

Computing

Non-Negotiable Concepts, Key Skills, Subject Knowledge and Vocabulary

National Curriculum Statement:

Key stage 1 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.

Key stage 2 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.

Key Concepts

A- Computer Science – *Children can apply knowledge of coding and programming to write, de-bug and evaluate algorithm*

- B- Information Technology – With growing confidence, children can input data and change variables to solve problems.**
- C- Digital Literacy – Children know how to use technology safely; know the importance of personal information and how to report inappropriate behaviour and content effectively. Children understand how the internet can aid communication, including internal and external networks, and know strategies to check the information they receive via the internet.**

Year Group	Term	Key Skills (with concept)	Subject Knowledge (with concept)	Key Vocabulary
Year 1	Autumn 1	<p>Online Safety <u>C: Digital Literacy</u> Children can:</p> <ul style="list-style-type: none"> log in to Purple Mash using their own login. Pupils have created their own avatar and understand why they are used. Pupils can add their name to a picture they created on the computer. Pupils can save work into the My Work folder in Purple Mash <p>Grouping and Sorting <u>B: Information Technology</u> Children can:</p> <ul style="list-style-type: none"> Pupils can sort sound, image and text offline using a variety of criteria. Pupils can use Purple Mash activities to sort various items online using a variety of criteria. 	<p>Online Safety <u>C: Digital Literacy</u> Children know:</p> <ul style="list-style-type: none"> they have ownership of their work online. that the My Work folder is a private saving space just for their work. <p>Grouping and Sorting <u>B: Information Technology</u> Children know:</p> <ul style="list-style-type: none"> The difference between a sound, image and text 	<p>Online Safety <u>C: Digital Literacy</u> Log in Username Password Avatar My Work Topics Log out Save Notification Tools</p> <p>Grouping and Sorting <u>B: Information Technology</u> Sort Criteria</p>
	Autumn 2	<p>Pictograms <u>B Information Technology</u> Children can:</p> <ul style="list-style-type: none"> Discuss and illustrate the transport used to travel to school. Contribute to the collection of class data. 	<p>Pictograms <u>B Information Technology</u> Children know:</p> <ul style="list-style-type: none"> Why it is useful to use a pictogram and what they are used for. How pictograms are created. 	<p>Pictograms <u>B Information Technology</u> Pictogram Data Collate</p>

		<ul style="list-style-type: none"> • Use these illustrations to create a simple pictogram. • Discuss what a pictogram shows. • Collect data and record the results. • Represent results in a pictogram. <p>Tech Outside School <u>C: Digital Literacy</u> Children can:</p> <ul style="list-style-type: none"> • Recognise when technology is used. • Record examples of when technology is used out of school. 	<p>Tech Outside School <u>C: Digital Literacy</u> Children know:</p> <ul style="list-style-type: none"> • What the term ‘technology’ means. • What types of technology are used in and out of school. 	<p>Tech Outside School <u>C: Digital Literacy</u> Technology</p>
Spring 1		<p>Lego Builders <u>A: Computer Science</u> Children can:</p> <ul style="list-style-type: none"> • follow instructions in a computer program. • explain the effect of carrying out a task with no instructions. • organise instructions for a simple recipe. 	<p>Lego Builders <u>A: Computer Science</u> Children know:</p> <ul style="list-style-type: none"> • that to achieve the effect they want when building something, they need to follow accurate instructions. • that by following the instructions correctly, they will get the correct result. • that by following the instructions correctly, they will get the correct result. • that an algorithm is a precise, step by-step set of instructions used to solve a problem or achieve an objective. • that computers need precise instructions to follow. • that an algorithm written for a computer to follow is called a program. • how the order in which the steps of a recipe are presented affects the outcome • that correcting errors in an algorithm or program is called ‘debugging’. 	<p>Lego Builders <u>A: Computer Science</u> Instruction Algorithm Computer Program debug</p>

	Spring 2	Maze Explorers <u>A: Computer Science</u> Children can: <ul style="list-style-type: none"> • use diagonal direction keys to move the characters in the right direction • use the additional direction keys to create a new algorithm. • challenge themselves by using the longer algorithm to complete challenges. • change the background images in their chosen challenge and save their new challenge. 	Maze Explorers <u>A: Computer Science</u> Children know: <ul style="list-style-type: none"> • how to use the direction keys in 2Go to move forwards, backwards, left and right. • how to add a unit of measurement to the direction in 2Go Challenge 2. • how to undo their last move. • how to move their character back to the starting point. • how to create a simple algorithm. • how to debug their algorithm 	Maze Explorers <u>A: Computer Science</u> Direction Rewind Left turn Challenge Forward Debug Arrow Backwards Instruction Undo Right turn algorithm
	Summer 1	Animated Stories <u>B: Information Technology</u> Children can: <ul style="list-style-type: none"> • use the different drawing tools to create a picture on the page. • add text to a page and change the colour, font and size of the text. • open previously saved work. • add an animation to a page. • play the pages created. • save changes and overwrite the file • Pupils can add a sound to the page. • Pupils can add voice recording to the page. • create music for a page add a background to the page. • copy and paste a page in the book • Pupils can enhance the features of an ebook by adding additional pages and animations. • Pupils can share ebooks on a class story book display board. 	Animated Stories <u>B: Information Technology</u> Children know: <ul style="list-style-type: none"> • the difference between a traditional book and an e-book. 	Animated Stories <u>B: Information Technology</u> Animation Font Sound effect e-book file display board

	<p>Summer 2</p>	<p>Coding <u>A: Computer Science</u> Children can:</p> <ul style="list-style-type: none"> • explain what coding means. • explain what a block of code is. • read through combined blocks of code • make a background using Design Mode. • add characters using Design Mode. • use the drop-down menu to change backgrounds and characters. • design a simple program and then create the program using 2Code. • write a program that controls how a character will move. • make a character move when clicked. • program a character to move given a variety of input events. • can use collision detection to make objects interact. • program a sound to play when objects collide. <p>Spreadsheets <u>B: Information Technology</u> Children can:</p> <ul style="list-style-type: none"> • navigate around a spreadsheet. • explain what rows and columns are. • save and open sheets. • enter data into cells. • open the Image toolbox and find and add clipart. • use the 'move cell' tool so that images can be dragged around the spreadsheet. • use the 'lock' tool to prevent changes to cells. • give images a value that the spreadsheet can use to count them. • add the count tool to count items. 	<p>Coding <u>A: Computer Science</u> Children know:</p> <ul style="list-style-type: none"> • What coding means. • What coding is used for. • that for the computer to make something happen, it needs to follow clear instructions. <p>Spreadsheets <u>B: Information Technology</u> Children know:</p> <ul style="list-style-type: none"> • What a spreadsheet is • what a spreadsheet is used for. 	<p>Coding <u>A: Computer Science</u></p> <p>Action Character Coding Background Code block Collision detection Button Code design Command Design mode Input Object Program Properties Scale Stop command Sound When clicked When key</p> <p>Spreadsheets <u>B: Information Technology</u></p> <p>Arrow keys Cells Lock tool Backspace key Cursor Columns Clipart Count tool Delete key Image toolbox Move cell tool Rows</p>
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		<ul style="list-style-type: none"> • add the speak tool so that the items are counted out loud. • use a spreadsheet to help work out a fair way to share items. 		Speak tool spreadsheet
Year 2	Autumn 1	<p>Online Safety <u>C: Digital Literacy</u> Children can:</p> <ul style="list-style-type: none"> • use the search facility to refine searches on Purple Mash by year group and subject. • share the work they have created to a display board. • open and send an email to a 2Respond character. • Share their own experiences of using emails. • explain what a digital footprint is. • give examples of things that they would not want to be in their digital footprint. <p>Coding <u>A: Computer Science</u> <u>C: Digital literacy</u> Children can:</p> <ul style="list-style-type: none"> • explain that an algorithm is a set of instructions. • describe the algorithms they created. • explain that for the computer to make something happen, it needs to follow clear instructions • contrast the effect of the repeat command used with turtle objects to use of the repeat command with a character object • can begin to make choices about which object type to use. • explain what debug (debugging) means • debug simple programs. • explain why it is important to save their work after each functioning iteration of the program they are making 	<p>Online Safety <u>C: Digital Literacy</u> Children know:</p> <ul style="list-style-type: none"> • that the teacher approves work before it is displayed. • How things can be shared electronically for others to see both on Purple Mash and the Internet. • that Email is a form of digital communication. • how 2Repond can teach them how to use email. • What email is used for. • What makes us feel happy and what makes us feel sad. <p>Coding <u>A: Computer Science</u> <u>C: Digital literacy</u> Children know:</p> <ul style="list-style-type: none"> • how the turtle object moves. • how to use the repeat command with an object. • include a button in their programs. • that the turtle and character objects have different properties and move in different ways. • that the repeat and timer commands both make objects repeat actions but function differently and the type of object can affect which is the best command to use. • how to use a design document to start debugging a program 	<p>Online Safety <u>C: Digital Literacy</u> Search Displayboard Internet Sharing Email Attachment Digital footprint</p> <p>Coding <u>A: Computer Science</u> <u>C: Digital literacy</u> Action Algorithm Bug Character Code block Code design Command Debug/ debugging Design mode Input Object Properties Repeat Scale Timer When clicked When key</p>

		<ul style="list-style-type: none"> • create a computer program using different objects. • predict what the objects in classmates' programs will do, based on my knowledge of the objects' limitations, e.g. a turtle can only move in specific ways. • explain how they know that certain objects can only move in certain ways 		
Autumn 2		<p>Spreadsheets <u>B: Information Technology</u> Children can:</p> <ul style="list-style-type: none"> • explain what rows and columns are in a spreadsheet. • open, save and edit a spreadsheet. • add images from the image toolbox and allocate them a value. • add the count tool to count items. • use copying a pasting to help make spreadsheets. • use tools in a spreadsheet to automatically total rows and columns. • use a spreadsheet to solve a mathematical puzzle. • use images in a spreadsheet. • work out how much they need to pay using coins by using a spreadsheet to help calculate. • create a table of data on a spreadsheet. • use the data to create a block graph manually 	<p>Spreadsheets <u>B: Information Technology</u> Children know:</p> <ul style="list-style-type: none"> • the purpose of a spreadsheet • how to create graphs from a spreadsheet. 	<p>Spreadsheets <u>B: Information Technology</u> Backspace key Copy and paste Columns Cells Count tool Delete Key Equals tool Image toolbox Lock tool Move cell tool Rows Speak tool Spreadsheet</p>
Spring 1		<p>Questioning <u>B: Information Technology</u> Children can:</p> <ul style="list-style-type: none"> • use a range of yes/no questions to separate different items. • design a binary tree to sort pictures of pupils • match the 2Simple Avatar pictures to names using a binary tree. 	<p>Questioning <u>B: Information Technology</u> Children know:</p> <ul style="list-style-type: none"> • that the information on pictograms cannot be used to answer more complicated questions. • what is meant by a binary tree. • that questions are limited to 'yes' and 'no' in a binary tree. 	<p>Questioning <u>B: Information Technology</u> Pictogram Question Data Collate Binary tree Avatar database</p>

		<ul style="list-style-type: none"> use a database to answer simple and more complex search questions 	<ul style="list-style-type: none"> that the user cannot use 2Question to find out answers to more complicated questions. what is meant by a database. 	
Spring 2	Effective Searching <u>B: Information Technology</u> <u>C: Digital Literacy</u> Children can: <ul style="list-style-type: none"> recall the meaning of key Internet terms. complete a quiz about the Internet. identify the basic parts of a web search engine search page. read a web search results page search for answers to a quiz on the Internet. 	Effective Searching <u>B: Information Technology</u> <u>C: Digital Literacy</u> Children know: <ul style="list-style-type: none"> what search engines are used for how to use a search engine effectively 	Effective Searching <u>B: Information Technology</u> <u>C: Digital Literacy</u> Internet Search Search engine	
Summer 1	Creating Pictures <u>B: Information Technology</u> Children can: <ul style="list-style-type: none"> <i>explain what is meant by impressionist art.</i> use 2Paint a Picture to create art based upon this style. <i>explain what pointillism is.</i> use 2Paint a Picture to create art based upon this style. <i>describe the main features of Piet Mondrian's work.</i> <i>describe the main features of art that uses repeating patterns.</i> use 2Paint a Picture to create art by repeating patterns in a variety of ways. combine more than one effect in 2Paint a Picture to enhance patterns. <i>describe surrealist art.</i> use the eCollage function in 2Paint a Picture to create surrealist art using drawing and clipart. 	Creating Pictures <u>B: Information Technology</u> Children know: <ul style="list-style-type: none"> that art work can be created using technology. 	Creating Pictures <u>B: Information Technology</u> Impressionism Palette Pointillism Share Surrealism template	
Summer 2	Making Music <u>B: Information Technology</u> Children can:	Making Music <u>B: Information Technology</u> Children know:	Making Music <u>B: Information Technology</u> Bpm (beats per minute)	

		<ul style="list-style-type: none"> • use the different sounds within 2Sequence to create a tune. • add sounds to a tune they have already created to change it. • change the volume of the background sounds. • create two tunes which depict two feelings. • upload and use their own sound chosen from a bank of sounds. • create, upload and use their own recorded sound. • create their own tune using some of the chosen sounds. <p>Presenting Ideas <u>B: Information Technology</u> Children can:</p> <ul style="list-style-type: none"> • examine a traditional tale presented as a mind map, as a quiz, as an ebook and as a fact file. • make a quiz about a story using 2Quiz. • talk about their work and make improvements to solutions based on feedback received. • extract information from a 2Connect file to make a publisher fact file on a non-fiction topic. • add appropriate clipart. • add an appropriate photo. • use a variety of software to manipulate and present digital content and information. • collect, organise and present data and information in digital content. • create digital content to achieve a given goal by combining software packages 	<ul style="list-style-type: none"> • what 2Sequence is and how it works. • how to speed up and slow down tunes • what happens to the tune when sounds are moved. • how music can be used to express feelings. <p>Presenting Ideas <u>B: Information Technology</u> Children know:</p> <ul style="list-style-type: none"> • that digital content can be represented in many forms • that data can be structured in tables to make it useful. 	<p>Composition Digitally Instrument Music Sound effects (Sfx) Soundtrack Tempo Volume</p> <p>Presenting Ideas <u>B: Information Technology</u> Concept map (mind map) Node Animated Quiz Non-fiction Presentation Narrative audience</p>
Year 3	Autumn 1	<p>Online Safety <u>C: Digital Literacy</u> Children can:</p>	<p>Online Safety <u>C: Digital Literacy</u> Children know:</p> <ul style="list-style-type: none"> • what makes a good password for use on the Internet. 	<p>Online Safety <u>C: Digital Literacy</u> Password Internet Blog</p>

		<ul style="list-style-type: none"> • contribute to a concept map of all the different ways they know that the Internet can help us to communicate. • contribute to a class blog with clear and appropriate messages. • access and assess a 'spoof' website. • create their own 'spoof' webpage mock-up. • share their 'spoof' webpage on a class display board. • identify some physical and emotional effects of playing/watching inappropriate content/games. • relate cyberbullying to bullying in the real-world and have strategies for dealing with online bullying including screenshot and reporting. <p>Coding <u>A: Computer Science</u> Children can:</p> <ul style="list-style-type: none"> • create a design that represents a sequential algorithm. • use a flowchart design to create the code. • explain what Object, Action, Output, Control and Event are in computer programming. • explain how their program simulates a physical system, i.e. my vehicles move at different speeds and angles. • describe what they did to make their vehicle change angle. • show that their vehicles move at different speeds • make use of the X and Y properties of objects in their coding. • create an if statement in their program. • use a timer and if statement to introduce selection in their program. 	<ul style="list-style-type: none"> • the outcomes of not keeping passwords safe. • That passwords help to limit who can see personal / private / confidential information. • that some information held on websites may not be accurate or true. • How to search the Internet and how to think critically about the results that are returned. <p>Coding <u>A: Computer Science</u> Children know:</p> <ul style="list-style-type: none"> • how the use of the timer differs from the repeat command and can experiment with the different methods of repeating blocks of code • how to use a design document to start debugging a program • how to explain what debug (debugging) means. 	<p>Concept map Username Website Webpage Spoof website PEGI rating</p> <p>Coding <u>A: Computer Science</u> Action Algorithm Bug Code block Code design Command Control Debug/ debugging Design mode Event If Input Output Object Properties Repeat Computer simulation Selection Timer variable</p>
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		<ul style="list-style-type: none"> • explain what a variable is in programming. • explain why variables need to be named. • create a variable in a program. • set/change the variable values appropriately to create a timer. • show how their character repeats an action and explain how they caused it to do so. • how they made objects repeat actions • explain • debug simple programs. • explain why it is important to save their work after each functioning iteration of the program they are making. 		
Autumn 2		<p>Touch-typing <u>B: Information Technology</u> Children can:</p> <ul style="list-style-type: none"> • touch type the home, bottom, and top rows. • use two hands to type the letters on the keyboard. • touch type using the left hand. • touch type using the right hand. <p>Spreadsheets <u>B: Information Technology</u> Children can:</p> <ul style="list-style-type: none"> • create a table of data on a spreadsheet. • use a spreadsheet program to automatically create charts and graphs from data. • use the 'more than', 'less than' and 'equals' tools to compare different numbers and help to work out solutions to calculations. • use the 'spin' tool to count through times tables. • describe a cell location in a spreadsheet using the notation of a letter for the column followed by a number for the row. • find specified locations in a spreadsheet. 	<p>Touch-typing <u>B: Information Technology</u> Children know:</p> <ul style="list-style-type: none"> • the names of the fingers. • what is meant by – home, bottom, and top rows. <p>Spreadsheets <u>B: Information Technology</u> Children know:</p> <ul style="list-style-type: none"> • that spreadsheets are used to create charts and graphs for data. 	<p>Touch-typing <u>B: Information Technology</u> Posture Top row keys Home row keys Bottom row keys Space bar</p> <p>Spreadsheets <u>B: Information Technology</u> < > = Advance mode Copy and paste Columns Calls Delete key Equals tool Move cell tool Rows Spin tool spreadsheet</p>

	Spring 1	<p>Email A: Computer Science C: Digital Literacy Children can:</p> <ul style="list-style-type: none"> • list a range of different ways to communicate. • use 2Connect to highlight the strengths and weaknesses of each method. • order the various types of communication that have been used through history • open an email and respond to it. • send emails to other pupils in the class. • use the search option in the address book to find a classmate when sending an email • write rules about how to stay safe using email. • contribute to classmates' rules • attach work to an email • read and respond to a series of email communications. • attach files appropriately and use email communication to explore ideas 	<p>Email A: Computer Science C: Digital Literacy Children know:</p> <ul style="list-style-type: none"> • what an email is used for. • the importance of a draft • the importance of email safety • what CC means and how to use it • why the terms CC and BCC are used • when to use CC or BCC 	<p>Email A: Computer Science C: Digital Literacy</p> <p>Communication Email Compose Send Report to the teacher Attachment Address book Save to draft Password CC Formatting</p>
	Spring 2	<p>Branching databases B: Information Technology Children can:</p> <ul style="list-style-type: none"> • use YES/NO questioning to play a simple game with a friend. • explain why they choose a particular question to split their database. • begin to use 'or more and 'or less' in their questioning • contribute to a class branching database • edit and adapt a branching database to accommodate new entries. • choose a suitable topic for a branching database. • select and save appropriate images. • create a branching database. 	<p>Branching databases B: Information Technology Children know:</p> <ul style="list-style-type: none"> • how YES/NO questions are structured and answered. • how to use and debug their own and others branching databases. 	<p>Branching databases B: Information Technology</p> <p>Branching database Database Question data</p>

	<p>Summer 1</p>	<p>Simulations <u>B: Information Technology</u> Children can:</p> <ul style="list-style-type: none"> • give some examples of simulations used for fun and for work. • give suggestions of advantages and problems of simulations. • explore a simulation. • use a simulation to try out different options and to test predictions. • begin to evaluate simulations by comparing them with real situations and considering their usefulness. • analyse choices made using a branching database. • recognise patterns within simulations and make and test predictions. • identify the relationships and rules on which the simulations are based and test their predictions. • evaluate a simulation to determine its usefulness for purpose. • create their own [simple] simulation. <p>Graphing <u>B: Information Technology</u> Children can:</p> <ul style="list-style-type: none"> • set up a graph with a given number of fields. • enter data for a graph. • produce and share graphs made on the computer. • select most appropriate style of graph for their data and explain their reasoning. • present the results in a range of graphical formats. • use the sorting option to make analysis of their data easier. 	<p>Simulations <u>B: Information Technology</u> Children know:</p> <ul style="list-style-type: none"> • that a computer simulation can represent real and imaginary situations. <p>Graphing <u>B: Information Technology</u> Children know:</p> <ul style="list-style-type: none"> • Why graphs are created using technology. • How to analyse graphs and data. 	<p>Simulations <u>B: Information Technology</u> Simulation</p> <p>Graphing <u>B: Information Technology</u> Graph Field Data Bar chart Block graph Line graph Pie chart Row column</p>
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		<ul style="list-style-type: none"> select most appropriate style of graph for their data and explain their reasoning. 		
	Summer 2	<p>Presenting (Powerpoint) <u>B: Information Technology</u> Children can:</p> <ul style="list-style-type: none"> change the design of the slides. insert a new slide. insert pictures. edit pictures. insert video and audio. use animations in a presentation. use transitions in a presentation. add timings to a presentation. present using a PowerPoint slideshow create a presentation linked to a curriculum topic the pupils are studying or on a topic of the pupil's own choice. 	<p>Presenting (Powerpoint) <u>B: Information Technology</u> Children know:</p> <ul style="list-style-type: none"> what PowerPoint is. how to open PowerPoint. how to add text and format it. how to add shapes to a page. 	<p>Presenting (Powerpoint) <u>B: Information Technology</u> Animation Audio Design templates Entrance animation Font Media Presentation Presentation program Slide Slideshow Stock image Text box Text formatting Transition WordArt</p>
Year 4	Autumn 1	<p>Online Safety <u>C: Digital Literacy</u> Children can:</p> <ul style="list-style-type: none"> give examples of things that they would not want to be in their digital footprint. identify possible risks of installing free and paid for software determine whether activities that they undertake online, infringe another's' copyright take more informed ownership of the way that they choose to use their free time. They recognise a need to find a balance between being active and digital activities. give reasons for limiting screen time. 	<p>Online Safety <u>C: Digital Literacy</u> Children know:</p> <ul style="list-style-type: none"> that security symbols such as a padlock protect their identity online. the meaning of the term 'phishing' and are aware of the existence of scam websites. what a digital footprint is and how it relates to identity theft. that malware is software that is specifically designed to disrupt, damage, or gain access to a computer. what a computer virus is. the difference between researching and using information and copying it about citing sources that they have used 	<p>Online Safety <u>C: Digital Literacy</u> Computer virus Cookies Copyright Digital footprint Email Identity theft Malware Phishing Plagiarism Spam</p>

		<p>Coding A: Computer Science B: Information Technology Children can:</p> <ul style="list-style-type: none"> • use sketching to design a program and reflect upon their design. • create code that conforms to their design • create an 'If/else' statement. • set/change the variable values appropriately. • interpret a flowchart that depicts an if/else flowchart. • show how an object repeats an action and explain how they caused it to do so. • make an object respond to user keyboard input. • explain what a variable is when used in programming. • create a timer that prints a new number to the screen every second. • explain how they made their program change the number every second. • create an algorithm modelling the sequence of a simple event. • manipulate graphics in the design view to achieve the desired look for the program. • use an algorithm when making a simulation of an event on the computer. • make good attempts to break down their aims for a coding task into smaller achievable steps. • recognise the need to start coding at a basic level of abstraction to remove superfluous details from their program that do not contribute to the aim of the task. 	<p>Coding A: Computer Science B: Information Technology Children know:</p> <ul style="list-style-type: none"> • what a variable is in programming 	<p>Coding A: Computer Science B: Information Technology</p> <p>Action Alert Algorithm Bug Code design Command Debug/ debugging Design mode Event Get input If If/ else Input Output Object Repeat Selection Simulation Timer variable</p>
	Autumn 2			

		<p>Spreadsheets <u>B: Information Technology</u> Children can:</p> <ul style="list-style-type: none"> • use the number formatting tools within 2Calculate to appropriately format numbers. • add a formula to a cell to automatically make a calculation in that cell. • use the timer, random number and spin button tools. • combine tools to make fun ways to explore number. • use a series of data in a spreadsheet to create a line graph. • use a line graph to find out when the temperature in the playground will reach 20°C. • make practical use of a spreadsheet to help them plan actions. • Use the currency formatting in 2Calculate. • allocate values to images and use these to explore place value. • use a spreadsheet made in 2Calculate to check their understanding of a mathematical concept. 	<p>Spreadsheets <u>B: Information Technology</u> Children know:</p> <ul style="list-style-type: none"> • how spreadsheets are used to support in mathematical and scientific investigations. 	<p>Spreadsheets <u>B: Information Technology</u> Average Advance mode Copy and paste Columns Cells Charts Equals tool Formula Formula wizard Move cell tool Random tool Rows Spin tool Spreadsheet timer</p>
Spring 1		<p>Writing for different audiences <u>B: Information Technology</u> Children can:</p> <ul style="list-style-type: none"> • explore written material where the font size and type are tailored to the purpose of the text. • use text formatting to make a piece of writing fit its audience and purpose. • role-play the job of a journalist in a newsroom. • interpret a variety of incoming communications and use these to build up the details of a story. • use the incoming information to write their own newspaper report. • use 2Connect to mind-map ideas for a community campaign. 	<p>Writing for different audiences <u>B: Information Technology</u> Children know:</p> <ul style="list-style-type: none"> • that texts can be edited for different audiences and purposes. • Why it is useful to edit a text for audience and purpose. 	<p>Writing for different audiences <u>B: Information Technology</u> Font Bold Italic underline</p>

		<ul style="list-style-type: none"> • use these ideas to write a persuasive letter or poster as part of the campaign. • assess their texts using criteria to judge their suitability for the intended audience 		
	Spring 2	<p>Logo <u>A: Computer Science</u> Children can:</p> <ul style="list-style-type: none"> • follow simple Logo instructions to create shapes on paper. • follow simple instructions to create shapes in Logo. • create Logo instructions to draw patterns of increasing complexity. • write Logo instructions for a word of four letters. • follow Logo code to predict the outcome. • create shapes using the Repeat function. • find the most efficient way to draw shapes. • use the Procedure feature. • create 'flowers' or 'crystals' using Logo. 	<p>Logo <u>A: Computer Science</u> Children know:</p> <ul style="list-style-type: none"> • what the common instructions are in Logo and how to type them. • the pu and pd commands. 	<p>Logo <u>A: Computer Science</u> LOGO BK FD RT LT REPEAT SETPC SETPS PU PD</p>
	Summer 1	<p>Animation <u>B: Information Technology</u> Children can:</p> <ul style="list-style-type: none"> • put together a simple animation using paper to create a flick book. • make a simple animation using 2Animate. • use the Onion Skin tool to create an animated image. • use backgrounds and sounds to make more complex and imaginative animations. • use ideas from existing 'stop motion' films to recreate their own animation. • share their animations and comment on each other's work using display boards and blogs in Purple Mash. 	<p>Animation <u>B: Information Technology</u> Children know:</p> <ul style="list-style-type: none"> • what an animation frame is. • what the Onion Skin tool does in animation. • what 'stop motion' animation is and how it is created. 	<p>Animation <u>B: Information Technology</u> Animation Flipbook Frame Onion skinning Background Play Sound Stop motion Video clip</p>

		<p>Effective searching A: Computer Science B: Information Technology Children can:</p> <ul style="list-style-type: none"> • structure search queries to locate specific information • use search to answer a series of questions. • write search questions for a friend to solve • analyse the contents of a web page for clues about the credibility of the information. 	<p>Effective searching A: Computer Science B: Information Technology Children know:</p> <ul style="list-style-type: none"> • the difference between a real and spoof website 	<p>Effective searching A: Computer Science B: Information Technology Easter Egg Internet Internet Browser Search Search engine Spoof website website</p>
Summer 2		<p>Hardware investigators A: Computer Science Children can:</p> <ul style="list-style-type: none"> • name the different parts of a desktop computer. • Create a leaflet to show the function of computer parts. <p>Making Music B: Information Technology Children can:</p> <ul style="list-style-type: none"> • <i>use appropriate musical language to discuss a piece of music.</i> • <i>identify sounds in a piece of music.</i> • <i>explain how a piece of music makes them feel.</i> • <i>identify and recall a simple rhythm.</i> • <i>explain what tempo is and how changing it can change the mood of a piece of music.</i> • create their own simple rhythm using Busy Beats. • <i>show an understanding of melody.</i> • create a simple melodic pattern using 2sequence and Busy Beats. • <i>use a variety of notes, experimenting with pitch.</i> • explore and understand how music is created. • experiment with pitch, rhythm, and melody to create a piece of house music on Busy Beats. 	<p>Hardware investigators A: Computer Science Children know:</p> <ul style="list-style-type: none"> • What the function of the different parts of a computer is. <p>Making Music B: Information Technology Children know:</p> <ul style="list-style-type: none"> • How technology is used to create music. • What effects can be created using technology to create music. 	<p>Hardware investigators A: Computer Science Motherboard CPU RAM Graphics card Network card Monitor Speakers Keyboard and mous</p> <p>Making Music B: Information Technology Pitch Rhythm Pulse Tempo Dynamics Texture Melody Rippler House music</p>

Year 5	Autumn 1	<p>Online Safety A: Computer Science B: Information Technology C: Digital Literacy Children can:</p> <ul style="list-style-type: none"> • think critically about the information that I share online both about myself and others. • use the SMART rules as a source of guidance when online. • think critically about what they share online, even when asked by a usually reliable person to share something. • see how they can use images and digital technology to create effects not possible without technology. • cite all sources when researching and explain the importance of this. • Select keywords and search techniques to find relevant information and increase reliability <p>Coding A: Computer Science B: Information Technology Children can:</p> <ul style="list-style-type: none"> • use sketching to design a program and reflect upon their design. • create code that conforms to their design. • explain how their program simulates a physical system. • select the relevant features of a situation to incorporate into their simulation by using decomposition and abstraction. • reflect upon the effectiveness of their simulation. • explain what a variable is in programming. • set/change the variable values appropriately. • create a game which has a timer and score pad. 	<p>Online Safety A: Computer Science B: Information Technology C: Digital Literacy Children know:</p> <ul style="list-style-type: none"> • who to tell if I am upset by something that happens online. • What a good password is. • how image manipulation could be used to upset them or others even using simple, freely available tools and little specialist knowledge • the advantages and disadvantages of different forms of communication and when it is appropriate to use each. <p>Coding A: Computer Science B: Information Technology Children know:</p> <ul style="list-style-type: none"> • some ways that text variables can be used in coding. 	<p>Online Safety A: Computer Science B: Information Technology C: Digital Literacy</p> <p>Online safety Smart rules Password Reputable Encryption Identity theft Shared image Plagiarism Citations Reference bibliography</p> <p>Coding A: Computer Science B: Information Technology</p> <p>Action Alert Algorithm Bug Code design Command Control Debug/ debugging Design mode Event Get input If If/else Input Output Object Repeat</p>
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		<ul style="list-style-type: none"> • use variables to control the objects in the game. • create loops using the timer and If/else statements. • include buttons and objects that launch windows to websites and programs. • code a program that informs others. 		Sequence Selection Simulation Timer variable
Autumn 2	Spreadsheets <u>B: Information Technology</u> Children can: <ul style="list-style-type: none"> • create a formula in a spreadsheet to convert m to cm. • apply this to creating a spreadsheet that converts miles to km and vice versa. • use a spreadsheet to work out which letters appear most often. • use the 'how many' tool. • use a spreadsheet to work out the area and perimeter of rectangles. • use these calculations to solve a real-life problem • create simple formulae that use different variables. • create a formula that will work out how many days there are in x number of weeks or years. • use a spreadsheet to model a real life situation and come up with solutions that can be practically applied. 	Spreadsheets <u>B: Information Technology</u> Children know: <ul style="list-style-type: none"> • 	Spreadsheets <u>B: Information Technology</u> Average Advance mode Copy and paste Columns Cells Charts Equals tool Formula Formula wizard Move cell tool Random tool Rows Spin tool Spreadsheet timer	
Spring 1	Databases <u>B: Information Technology</u> Children can: <ul style="list-style-type: none"> • search a database to answer questions correctly • design an avatar for a class database. • enter information into a class database. • create their own database on a chosen topic. • add records to their database. 	Databases <u>B: Information Technology</u> Children know: <ul style="list-style-type: none"> • the different ways to search a database. • what a database field is and can correctly add field information. • how to word questions so that they can be effectively answered using a search of their database. 	Databases <u>B: Information Technology</u> Avatar Binary tree Charts Collaborative Data Database Find Record	

				Sort, group and arrange Statistics and reports table
Spring 2	Game Creator A: Computer Science Children can: <ul style="list-style-type: none"> • review and analyse a computer game. • describe some of the elements that make a successful game. • begin the process of designing their own game. • design the setting for their game so that it fits with the selected theme. • upload images or use the drawing tools to create the walls, floor, and roof. • design characters for their game. • decide upon, and change, the animations and sounds that the characters make. • make their game more unique by selecting the appropriate options to maximise the playability. • write informative instructions for their game so that other people can play it. • evaluate my their own and peers' games to help improve their design for the future. 	Game Creator A: Computer Science Children know: <ul style="list-style-type: none"> • what makes a game successful or challenging. 	Game Creator A: Computer Science Animation Computer game Customise Evaluation Image Instructions Interactive Screenshot Texture Perspective playability	
Summer 1	3D Modelling Concept Maps B: Information Technology Children can: <ul style="list-style-type: none"> • explore the different viewpoints in 2Design and make whilst designing a building. • adapt one of the vehicle models by moving the points to alter the shape of the vehicle while still maintaining its form. • Refine designs to prepare it for printing. • Print designs as a 2D net and then create a 3D model. 	3D Modelling Concept Maps B: Information Technology Children know: <ul style="list-style-type: none"> • what the 2Design and Make tool is for. • how to edit the polygon 3D models to design a 3D model for a purpose. • The possibilities of 3D printing. 	3D Modelling Concept Maps B: Information Technology CAD- Computer Aided Design Modelling 3D Viewpoint 2D Net 3D printing Points template	

	Summer 2	<p>Word Processing (Microsoft Word) <u>B: Information Technology</u> Children can:</p> <ul style="list-style-type: none"> • Create a word processing document altering the look of the text and navigating around the document. • edit images to reduce their file size. • edit their images within Word to best present them alongside text. • add appropriate text to their document, formatting in a suitable way. • use a style set in Word. • use bullet points and numbering • add text boxes and shapes. • consider paragraph formatting such as line spacing, drop capitals. • use page breaks, headers and footers. • add hyperlinks to places in the document and to an external website. • add an automated contents page. • add tables to present information. • edit properties of tables including borders, colours, merging cells, adding and removing rows and columns. • add word art for a heading. • use a Word template and edit it appropriately 	<p>Word Processing (Microsoft Word) <u>B: Information Technology</u> Children know:</p> <ul style="list-style-type: none"> • What a word processing tool is for. • how to add images to a word document. • the correct way to search for images that they are permitted to reuse. • how to attribute the original artist of an image. • How to wrap images and texts. • how to print their documents and can print ranges of pages. • How to format a page using a combination of images, headers and columns. • How to group objects. • How to lasso text to cut and paste within a page. • How to save a document so that it cannot be edited. 	<p>Word Processing (Microsoft Word) <u>B: Information Technology</u> Copyright Cursor Document Font In-built styles Merge cells Paragraph formatting Readability Template Text formatting Text wrapping Word Art Word processing tool</p>
Year 6	Autumn 1	<p>Online Safety <u>A: Computer Science</u> <u>B: Information Technology</u> <u>C: Digital Literacy</u> Children can:</p> <ul style="list-style-type: none"> • can take more informed ownership of the way that they choose to use their free time. They recognise a need to find a balance between being active and digital activities. • give reasons for limiting screen time. 	<p>Online Safety <u>A: Computer Science</u> <u>B: Information Technology</u> <u>C: Digital Literacy</u> Children know:</p> <ul style="list-style-type: none"> • about risks online including sharing location, secure websites, spoof websites, phishing and other email scams. • the steps they can take to protect themselves including protecting their digital footprint, 	<p>Online Safety <u>A: Computer Science</u> <u>B: Information Technology</u> <u>C: Digital Literacy</u> Digital footprint Password PEGI rating Phishing Screen time Spoof website</p>

		<ul style="list-style-type: none"> talk about the positives and negative aspects of technology and balance these opposing views. <p>Coding A: Computer Science B: Information Technology</p> <p>Children can:</p> <ul style="list-style-type: none"> plan a program before coding to anticipate the variables that will be required to achieve the desired effect. follow through plans to create the program. debug when things do not run as expected. explain what functions are and how they can be created and labelled in 2Code. explain how to move code from one tab to another in 2Code. explain how they organised code in a program into functions to make it easier to read. code programs that take text input from the user and use this in the program. attribute variables to user input. follow flowcharts to create and debug code. create flowcharts for algorithms using 2Chart. be creative with the way they code to generate novel visual effects. follow through the code of how a text adventure can be programmed in 2Code. adapt an existing text adventure to make it unique to their requirements. 	<p>where to go for help, smart rules and security software.</p> <ul style="list-style-type: none"> What they share impacts upon themselves and upon others in the long-term. The consequences of promoting inappropriate content online and how to put a stop to such behaviour when they experience it or witness it as a bystander. <p>Coding A: Computer Science B: Information Technology</p> <p>Children know:</p> <ul style="list-style-type: none"> of the need to code for all possibilities when using user input. 	<p>Coding A: Computer Science B: Information Technology</p> <p>Action Alert Algorithm Bug Code design Command Control Debug/ debugging Event Get input If If/ else Input Output Object Repeat Sequence Selection Simulation Timer variable</p>
Autumn 2		<p>Spreadsheets B: Information Technology</p> <p>Children can:</p> <ul style="list-style-type: none"> create a spreadsheet to answer a mathematical question relating to probability. take copy and paste shortcuts. problem solve using the count tool. 	<p>Spreadsheets B: Information Technology</p> <p>Children know:</p> <ul style="list-style-type: none"> How spreadsheets can be used in real life situations. 	<p>Spreadsheets B: Information Technology</p> <p>Average Advance mode Copy and paste Columns Cells</p>

		<ul style="list-style-type: none"> • create a machine to help work out the price of different items in a sale. • use the formula wizard to create formulae. • use a spreadsheet to solve a problem. • use a spreadsheet to model a real-life situation and come up with solutions. • make practical use of a spreadsheet to help plan actions. • use a spreadsheet to model a real-life situation and come up with solutions that can be applied to real life 		Charts Count (how many) tool Dice Equals tool Formula Formula wizard Move cell tool Random tool Rows Spin tool Spreadsheet timer
Spring 1	Blogging <u>A: Computer Science</u> <u>B: Information Technology</u> <u>C: Digital Literacy</u> Children can: <ul style="list-style-type: none"> • Create a blog with a specific purpose. • Post comments and blog posts to an existing class blog. • comment on and respond to other blogs. • assess the effectiveness and impact of a blog. 	Blogging <u>A: Computer Science</u> <u>B: Information Technology</u> <u>C: Digital Literacy</u> Children know: <ul style="list-style-type: none"> • How a blog can be used as an informative text. • The key features of a blog. • That the way in which information is presented has an impact upon the audience. • That blogs need to be updated regularly to maintain the audience’s interest and engagement. • The approval process that their posts go through and demonstrate an awareness of the issues surrounding inappropriate posts and cyberbullying. • That content included in their blog carefully considers the end user. 	Blogging <u>A: Computer Science</u> <u>B: Information Technology</u> <u>C: Digital Literacy</u> Audience Blog Blog page Blog post Collaborative icon	
Spring 2	Text Adventures <u>B: Information Technology</u> Children can: <ul style="list-style-type: none"> • map out a story-based text adventure. • use 2Connect to record their ideas. 	Text Adventures <u>B: Information Technology</u> Children know: <ul style="list-style-type: none"> • what a text adventure is. 	Text Adventures <u>B: Information Technology</u> Text-based adventure Concept map Debut Sprite	

		<ul style="list-style-type: none"> • turn a simple story with 2 or 3 levels of decision making into a logical design • use the full functionality of 2Create a Story Adventure mode to create, test and debug using their plan. • split their adventure-game design into appropriate sections to facilitate creating it. • map out an existing text adventure. • contrast a map-based game with a sequential story-based game. • create their own text-based adventure based upon a map. • use coding concepts of functions, two way selection (if/else statements) and repetition in conjunction with one another to code their game. • make logical attempts to debug their code when it does not work correctly. 		function
Summer 1	Networks <u>A: Computer Science</u> Children can: <ul style="list-style-type: none"> • explain the differences between more than two network types such as: LAN, WAN, WLAN, and SAN. • 	Networks <u>A: Computer Science</u> Children know: <ul style="list-style-type: none"> • the difference between the world wide web and the internet. • About their school network. • About Tim Berners-Lees. • Some of the major changes in technology which have taken place during their lifetime and the lifetime of their teacher/ another adult. 	Networks <u>A: Computer Science</u> Internet World Wide Web Network Local area network (LAN) Wide area network (WAN) Router Network cables wireless	
Summer 2	Quizzing <u>B: Information Technology</u> Children can: <ul style="list-style-type: none"> • use the 2DIY activities to create a picture-based quiz. • consider the audience’s ability level and interests when setting the quiz. • share their quiz and responded to feedback 	Quizzing <u>B: Information Technology</u> Children know: <ul style="list-style-type: none"> • The different question types within 2Quiz. • About the sorts of questions that are best suited to the different question types. 	Quizzing <u>B: Information Technology</u> Audience Collaboration Concept map Database quiz	

		<ul style="list-style-type: none">• chose an appropriate Text Toolkit tool to make their own grammar game.• Use a 2investigate quiz to answer questions.• Design their own quiz based on one of the 2investigate example databases.		
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