

Computing Overview				
	Lower Key Stage 2		Upper Key Stage 2	
	Year A	Year B	Year A	Year B
Autumn				
Information technology – context of use of computers in society and production of digital artefacts.	Year 3 : MM11 – MM15 - Examine newspaper front pages and decompose to find the elements. - Understand how to copy and paste, then cut and paste. - Create and combine visual media to meet a specific need. - Create audio recordings - Create, edit and annotate a range of 2D images. - Combine digital content from different sources using appropriate layouts.	Year 4: MM16 – MM19 - Develop an understanding of film shots and their effectiveness use. - Understand 2D plans and how they are used in real-life. - Create their own 2D plan of an historical place. - Create stop motion film (linked to science/topic) Compose, combine and refine music or sounds. - Identify features of good digital design	Year 5: MM20 – MM24 - Listen to digital content and identify the different elements in a radio ad. - Understand how the composition of digital content can evoke emotion and evaluate it - Design and create simple 3D model using Tinkercad - Understand basic presentation skills and apply them whilst presenting. Understand how a range of online spaces and tools can be used to create digital content.	Year 6 : MM25 – MM28 Split Class: recap of year 5 - Create 3D models using Tinkercad matched to Topic - Use Photopea to understand that images can be manipulated to spread false information. - Create their own video review using screenshots, music and video recordings. Design and create their own digital content (linked to Topic) including video, audio, text and the 3D model from 1st lesson.
Outcome	- Children can then compose their own newspaper story or adapt a piece of text. - Using a storyboard to plan, children produce a basic instructional video - Children perform their own poems, recording their performance on an i-pad. - Children create their own 2D room using google slides - Create their own “fake news” poster/leaflet/newspaper using green screen.	- Children design their own poster using Canva, understanding the elements of digital content - Children begin to understand camera shots – the different types and their use. Using a plan, they plan their own short film and create their own still shots using the video function on an i-pad. - Children begin their learning on presentations with basic digital elements. They create, present and evaluate their own text presentations explaining the key digital elements they have included - Children create a short film, using the different types of shots	- Children plan, edit and create their own radio adverts - Building on their basic film shot knowledge, children plan, create and edit a short film using i-movie, adding music and voice over. - Children can explain the difference between 2D and 3D and describe how 3D is used in real-life. The create their own basic 3D model. - Children create and evaluate their own presentation with basic elements and insert pictures and videos - Children work collaboratively to create a comic strip in Canva.	- Children build on their 3D knowledge in year 5 and create their own 3D model - Children learn that images can be manipulated. Through the use of selection tools, layers and filters they learn how to combine and edit images using Photopea. - Pupils build on their video editing skills by importing images, using screenshots, adding title cards and graphics. - Children create an in-depth book creator using pictures, videos, music, short film etc. to answer a wider curriculum ‘big question’
Online Safety	A1 Self-Image and Identity A2 Online Reputation Shaping online identities and how media impacts on gender and stereotypes .	A1 & A2 Online Bullying Strategies for effective reporting and intervention and how bullying and other threatening behaviour relates to legislation	A1 Online Reputation A2 Self Image & Identity Strategies to manage personal digital content effectively, their digital personality and capitalise on technology’s capacity to create effective positive profiles .	A1 & A2 Online Bullying Strategies for effective reporting and intervention and how bullying and other threatening behaviour relates to legislation. Including blocking users, capture bullying content for evidence

Spring				
Computing Strand Computer Science (Algorithms, programming, data and systems)	Year 3 CS11 – CS14 - Understand that all computers allow data to be input, processed and output - Understand all computers need programs/software to work. Decompose and sequence a range of algorithms and programs. - Create and refine programs that use simple inputs and outputs - Understand and use repetition to write more efficient code.	Year 4 CS15 – CS20 - Understand the composition of programs by decomposing. - Understand and apply selection in their own algorithms and programs - Predict what a piece of code will do and alter it to achieve an outcome. - Design and create programs using selection purposefully - Understand a computer network and describe.	Year 5 CS20 – CS25 - Understand and use variables in algorithms code (3 lessons) - Understand and use repetition in algorithms and programs. - Use more complex two-way selection in algorithms and programs. - Use a range of inputs and outputs devices in their programs. - Understand how search engines work and use them effectively.	Year 6 CS26 – CS29 - Understand procedures and use them in programs. - Design, create, evaluate and amend a program to meet a design brief - Use selection, variable, input and output to create a program using a physical device such as a computer/iPad.
Outcomes	- Children start to learn the difference between computing inputs and outputs and can name these in a venn diagram and produce a poster. - Understand what a program is, identify apps/programs they use and create a mind map. - They can identify 3 types of repetition and link this to real-life situations. - Children create a basic algorithm within scratch to sequence an event e.g. linked to science by identifying parts of a plant using logical reasoning	- Children decompose digital games - They begin to build on their knowledge of algorithms by looking at selection in real life situations - They create their own flow-charts, making algorithms using one-way selection e.g. if x happens do y. - Children use logical reasoning to de-bug basic games - Children create their own maze games applying their knowledge.	- Children begin to look at variables in computer science (e.g. score in a game) and make real-life links to them. - Children use logical reasoning to debug a game, changing the variables within scratch - Children build upon their input/output knowledge through the introduction and use of BBC Micro-Bits - They build up on their year 4 knowledge by creating flow charts using two-way selection e.g. if x happens do y, if it doesn't, do z. - As an additional lesson, children look at the functions of search engines and how they search using the key words of the question, how Google works and collect information on web sites to understand page ranking.	- Children create a dance program within scratch. - Children create their own interactive tour. They plan using a mind map, build code, use logical reasoning to de-bug, evaluate and improve their program, including variables, repetition and selection. - Children decompose an arcade game then create their own, considering their audience - As an additional lesson, building on their year 4 knowledge, they revise what a computer network is, moving to how this network connects to the WWW using the protocol HTTP, they understand the importance of encryption.
Online Safety	Sp1 & Sp2 Managing Online Information Strategies for effective searching, critical evaluation and ethical publishing .	Sp1 & Sp2 Online Relationships Relationships and behaviours that may lead to harm and how positive online interaction can empower and amplify voice.	Sp1 & Sp2 Managing Online Information Strategies for effective searching, critical evaluation and ethical publishing . Defining the terms of ' influence, manipulation and persuasion '. Strategies for identifying, flagging and reporting inappropriate content.	Sp1 Online Relationships Sp2 Copyright and Ownership Relationships and behaviours that may lead to harm and how positive online interaction can empower and amplify voice. Understanding consequences for things shared online such as using inappropriate images even if someone says its ok. Understanding their own accountability.

Summer				
Data Handling	Year 3 DH8-10 Recap of year 2 - Understand how data is structured in a database. - Understand how data is structured in a spreadsheet and enter data - Manipulate information in a database to solve simple questions.	Year 4 Data Handling: DH11- DH13 Split Class: Recap of year 3 - Understand the difference between data and information. - Understand what infographics are and create their own. - Use autosum in a spreadsheet to answer questions.	Year 5 DH14 – DH16 Search databases with multiple criteria using OR and AND searches. - Use forms to gather, interpret and share data (market research) - Use formulas in a spreadsheet	Year 6 DH17 – DH19 Split Class: Recap of Year 5 - Collect, represent and interpret real world data using averages and graphs in spreadsheets. - Test a hypothesis by gathering data and processing it into usable information. - Create grouped bar charts to visually compare sets of data.
Outcomes	- Children identify records and fields. They understand the importance of the right data and apply that knowledge to answering simple, real life questions. - Children can explain the structure of a simple spreadsheet and can identify cells and create tables. - Children build upon their database knowledge from the first lesson by manipulating data in a pre-populated database, making decisions about the way they sort and organise that data to answer questions. - Building to applying their knowledge to show their data in a basic digital graph which can be linked to science, maths or wider curriculum.	- Children understand the difference between data and information and collect information to turn it into data, creating a table and then a graph using google sheets - Children analyse Infographics and create them including digital elements - Children use the function 'applied to a detailed spreadsheet and graph	- Children use 'and' & 'Or' searches using real life data - Children use google forms to gather information on a topic. They plan, collect and then use this data to present to others in tables and graphs. - Following on from using autosum, children begin to use formulas in spreadsheets using the four mathematical operations	- Children conduct an experiment to see how exercise changes their heart rate. - They use their previous knowledge to collect and input data into a spreadsheet, then calculate average formatting the cells to a given number of decimal places. - Children look at hypothesis - a statement that can be tested by analysing data). They gather data and process it into usable information to develop a theory, they present their data as a presentation or an infographic e.g. football statistics, - Children gather data linked to their learning. They choose the right measurements to be used for a fair comparison, then present this data in tables, grouped bar charts (for comparison i.e. weather across two cities) or pie charts.
Online Safety	Su1 & Su2 Privacy and Security Behavioural and technical strategies to limit impact on privacy and protect data and systems against compromise.	Su1 Copyright and Ownership Su2 Health, Well-Being & Lifestyle LKS The impact that technology has on health, well-being and lifestyle including understanding negative behaviours and issues amplified and sustained by online technologies and the strategies for dealing with them.	Su1 & Su2 Privacy and Security Behavioural and technical strategies to limit impact on privacy and protect data and systems against compromise. Describe simple ways to increase personal privacy, identify content such as scams, phishing etc.	Su1 & Su2 Health, Well-Being & Lifestyle The impact that technology has on health, well-being and lifestyle including understanding negative behaviours and issues amplified and sustained by online technologies and the strategies for dealing with them. Discuss regulations for age-related content, settings on technology to help health such as regular breaks, night-mode.

Prior and Subsequent Coverage

The content we teach aims to build on what has come before and guide pupils towards being able to achieve KS3 outcomes through the brief that we set our pupils and the sequence of learning we plan each term.

	Prior Knowledge KS1	Subsequent Knowledge KS3
	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, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems - understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem - use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions - understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal] - understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems - understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits - undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability - understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns

Sequence of teaching in Computing:

Each sequence of lessons begins with a 'brief' so that pupils are clear the outcome and new learning expected by the end of the unit and an understanding of the audience they are designing for.

- Each lesson will begin with **activation of prior substantive knowledge** and a re-cap of where pupils are in the sequence of learning so that they are always focused on the purpose of their learning
- Every sequence of learning is set in the context of a 'brief' that the children must work within, helping them understand use of technology in the wider world
- Pupils will **look at effective examples of the outcome expected**, breaking it down to understand the component parts
- Pupils will apply their substantive knowledge through **focused practical tasks** increasing their procedural skill
- The three core constructs of **sequence, selection and repetition are secured** through repeated and increasingly complex encounters
- **Focused practical tasks** address misconceptions the pupils may have -giving them time to problem solve and use their computational thinking skills – considering decomposition and abstraction methods
- Wherever possible, they will **apply their learning in a new context**, understanding how their knowledge can be transferred
- They will then **evaluate their digital content created** and its ability to meet the needs of the audience established

The children in the mixed class (either 3/4 or 5/6) follow the curriculum mapped out for the older year group.

Due to the sequential nature of our substantive knowledge map, teachers can formatively assess their children's needs and spend longer activating prior knowledge and securing earlier taught knowledge before moving onto new concepts if needed.



Building pupils' automaticity



We ask our teachers to be mindful of reinforcing basic computing fluency when an opportunity presents itself, so that during computing lessons pupils are fluent and able to focus on computational thinking and reasoning.

We are mindful that pupils need to be familiar with each program/app that they use so that they can achieve fluency and continue towards mastery.

We teach information technology first each year, so that teachers can reinforce the mechanics of using different devices and programs.

<u>KS1</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
• Log into a chromebook/ ipad independently • Charge/put away their device independently • Take a photo and record video with an IPAD • Are able to explore a 360°image • Identify and locate the keys on the keyboard • Use caps lock for capital letters • Use the space bar only once between words • Dictate into a digital device • Record myself explaining what I have done • Create an animation to tell a story (simple stop-motion) • Sequence clips in animation software • Use a paint and drawing app • Learn to collaborate on a digital document • Use differing fonts and colours in a range of programs • Use tools such as book creator, google slides • Add voice labels to an image • Begin to use green screen with support	• Begin to use index fingers to type • Edit the style and effect of my text • Use cut, copy and paste • Start to input simple data into a spreadsheet (using google sheets) • Create a simple web page • Improve a created stop motion animation • Sequence clips and record a voice over in animation software (create my own movie trailer) • Independently create a green screen • Create a digital image using tools, pens, brushes	• Combine digital images from different sources for a variety of tasks • Confidently use cut, copy and paste and understand how to use simple shortcuts • Use some font sizes and types appropriately for audience and purpose • Use spell check and thesaurus • Input data into a spreadsheet and export it • Create an e-book with text, images and sounds • Create a presentation with a range of media • Add music and sound effects to my films • Confidently use a green screen • Manipulate shapes to create digital art • Create a simple song • Record an audiobook	• Start to apply usual effects such as hyperlinks • Organise and reorganise text on screen to suit a purpose • Create and publish my own online questionnaire and analyse the results (google forms) • Collaborate with peers using online tools (such as google drive) • Create and export an interactive presentation • Create a web page and embed video (google sites) • Add green screen effects to a stop motion • Make a digital photo using camera settings • Enhance digital photos using crop, brightness and re-size tools • Add voice over and edit sound clips	• Combine digital images from different sources to make a final piece • Confidently and regularly use text shortcuts such as cut, copy and paste to organise text • Use a range of font sizes and types appropriately for audience and purpose • Use spell check and thesaurus including through AI technology • Input and export data in a variety of ways • Create an e-book with text, images and sounds • Create a presentation with text, images and sounds – using a range of media • Add music and sound effects to my films • Add animated titles and transitions to my films • Confidently use green screen adding animated backgrounds