Community Respect Perseverance

Let Your Light Shine

Meole Brace
C of E Primary School and Nursery

Computing Subject Handbook

Our vision and rationale for Computing

The use of technology is an integral part of our curriculum and provides pupils with the technological and communication skills they will need to live in our modern world.

Our computing curriculum allows our children to develop our three core values of ***perseverance, respect*** and ***community***.

The Computer Science strand teaches children to try new ideas and concepts through programming. Children become resilient as they create and test algorithms. They debug their own code if it hasn't worked immediately and develop a sense of ***perseverance*** to reach an end goal.

The Digital Literacy strand focuses on the value of technology. We believe that in order to use technology at its best, we need to equip pupils with the skills to evaluate its use. Pupils need to understand and ***respect*** the positive and negative impact technology has on our society, for them to make clear, confident choices about how they use it in their everyday lives. The strong E-Safety element of this strand provides pupils with the knowledge of how to keep safe when using the internet, allowing them to be successful members of a digitally literate ***community.***

The Information Technology strand develops pupils' awareness of the use of technology in daily life. They select and use a variety of software on a range of devices to design and create content promoting a sense of ***perseverance***. Pupils are informed of the nature of copyright and the importance of ***respecting*** others' work online.

Our computing curriculum develops lifelong transferable skills through promoting curiosity, confidence and creativity whilst inspiring challenges.

Curriculum Subject Leader

Miss Sian Owens

National Curriculum Progression for Computing

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computer Science (Teach Computing)	Pupils should be taught to: • 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.			Pupils should be taught to: • 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.		

Computing Progression of knowledge

		Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Concepts and Themes	Computer science, Digital literacy and Information Technology							

Computer Science (Teach Computing)	**Core Knowledge**	I know that a command is an instruction. I know that pressing buttons on a toy will result in an action.	I know that a computer program turns an algorithm into a code that the computer can understand I know that correcting errors in a program or algorithm is called debugging. I know that the programable character is called a sprite. I know how to explain what a given command will do.	I know how to describe a series of instructions as a sequence I know that instructions need to be clear and specific I know that an algorithm is a precise set of ordered instructions which can be turned into code I know that a prediction is a reasoned decision rather than a guess I know how to design an algorithm I know how to debug by breaking down a task into smaller chunks I know that an outcome can be the same	I know the objects in a Scratch project (sprites, backdrops) I know how to explain that objects in Scratch have attributes (linked to) I know that commands in Scratch are represented as blocks I know that each sprite is controlled by the commands I choose I know how to explore a new programming environment I know how to recognise that a sequence of commands can have an order I know what a sequence is I know how to change the	I know how to explain the effect of a changing value of a command. I know how to identify the effect of changing the number of times a task is repeated I know how to predict the outcome of a program containing a count controlled loop I know that a computer can repeatedly call a procedure I know when to use a count controlled loop I know I can modify loops to produce a given outcome	I know what condition means I know what selection means I know what an infinite loop is I know what an algorithm is I know what a micro-controller is I know what input and output are I know what a sequence is I know how to program a micro-controller using an algorithm I know that conditions being met can start an action I know how to identify a condition to	I know examples of information that is variable I know the way a variable can change and can be defined I know that a variable has a name and a value I know how to create algorithms for my project I know what sequence, repetition, selection, variables and Programming mean from my previous learning. I know the micro:bit is an input, process, output device that can be programmed.

				but be created differently. I know how to create an algorithm linked to a given design. I know how to improve my project.	appearance of my project I know how to create a project from a task description I know how to explain how a sprite moves in an existing project I know how to create a program to move a sprite in four directions I know how to adapt a program to a new context I know how to develop my program by adding features I know how to identify and fix bugs in a program I know when to design and create a challenge	I know that some programming languages help more than one procedure run at once. I know what the outcome of a repeated action should be. I know how to evaluate the steps I followed when building my project.	start an action (real world)	I know how to test my program on an emulator I know how to transfer my program to a controllable device I know there are conditions in the real world I know checking a variable doesn't change its value I know modifying a program allows me to achieve a different outcome.

					I know that the objects in my project will respond exactly to the code			
	Skills		I can follow a command with up to 4 directions. I can write a simple algorithm I can try and fix my code if it isn't working correctly I can make reliable predictions of what is going to happen when we change the value I can follow an instruction I can choose a sequence of commands for a given purpose	I can explain what happens when we change the order of instructions I can reason to predict the outcome of a program (series of commands) I can choose a series of words that can be enacted as a sequence I can match two sequences with the same outcome. I can decide which blocks to use to meet the design. I can test the mat/route I have created using art	I can choose a word which describes an on-screen action for my design I can create a program following a design I can start a program in different ways I can create a sequence of connected commands I can combine sound commands I can order notes into a sequence I can build a sequence of commands I can decide the actions for	I can create a code snippet for a given purpose I can program a computer using commands I can test my algorithm I can use a template to create a design for my program I can write an algorithm to produce a given outcome I can identify everyday tasks that include repetition as part of a sequence,	I can identify conditions in a program I can modify conditions in a program I can use selection in an infinite loop I can identify the condition and outcome in an 'if…then… else' statement I can create a program with different outcomes using selection I can use selection in an infinite loop to check a condition	I can identify that variables can hold numbers or letters I can identify a program variable as a placeholder in memory for a single value I can recognise the value of a variable can be changed I can decide where in a program to change a variable I can make use of an event in a program to set a variable I can recognise a value, or a variable can be used by a program.

				I can create an algorithm to achieve a specific goal. I can test and debug a program	each sprite in a program I can make design choices for my artwork I can identify and name the objects I will need for a project I can relate a task description to a design I can implement my algorithm as code	E.g brushing teeth I can identify patterns in a sequence I can use a count controlled loop to produce an outcome I can chose which values change in a loop I can identify chunks of actions in the real world I can produce a program I can debug my program I can list an everyday task as a set of instructions including repetition I can predict the outcome	I can create a program with different outcomes using selection I can use a design format to outline a project I can identify the outcome of user input in an algorithm I can implement, test and share my programs I can evaluate and debug my program algorithms I can build a simple circuit to connect a micro-controller to a computer I can program a micro-controller to light an LED I can use an infinite loop	I can choose and create the artwork for my project I can explain my design choices I choose a name that identifies the role of a variable I can test the code that I have written I can identify ways that my game can be improved I can use variables to extend my game I can share my game with others. I can use a variable in an if, then, else statement to select the flow of a program

						of a snippet code I can modify a snippet code to create a given outcome	I can connect multiple devices to a micro-controller I can design sequences for output devices I can explain that a condition is true or false I can experiment 'do until loop'. I can identify conditions and actions in my project I can use selection to direct the flow of a program I can describe what my project will do I can create a detailed drawing of my project I can write algorithms to	I can determine the flow of a program using selection can use a condition to change a variable I can experiment with different physical inputs I can use an operand (e.g. <>=) in an if, then statement I can explain the importance of the order of conditions in else, if statements I can decide what variables to include in a project I can design the algorithm for my project I can design the program flow for my project

							control lights and a motor I can use selection to produce an intended outcome I can test and debug my project.	I can create a program based on my design I can test my program against my design I can use a range of approaches to find and fix bugs
	Vocabulary	Button On Off Computer Bee-Bot	Debugging Sprite Command Algorithm Program Code Value Direction Device (Forward, Backwards, left, right)	Instruction Program Code Sequence Clear Code tracing Algorithm Order Command Mats Routes Debugging outcome	Program Code Sequence Order Algorithm Debugging Attributes Appearance Command Sprite Backdrop	Command Algorithm Program Repetition Sequence Loop Debugging Sprite Evaluate Infinite loop Count-controlled	Conditions Selection Program Infinite loop Statement Design format User input Algorithm Circuit Micro-controller LED Connect Sequences Count controlled loop 'do until loop' Intended outcome debug	Algorithm Variable Device Program Project Design Flow Placeholder Single program Bugs Microbit Programmable device sequence, repetition, selection, variables Programming
Digital Literacy	**Core Knowledge**		I know that information can come from different sources.	I know the different forms of information (text, images, sound)	I know the role of a search	To know that a hyperlink can take you	I know the names of	I know that the internet is one of many ways

			I know that we can access information quickly on the internet. I know that the internet can be used at home and in school/work I know that information can be personal. I know that anyone can access the internet. I know that I should not share personal information. I know examples of unkind behaviour online. I know what to do if I was ever feeling worried about something online.	and understand some are more useful than others I know information can be used to answer specific questions I know and understand how digital technology supports our lives at home or school. I know that anyone can access the internet. I know that personal information should not be shared online I know some online sites and games are age-appropriate I know what to do if I am worried online.	engine. I know that 'autocomplete' is a tool used by a search engine. I know not all online images should be used and what someone should do if one is used. I know what copyright is. I know how to communicate with others online I know that anyone can access the internet so personal information should not be shared and what to do if I am worried about something online. I know networks offer opportunities	directly to the world wide web To know that information is not always reliable To understand that key words can help search safely on the internet To know that not all online images should be used	different parts of the internet. I know what the different parts of a webpage are called. I know how the internet is used to communicate I know that not all online images are suitable I know that webpages are created by people I know how to keep myself safe online I know the protocol of communicating online I know how to identify age-appropriate material I know what a virus is	to find out information or communicate. I know how to stay safe online. I know the value of protecting my privacy and others online. I know dangers and risks I should look out for when online. I know that PEGI symbols tell me the age appropriateness of a site/game. I know that there are negative consequences for not being safe online.

					for communication and collaboration I know how to be safe online. I know that some activities or games online are not appropriate for everyone. I know how age restrictions are decided. I know how to discuss why some online activities have age restrictions.		I know what to do if I see inappropriate content. I know a range of useful ways for which technology can be used I know the risks of sharing information online	
	Skills		I can identify different sources of information books, web sites, TV etc. I can explore a variety of electronic information as	I can identify different forms of information (text, images, sound I can explain how to be safe online.	I can recognise search tools to find and use appropriate website I can recognise risks online.	I can recognise resources from the internet, the school network or personal device. I can use appropriate	I can evaluate different types of information found on the world wide web I can find useful and reliable websites.	I can demonstrate safe and respectful use of a range of different technologies and online services

			part of a given topic. . I can identify things I should/shouldn't share online I can explain what to do if I am worried online.	I can identify safe and unsafe personal information that could be shared. I can explain consequences of sharing personal information.	I can use the internet and devices safely. I can identify different age restrictions on a range of devices and games. I can identify risks of communicating online.	tools to collaborate online To use various sources to find information and consider reliability I can idenfity some common uses of technology outside of school I can use technology safely and respectfully considering other peoples feelings. I can identify personal information that should be kept private I can ask for help if I am worried when using a computer		I can identify risks and viruses online. I can identify more discrete inappropriate behaviours online. For example, someone who may be trying to groom me or someone else. I can use critical thinking to help me stay safe online.

						I can recognise age appropriate symbols I can follow the 'think then click' agreement.		
	Vocabulary		Devices Online Online safety Being safey E-safety Information Personal	Online safety E safety Social media Strangers Website WWW Information Personal Risk danger	Communication Risk Online safety PEGI Content Public Search engine Auto-complete Copy right E safety Social media Strangers	Hyperlink WWW Search Keywords Online Personal information Age-appropriate Network device	URL Search bar Author Webpage Content Search engine PEGI Etique Virus E-Safety Posting Sharing Reliability Technology Collaboration	E safety Online Devices Consequence Personal Content Virus Posting Sharing Social media Responsibility Peer pressure Online bullying Digital footprint safety
Information Technology (Teach Computing)	**Core Knowledge**		I know how to use tools to make marks and draw lines. I know what an object is. I know that objects can be counted.	I know that music can make you feel a range of emotions. I know that rhythm is a pattern of sounds of different lengths.	I know how to explain the difference between text and images I know text and images can communicate messages clearly	I know how to choose a data set to answer a given question. I know that data is collected over time.	I know what fields, data and records are. I know which fields to use to sort data to answer a question. I know that a vector drawing	I know how to complete a web search to find specific information I know how to use a search engine I know what a web crawler is.

			I know how to sort different objects by comparing them. I know that objects can be described differently. I know I can write and draw on a computer or paper. I know how to add and remove text on a computer. I know how to change the look of text.	I know that music is made from a series of notes I know that a tally chart is an effective way of organising data. I know that an attribute is a property of an object I know that I can present information using a computer. I know that some information should not be shared I know which devices take photographs I know how to improve a photograph I know I can edit a photograph	I know text can be edited I know the page orientations portrait and landscape I know I need to save my work in an appropriate place I know how to choose a identify different layout for given purpose I know what animation is and how an animation flip book works. I know why little changes are needed for each frame. I know what onion skinning is and can use it to help me make small	I know that sensors are input devices I know how to identify that data from sensors can recorded I know how to interpret data that has been collected using a data logger I know that a computer program sorts data I know how to use a computer to view data in different ways I know how to explain the effect editing can have on an image I know that changes can	is made of shapes. I know that each element of a vector drawing is an object. I know how to move, resize rotate and supplicate objects. I know how to use zoom tool. I know how to use alinement grids and resize handles. I know how to modify objects to create effects. I know how to change the order of layers. I know that video contains visual and audio media. I know the benefits of	I know that search results are ordered in rank. I know what I should and should not share online. I know that communication online may not be private. I know how to use a website I know the websites are written in HTML I know the common features of a webpage I know why I should use copyright free images I know what navigation path is I know the implications of

					changes between frames I know what an effective animation should include. I know what a branching database is I know data is separated by different attributes. I know different objects can be arranged in a branching data base. I know a branching database must reflects my plan I know there are real-world uses for branching databases	be made to an image I know why someone might want to change the composition of an image I know the positive and negative effects that retouching can have on an image. I know how to access the WWW and the types of media on this. I know that new content can be created online and can recognise these I know there are rules to protect content	audio on a video I know how to safely use and handle devices. I know why lighting and angle is important in making an effective video I know how to store, retrieve and export my recording to a computer I know how to edit my video	linking to content owned by others I know data can collected and presented on spread sheets. I know formulas can be used to produce calculated data I know data can be presented in different suitable ways. I know data needs to be collected I know a data set must be built in a spreadsheet I know what a cell is I know what input and output means

						I know that websites are created by people I know I need to think carefully about sharing and resharing content online I know information online is not always true and why some information online is not accurate, honest or legal.		I know data can be calculated
	Skills		I can use shape and line tools to paint a picture. I can change and create using colour, brush sizes and shape. I can say whether I prefer using the computer or paper.	I can listen to a range of music I can describe how music makes me feel. I can create a rhythmical pattern. I can play an instrument following a rhythmical pattern.	I can identify the advantages and disadvantages of using text and images I can change font style, size, and colours for a given purpose I can explain that text can	I can suggest questions that can be answered using a given data set I can use data from a senor to answer a given question	I can order, sort and group data cards. I can navigate a computer data base and group into fields and records. I can use AND or a data selection. I can use multiple	I can refine my web-search I can compare results from different search engines I can recognise the role of web crawlers in creating an index I can relate a search term to

			I can answer questions about a set of objects I can describe objects using labels I can identify and label a group of objects I can find objects with similar properties I can open a word processor. I can identify and find keys on a keyboard. I can use the backspace to remove text. I can use the space key to put a space between words. I can type capital letters. I can use bold italics and underline tools. I can double click and click and	I can connect images with sound. I can use the computer to experiment with pitch and duration. I can use a computer to create musical pattern with a series of 3 notes. I can explain my choices. I can record data in a tally chart. I can represent a tally count as a total. I can enter data onto a computer I can use pictograms to answer simple questions about objects I can identify and describe objects based	be changed to communicate more clearly I can identify placeholders and say why they are important I can create a template for a particular purpose I can paste text and images to create a magazine cover I can make changes to content after I've added it I can identify the uses of desktop publishing in the real world I can say why desktop publishing might be helpful I can compare work made on desktop	I can identify a suitable place to collect data I can identify the intervals used to collect data I can talk about the data that I have captured I can import a data set I can plan how to collect data using a data logger I can propose a question that can be answered using a logged data I can draw conclusions from the data I have collected I can explain the benefits of using a data logger	criteria to answer questions about data. I can select charts to visually compare data I can explain the benefits of a using a computer to interrogate data I can identify shapes used to make a vector drawing. I can group elements to create a single object I can evaluate and suggest improvements to my vector drawings. I can plan a video project I can name digital devices that record video and sound	a search engine's index I can explain that a search engine follows rules to rank relevant pages. I can suggest some of the criteria that search engine checks to decide the order of results I can describe some of the ways search results can be influenced I can recognise some of the limitations of search engines I can explain how search engines make money I can and compare identify the different ways people communicate (in real life and online)

			drag to make careful choices. I can use ‘undo’ to remove any changes.	on their properties I can create a pictogram to arrange an object by an attribute I can use a computer program to present information in different ways I can take a digital photograph I can explain why a photograph looks better in portrait or landscape. I can edit and improve a photograph I can identify which photos are real and which have been changed.	publishing to work created by hand I can draw a sequence of pictures I can create an effective flip book–style animation I can predict what an animation will look like I can explain why little changes are needed for each frame I can create an effective stop frame animation I can break down a story into settings, characters, and events I can describe an animation that is achievable on screen	I can explore how images can be changed in real life I can change the composition of images by selecting parts of it I can explain what has changed in an edited image I can choose and explain why effects to make my image fit a scenario I can talk about the changes made to images I can choose appropriate tools to retouch an image I can identify how an image has	I can choose the most suitable device for recording a project I can record video and audio on a device. I can evaluate my video and share my opinions	I can choose methods of communication to suit particular purposes. I can discuss the different types of media used on websites I can add content and suggest media to include on my page I can draw a webpage layout to suit my purpose. I can find copyright free images I can describe what is meant by the term ‘fair use’ I can preview what my webpage looks like I can evaluate what my page looks like on different

					I can create a storyboard I can review a sequence of frames to check my work I can evaluate the quality of my animation I can explain ways to make my animation better and use this to edit my animation I can evaluate another learner's animation I can add other media to my animation and explain my reasoning I can evaluate my final film I can create a branching data base. I can investigate questions with yes/no	been retouched I can combine parts of an image to create a new image I can sort images into 'real' or 'fake and explain my choices I can talk about fake images around me I can consider the effect of adding other elements to my work I can evaluate the impact of my publication on others through feedback. I can explain how the WWW allows us to access the internet		devices and suggest/make edits I can describe why navigation paths are useful I can make multiple web pages and link them using hyperlinks I can evaluate the user experience of a website I can create a hyperlink to link to other people's work I can suggest how to structure my data I can enter data into a spreadsheet I can explain what an item of data is I can explain which data

					answers I can make up a yes/no question about a collection of objects I can create two groups of objects separated by one attribute To identify the attributes needed to collect data about an object and separate them into groups or tree structure I can test my branching database to see if it works I can compare two branching database structures I can explain that questions need to be ordered	I can describe how the is a network of networks that needs protecting I can create media which can be found on websites		types can be used in calculations I can construct a formula in a spreadsheet I can identify that changing inputs changes outputs I can calculate data using different operations I can create a formula which includes a range of cells I can apply a formula to multiple cells by duplicating it I can use a spreadsheet to answer questions I can explain why data should be organised

					carefully to split objects into similarly sized groups I can independently create questions to use in a branching database that will enable objects to be uniquely identified I can create a physical version of a branching database I can work with a partner to test my identification tool			I can produce a chart I can use a chart to show the answer to a question I can suggest when to use a table or chart
	Vocabulary		Property Object Data set 'is' and 'is not' Group More Less Most Fewest The same Word processor	Music Rhythm Rhythmical Pattern Emotions Pitch Duration Sound Notes Melody Tempo	Animation Flip book Frames Onion skinning I-movie Edit Final film Stop frame animation Storyboard	Data Data set Data logger Sensor Interval Program Interpret Editing Retouch Composition WWW	Data Field Flat file database Value Selection Vector Resize Rotate	Communication Web crawler Search engine Ranked Internet Index WWW URL Results Media Public

			Keys Keyboard Bold Italics Underline undo	Pictogram Data Tally Chart Object Attribute Block graph Digital Photography Portrait Landscape Positioning Framing Subject Dark Flash External light Filters Effect Fake real	Data Database Branching Identification tool Attributes	Media Online Reliable unreliable	Alignment Zoom tool Resize handles Layers Duplicate Object Video Audio Storyboard Record Device Software hardware Capture Lighting Angel Retrieve Store Edit evaluate	Private Browser HTML Fair use Devices Navigation Path Hyperlinks Content Data Spreadsheet Chart Information Cells Duplicate Formular

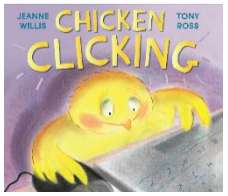
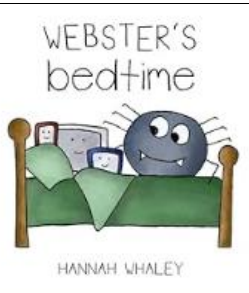
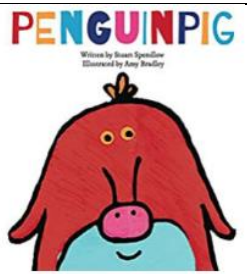
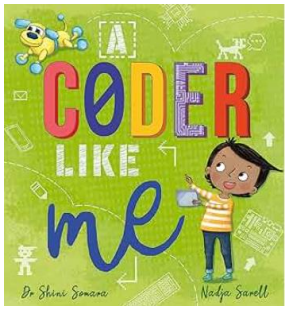
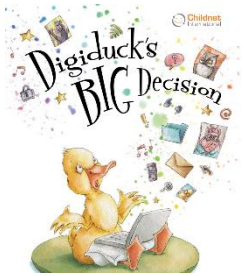
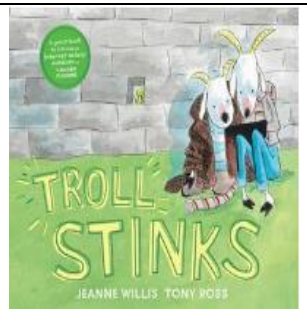
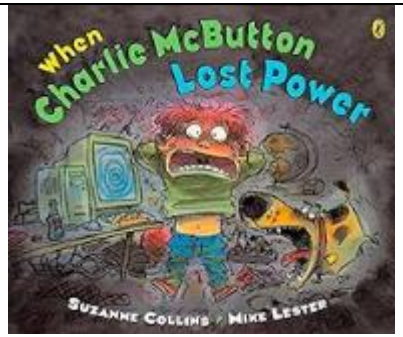
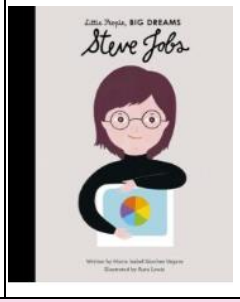
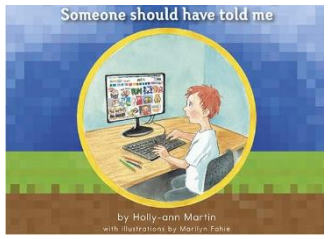
Computing Unit Coverage

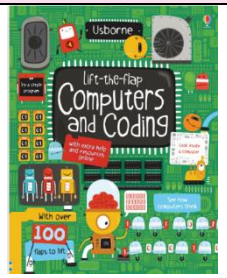
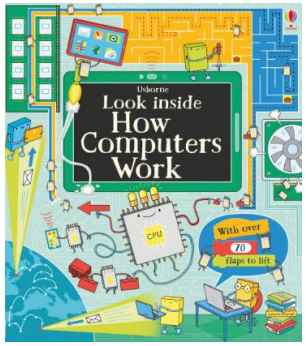
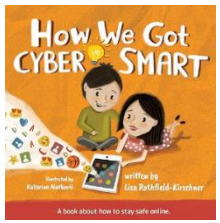
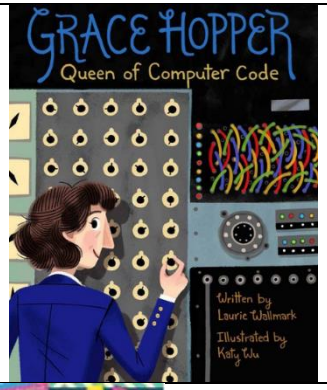
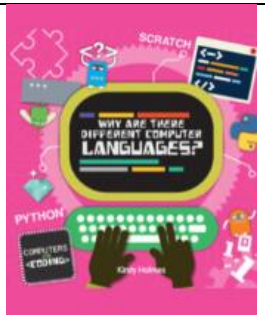
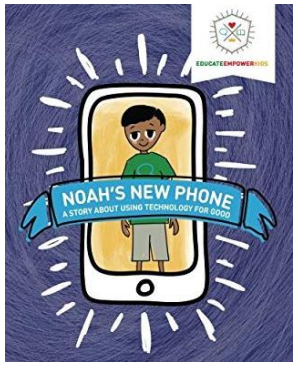
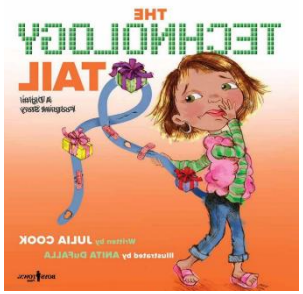
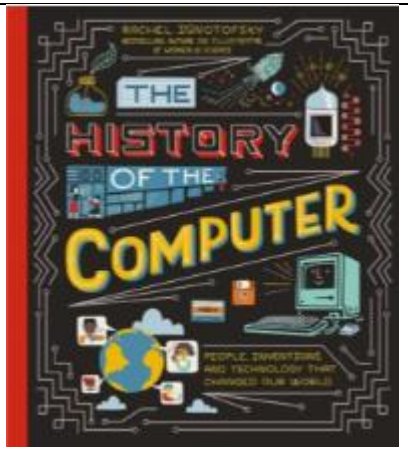
Computer Science Information Technology Digital Literacy

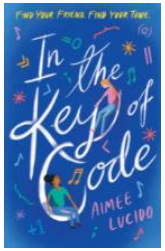
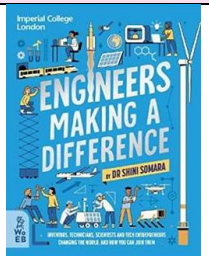
Autumn Term Spring Term Summer Term – coloured key for knowledge steps.

	Autumn Term	Spring Term	Summer Term
Year R			
Year 1	Moving Robots Digital Painting	Digital Literacy Grouping Data	Programming Animations Digital Writing
Year 2	Robots Making Music	Digital Literacy Grouping Data	Introduction to Quizzes Digital Photography
Year 3	Desktop Publishing Sequence in Music	Digital Literacy Animation	Events and Actions Data and Information
Year 4	Computing Systems and Networks Repetition in Shapes	Digital Literacy Repetition in Games	Photo Editing Data and Information
Year 5	Databases Selection in Quizzes	Digital Literacy Vector Drawing	Selection in Computing Video Editing
Year 6	Computing Systems and Networks/Communication Webpage Creation	Digital Literacy Spreadsheets	Introducing Variables Sensing

Curriculum Reading

	Autumn Term	Spring Term	Summer Term
EYFS	 		
Year 1	 		
Year 2		 	

Year 3	 		
Year 4			
Year 5		 	

Year 6	 ANT CLANCY GAMES DETECTIVE Ruth Morgan	 USBORNE STAYING SAFE ONLINE	 In the Key of Code AIMEE LUCIDO	 Imperial College London ENGINEERS MAKING A DIFFERENCE DR SHINI SOMARA