIP. Recognises what is acceptable and unacceptable behaviour when using technologies and online services.	Collects, organises and presents data and information in digital content. Creates digital content to achieve a given goal through combining software, packages and internet services to communicate with a wider audience e.g blogging. Makes some appropriate improvements to solutions based on feedback received and can comment on the success of the solution.

Year 3 Expected	Designs solutions (algorithms) that use a short sequence of instructions including repetition and two way selection (i.e if, then, else.) Uses diagrams to express solutions. To plan ahead on and off screen. Uses logical reasoning to predict outputs, showing some awareness of inputs.	Create programs that implement algorithms to achieve given goals. Identifies and assigns variables in programs. Uses loop commands "until" and sequences of selection statements in programs, including if, then, else statements.	Understands and can explain the difference between data and information. Knows why sorting data in a 'flat file' can improve searching for information. Use a database to enter and save information. Follow straight forward lines of enquiry to search their own data. Uses filters or can perform single criteria searches for information. Use models and simulations to discover thigs and solve problems. Understand that simulations are useful in widening experiences beyond the classroom. Make use of a simple spreadsheet to store data and produce graphs. Use a data logger with support to sense physical data (sound,	Recognise that computers collect data from various input devices e.g. sensors and application software. Understand the difference between hardware and application software and their roles within a computer system.	Understands the difference between the internet and internet services e.g. world wide web. Shows awareness of, and can use some internet services such as VOIP. Beginning to show discernment in their use of computing devices and tools for a purpose and explain why the choices were made. Understand the need to abide by school and wider e-safety rules. Recognises what is acceptable and unacceptable behaviour when using technologies and online services. Understands that passwords are a key to accessing a personalised set or resources and files. Understand that passwords are critical in everyday use (banking, emails).	Confidently collects, organises and presents data and information in digital content. Creates digital content to achieve a given goal through combining software, packages and internet services to communicate with a wider audience e.g blogging. Record and present information integrating a range of appropriate media text, graphics, sound, video and hyperlinks. Manipulate digital images using a wide range of tools to covey a specific mood, style or idea. Create a simple podcast selecting and importing existing music and sound effects as well as their own recordings. Makes effective improvements to solutions based on feedback received and

			light, temperature)		Ask own questions linked to the curriculum study and use ICT sources to find answers (search engines, index, menu, hyperlinks)	can comment on the success of the solution.
Year 3 Exceeding	Designs solutions (algorithms) that use repetition and two way selection (i.e if, then, else.) Uses diagrams to express solutions. Uses logical reasoning to predict outputs, showing some awareness of inputs. Begins to show an awareness of tasks best completed by humans or computers.	Create programs that implement algorithms to achieve given goals. Identifies and assigns variables in programs. Uses loop commands "until" and sequences of selection statements in programs, including if, then, else statements. Begins to understand the difference between 'if' and 'if', then and else statements.	Understands and can clearly explain the difference between data and information. Knows why sorting data in a 'flat file' can improve searching for information. Uses filters and can perform single criteria searches for information. Starts to perform more complex searches for information e.g. relational operators.	Recognise that computers collect data from various input devices e.g. sensors and application software. Understand the difference between hardware and application software and their roles within a computer system. Begins to understand why and when computers are used.	Understands the difference between the internet and internet services e.g. world wide web. Shows awareness of, and can use some internet services such as VOIP. Recognises what is acceptable and unacceptable behaviour when using technologies and online services. Produces safety guidance on viruses, cyber bullying and stranger danger. Demonstrate an understanding or URLs.	Collects, organises and presents data and information in digital content. Creates digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience e.g blogging. Makes effective improvements to solutions based on feedback received and can comment on the success of the solution. Makes judgements about the effectiveness and suitability of the digital content for the targeted audience.

Year 4 Emerging	Shows an awareness of tasks best completed by human or computers. Begins to design solutions by decomposing a problem. Begins to recognise that there is more than one solution to a problem.	Begin to understand differences between 'if' and 'if', then and else statements. Uses some variable and relational operators within a loop to control 'endings' in programs. Designs, writes and debugs (modular) programs using procedures (algorithms). Begins to know that a procedure can be used to hide details in programs.	Understands and can clearly explain the difference between data and information. Knows why sorting data in a 'flat file' can improve searching for information. Uses filters and can perform single criteria searches for information. Starts to perform more complex searches for information e.g. relational operators. Begins to analyse and evaluate data and information and recognises that poor quality data leads to unreliable results.	Begins to understand why and when computers are used. Understands the main functions of the operating systems. Begins to know the difference between physical, wireless and mobile networks. Look at examples e.g. internet: how they provide multiple services such as the world wide web.	Understands how to effectively use search engines and knows how search results are selecting including that search engines are 'web crawler programs' Selects, combines and uses some internet services. Demonstrates responsible use of technologies and online services and knows how to report concerns.	Begins to make judgements about digital content when evaluating and assigning it for a given audience. Recognises the audience when designing and creating digital content. Understands the potential of information technology for collaboration when computers are networked. Uses criteria to evaluate the quality of solutions.
Year 4 Expected	Knows which tasks best completed by human or computers. Engage in logo based problem solving activities that require the need to write procedures, predict, test and modify.	Use control software to control devices using output commands or on screen. Predict, test and refine programming. Understands differences between and appropriately uses	Work as part of a class/group project to create a data collection sheet and use it to create a simple database to answer questions. Interrogate a database by searching, sorting	Understands why and when computers are used. Understands the main functions of the operating systems. Knows the difference between physical, wireless and mobile	Perform internet searches using different search engines and check the results against each other explaining why they may be different. Show an awareness of the need for accuracy	Makes judgements about digital content when evaluating and assigning it for a given audience. Recognises the audience when designing and creating digital content. Use advanced tools in

	Designs solutions by decomposing a problem and creates a sub-solution for each part of the problem (decomposition) Recognises that there is more than one solution to a problem.	'if' and 'if', then and else statements. Uses variable and relational operators within a loop to control 'endings' in programs. Designs, writes and debugs (modular) programs using procedures (algorithms). Knows that a procedure can be used to hide details in programs.	and graphing. Understands and can clearly explain the difference between data and information. Knows why sorting data in a 'flat file' can improve searching for information. Performs more complex searches for information e.g. using Booleam and relational operators. Analyses and evaluates data and information and recognises that poor quality data leads to unreliable results and inaccurate conclusions. Create a spreadsheet model to explore patterns and relationships. Make predictions and enter simple formulae in the process. Use a data logger confidently, connected to the computer or remotely to capture	networks. Look at examples e.g. internet: how they provide multiple services such as the world wide web.	in spelling and syntax to search effectively. Understands how to effectively use search engines and knows how search results are selecting including that search engines are 'web crawler programs' Selects, combines and uses internet services. Share work created electronically by email. VLE or uploading to publishing websites. Respond to feedback given electronically. Demonstrates responsible use of technologies and online services and knows a range of ways to report concerns both within school and the wider community. Understand copyright regulations when using copy and paste to reproduce information for a particular audience. Question the accuracy	word processing software such as tabs, text formatting, line and paragraph spacing to create quality presentations for a known audience. Make a short film / animation suing still and moving images they have sources / captured or created. Create mutilpe track compositions that contain a variety of sounds. Understands the potential of information technology for collaboration when computers are networked. Uses criteria to evaluate the quality of solutions. Can identify improvements, making some refinements to the solution and future solutions.

			continuous or intermittent data readings. Interpret the results and use the data in their own investigations. Identify the advantages us using ICT to capture data that might be otherwise problematic.		and validity of information available via the internet. Demonstrate an understanding of the school network and how it links computers to resources in school and beyond. Compare the school network to those in the wider world e.g. Banks Make choices about the devices and tools used for specific purposes.	
Year 4 Exceeding	Knows which tasks are best completed by human or computers, giving examples. Designs solutions by decomposing a problem and creates a sub-solution for each part of the problem (decomposition). Recognises that there are several solutions to the same problem and various algorithms exist for different purposes.	Understands differences between and appropriately uses 'if' and 'if', then and else statements. Uses variable and relational operators within a loop to control 'endings' in programs. Designs, writes and debugs (modular) programs using procedures (algorithms). Knows that a procedure	Clearly explain the difference between data and information, giving examples. Knows why sorting data in a 'flat file' can improve searching for information. Performs more complex searches for information e.g. using Booleam and relational operators. Analyses and evaluates data and information	Understands why and when computers are used. Understands the main functions of the operating systems. Knows the difference between physical, wireless and mobile networks. Look at examples e.g. internet: how they provide multiple services such as the world wide web. Begins to recognise the	Understands how to effectively use search engines and knows how search results are selecting including that search engines are 'web crawler programs' Selects, combines and uses internet services. Demonstrates responsible use of technologies and online services and knows a range of ways to report concerns.	Makes sound judgements about digital content when evaluating and assigning it for a given audience. Recognises the audience when designing and creating digital content. Understands the potential of information technology for collaboration when computers are networked. Uses criteria to

		can be used to hide details in programs. Begins to recognise that programming bridges the gap between algorithms and computers.	and recognises that poor quality data leads to unreliable results and inaccurate conclusions. Starts to understand key vocabulary e.g. binary and bit patterns.	function of the main internal parts of basic computer designs (architecture.)	Begins to understand how search engines rank results.	evaluate the quality of solutions. Can confidently identify improvements, making some refinements to the solution and future solutions.

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Year 5 Emerging	Knows which tasks best completed by human or computers. Engage in logo based problem solving activities that require the need to write procedures, predict, test and modify. Knows which tasks are best completed by human or computers. Designs solutions by decomposing a problem and creates a sub-solution for each part of the problem (decomposition). Recognises that there are several solutions to the same problem. Understands that various algorithms exist for different functions.	Begins to recognise that programming bridges the gap between algorithms and computers. Has some practical experience of high level textural languages e.g. standard libraries when programming. Uses some operators and expressions e.g. Booleam.	Knows why sorting data in a 'flat file' can improve searching for information. Performs more complex searches for information e.g. using Booleam and relational operators. Analyses and evaluates data and information and recognises that poor quality data leads to unreliable results and inaccurate conclusions. Starts to understand key vocabulary e.g. binary and bit patterns. Begins to understand that digital computers are binary to represent all data.	Understands why and when computers are used. Understands the main functions of the operating system. Knows the difference between physical, wireless and mobile networks. Look at examples e.g. internet: how they provide multiple services such as the world wide web. Recognise the function of the main internal parts of basic computer designs (architecture.)	Begins to understand how search engines rank search results. Understands how to construct static web pages using HTML and CSS. Begins to understand data transmission between digital computers over networks including the internet i.e. IP addresses and packet switching.	Makes sound judgements about digital content when evaluating and assigning it for a given audience. Recognises the audience when designing and creating digital content, (makes examples and tests them). Understands the potential of information technology for collaboration when computers are networked. Uses criteria to evaluate the quality of solutions. Confidently identify improvements, making some refinements to the solution and future solutions.

Year 5 Expected	Knows and can explain which tasks are best completed by human or computers. Designs solutions by decomposing a problem and creates a sub-solution for each part of the problem (decomposition). Recognises that there are several solutions to the same problem. Understands that various algorithms exist for different functions. Begins to identify patterns in algorithms that help to solve specific problems.	Use control software to control devices using output commands or on screen. Predict, test and refine programming. Understands that programming bridges the gap between algorithmic solutions and computers. Has practical experience of high level textural languages e.g. standard libraries when programming. Uses some operators and expressions e.g. Booleam. Starts to apply these in the context of program control (e.g. input/process/output.)	Work as part of a class/group project to create a data collection sheet and use it to create a simple database to answer questions. Knows why sorting data in a 'flat file' can improve searching for information. Interrogate a database by searching, sorting and graphing. Performs more complex searches for information e.g. using Booleam and relational operators. Analyses and evaluates data and information and recognises that poor quality data leads to unreliable results and inaccurate conclusions. Begins to understand that digital computers are binary to represent all data. Begins to understand how bit patterns	Recognise the function of the main internal parts of basic computer designs (architecture.) Begins to understand the concept behind the fetch-execute cycle. Starts to appreciate that there is a range of operating systems and application software for the same hardware.	Perform internet searches using different search engines and check the results against each other explaining why they may be different. Show an awareness of the need for accuracy in spelling and syntax to search effectively. Understands how search engines rank search results and test some of these systems. Understands how to construct static web pages using HTML and CSS. Understands data transmission between digital computers over networks including the internet i.e. IP addresses Demonstrate an understanding of the school network and how it links computers to resources in school and beyond. Compare the school	Evaluates the appropriateness of digital services, internet services and application software to achieve given goals. Recognises ethical issues surrounding the application of information technology beyond school. Designs criteria to critically evaluate the quality of solutions. Uses the criteria to identify improvements, and can make appropriate some refinements to the solution. Use advanced tools in word processing software such as tabs, text formatting, line and paragraph spacing to create quality presentations for a known audience. Make a short film / animation suing still and moving images they have sources / captured

			represent numbers and images. Create a spreadsheet model to explore patterns and relationships. Make predictions and enter simple formulae in the process. Use a data logger confidently, connected to the computer or remotely to capture continuous or intermittent data readings. Interpret the results and use the data in their own investigations. Identify the advantages us using ICT to capture data that might be otherwise problematic.		network to those in the wider world e.g. Banks Make choices about the devices and tools used for specific purposes. Share work created electronically by email. VLE or uploading to publishing websites. Respond to feedback given electronically. Demonstrates responsible use of technologies and online services and knows a range of ways to report concerns both within school and the wider community. Understand copyright regulations when using copy and paste to reproduce information for a particular audience. Question the accuracy and validity of information available via the internet.	or created. Create multiple track compositions that contain a variety of sounds.

Year 5 Exceeding	Explains confidently which tasks are best completed by human or computers. Designs solutions by decomposing a problem and creates a sub-solution for each part of the problem (decomposition). Recognises that there are several solutions to the same problem. Understands that various algorithms exist for different functions. Identifies patterns in algorithms that help to solve specific problems.	Understands that programming bridges the gap between algorithmic solutions and computers. Has practical experience of high level textural languages e.g. standard libraries when programming. Uses a range of operators and expressions e.g. Booleam. Starts to apply these in the context of program control (e.g. input/process/output.)	Knows why sorting data in a 'flat file' can improve searching for information. Performs more complex searches for information e.g. using Booleam and relational operators. Analyses and evaluates data and information and recognises that poor quality data leads to unreliable results and inaccurate conclusions. Knows that digital computers use binary to represent all data. Understands how bit patterns represent numbers and images.	Recognises and understands the function of the main internal parts of basic computer designs (architecture.) Understands the concepts behind the fetch-execute cycle. Starts to appreciate that there is a range of operating systems and application software for the same hardware.	Understands how search engines rank search results and test and evaluate some of these systems. Understands how to construct static web pages using HTML and CSS. Understands data transmission between digital computers over networks including the internet i.e. IP addresses and packet switching.	Evaluates the appropriateness of digital services, internet services and application software to achieve given goals. Recognises ethical issues surrounding the application of information technology beyond school. Designs criteria to critically evaluate the quality of solutions. Uses the criteria to identify effective improvements, and can make appropriate some refinements to the solution.

Year 6 Emerging	Begins to understand that iteration is the repetition of a process such as a loop. Recognises that different algorithms exist for the same problem. Detects errors in algorithms. Rewrites own tests and sequences. Is able to identify some similarities and differences in situations and can use these to solve problems (pattern recognition.)	Understands that programming bridges the gap between algorithmic solutions and computers. Has practical experience of high level textural languages e.g. standard libraries when programming. Uses a range of operators and expressions e.g. Booleam. Starts to apply these in the context of program control (e.g. input/process/output.) Starts to select the appropriate data types.	Knows that digital computers use binary to represent all data. Understands how bit patterns represent numbers and images. Begins to know that computers transfer data in binary (code). Starts to recognise the relationship between binary and file size (uncompressed) Defines data types: real numbers and booleam. Queries data on one table using typical query language.	Recognises and understands the function of the main internal parts of basic computer designs (architecture.) Understands the concepts behind the fetch-execute cycle. Knows that there is a range of operating systems and application software for the same hardware. Tests, compares and contrasts the effectiveness of operating systems (eg. Windows android)	Understands how search engines rank search results and test and evaluate some of these systems. Understands how to construct static web pages using HTML and CSS. Understands data transmission between digital computers over networks including the internet i.e. IP addresses and packet switching. Begins to know the names of hardware e.g hubs and routers.	Begins to justify the choice of, combines and uses multiple digital devices, internet services and application software to achieve given goals. Starts to evaluate the trustworthiness of digital content. Begins to consider how the use of technology can impact on society.
Year 6 Expected	Cretae sequences of commands to control devices in response to sensing inputs as well as outputs. Understand that iteration is the repetition of a process such as a loop. Recognises that different algorithms exist for the same	Understands that programming bridges the gap between algorithmic solutions and computers. Has practical experience of high level textural languages e.g. standard libraries when programming. Uses a range of operators and expressions e.g. Booleam	Knows that digital computers use binary to represent all data. Understands how bit patterns represent numbers and images. Knows that computers transfer data in binary (code). Recognises the relationship between binary and file size	Abide by school and wider community rules for e-safety. Recognises and understands the function of the main internal parts of basic computer designs (architecture.) Understands the concepts behind the fetch-execute cycle. Knows that there is a	Understands how search engines rank search results. Clearly evaluates these systems. Understands how to construct static web pages using HTML and CSS. Designs and creates own web pages for a purpose. Understands data	Justifies the choice of, combines and uses multiple digital devices, internet services and application software to achieve given goals. Multimedia work demonstrates restrained use of effects that convey meaning rather than used to impress. Evaluates the

	problem. Detects errors in algorithms. Rewrites and tests own tests and sequences ensuring that it is fit for purpose. Is able to identify similarities and differences in situations and can use these to solve problems (pattern recognition.)	and applies them in the context of program control (e.g. input/process/output.) Starts to select the appropriate data types.	(uncompressed) Queries data on one table using typical query language. Solve a problem by planning and carrying out data collection, organising and analysing data involving complex searches using a database to draw conclusions and present findings. Demonstrate a need for accuracy by spotting implausible data. Understand the need for data protection and the need for data security in the wider world (health, police, criminal, banking databases) Set up and use own spreadsheets that contains formulae to investigate what if questions and when changing variables. Relate their use of spreadsheets to model situations in the wider world. Independently identify their own opportunities	range of operating systems and application software for the same hardware. Tests, contrasts and evaluates the effectiveness of operating systems (eg. Windows android) Independently and with due regard for safety, search the internet using a variety of techniques to fins a wide range of information and resources. Use appropriate methods to validate information and check for bias and accuracy. Repurpose and make appropriate use of selected resources for a given audience acknowledging material used.	transmission between digital computers over networks including the internet i.e. IP addresses and packet switching. Use collaborative tools and email showing a sensitivity for this type of remote collaboration and communication. Demonstrate an awareness of how filtering and monitoring tools affect their use of the school network and internet and compare this with access outside of school.	trustworthiness of digital content. Knows how the use of technology can impact on society. Use images sourced / captured / manipulated as part of a bigger project. Create and share more sophisticated podcast and consider the effect the podcast will have on the audience. Begins to design criteria for users to evaluate the quality of solutions and uses the feedback to identify some improvements.

			for data logging when carrying out experiments. Able to check and question results by spotting trends in data and identify where problems may have occurred.			
Year 6 Exceeding	Understands that iteration is the repetition of a process such as a loop. Recognises that different algorithms exist for the same problem. Detects errors in algorithms. Rewrites and tests own sequences. Is able to identify similarities and differences in situations and can use these to solve problems (pattern recognition.) Begins to recognise that some problems share the same characteristics and use the same algorithms to solve both (generalisation)	Understands that programming bridges the gap between algorithmic solutions and computers. Has practical experience of high level textural languages e.g. standard libraries when programming. Uses a range of operators and expressions e.g. Booleam and applies them in the context of program control (e.g. input/process/output.) Starts to select the appropriate data types. Starts to appreciate the need for and writes their own "custom" functions to improve programs. Starts to detect and correct syntactical errors.	Knows that digital computers use binary to represent all data. Understands how bit patterns represent numbers and images. Knows that computers transfer data in binary (code). Recognises the relationship between binary and file size (uncompressed) Defines data types: real numbers and Booleam. Queries data on one table using typical query language. Begins to understand how numbers, images, sounds and character sets use the same bit patterns.	Recognises and understands the function of the main internal parts of basic computer designs (architecture.) Understands the concepts behind the fetch-execute cycle. Tests, contrasts and evaluates a range of operating systems and application software that is often used for the same hardware. Begins to understand the Von Neuman architecture in relation to the fetch-execute cycle, including how data is stored in memory. Understand the basic function and operation of location addressable memory.	Understands how search engines rank search results. Clearly evaluates these systems. Understands how to construct static web pages using HTML and CSS. Designs and creates own web pages for a purpose. Understands data transmission between digital computers over networks including the internet i.e. IP addresses and packet switching. Knows key names of hardware e.g. hubs, routers, switches and the names of protocols e.g.SMTP, IMAP, POP, FTP, TCP/IP associated with computer systems.	Justifies the choice of, and independently combines and uses multiple digital devices, internet services and application software to achieve given goals. Evaluates the trustworthiness of digital content and considers the usability of visual design features when designing and creating digital artefacts for a known audience. Identifies and explains how the use of technology can impact on society. Designs criteria for users to evaluate the quality of solutions and uses the feedback to identify some improvements and can make appropriate refinements to the solution.