St Michaels First School Computing Whole School Curriculum Map

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	Exploring programs on the interactive whiteboard, listening to music, using the classroom computer to access learning games and art packages.					
EYs	Classroom computers	Using classroom computer, iPad and cameras	2 simple paint IWB games	Using word Bee-bot programming	IPads	Bee-bot programming Using videos and cameras
Year1	We Are Painters (illustrating an ebook)	We are celebrating (digital card)	We are collectors	We are storytellers	We are TV chefs	We are treasure hunters
Year 2	We are astronauts	We are games testers	We are researchers	We are detectives	We are photographers	We are zoologists
Year 3	We are programmers (Programming and animation)	We are bug fixers (finding and correcting bugs in programs)	We are presenters (videoing performances)	We are vloggers (making and sharing a short screencast presentation)	We are Communicators (communicating safely online)	We are opinion pollsters (collecting and analyzing data)
Year 4	We are programmers (coding)	We are toy designers	We are HTML editors	We are musicians	We are meteorologists	We are Co-authors

Purpose of Study (National Curriculum)

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

Aims (National Curriculum)

The national curriculum for computing aims to ensure that all pupils:

- **can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation**
- **can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems**
- **can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems**
- **are responsible, competent, confident and creative users of information and communication technology.**

Early Years Foundation Stage Curriculum – Computing in our Early Year will be included within the following areas of the Early Years Curriculum (in both adult led and continuous provision)

Our Computing scheme for the EYFS is centred around play-based, (plugged and unplugged) activities that focus on building children's listening skills, curiosity and creativity and problem solving.

Technology in the Early Years can mean:

- taking a photograph with a camera or tablet
- searching for information on the internet with support
- playing games on the interactive whiteboard
- exploring an old typewriter or other mechanical toys
- using a Beebot
- Using computer programs such as paint and online games
- watching a video clip
- listening to music

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

Assessment & Attainment Targets

By the end of each key stage, pupils are expected to know, apply and understand the knowledge and skills specified in the relevant programme of study. Online safety is also build within our computing curriculum to ensure that children continue to develop their knowledge, confidence and understanding in this aspect.

At St Michael's we assess computing at the end of each topic.

Curriculum Mapping Overview

Year Groups	**Programming**	**Computational thinking**	**Creativity**	**Computer networks**	**Communication/collaboration**	**Productivity**
	Planning, writing and testing computer programs for digital devices, from floor turtles to tablets.	Some of the computer science foundations – particularly algorithms, logical reasoning and decomposing problems into smaller parts.	Creating and refining original content using digital tools across a range of media.	Using and understanding the internet, the web and search engines, effectively and safely.	Making the most of computers and the internet for communicating with one or many, and working together on projects.	Collecting and analysing data and information using computers; organising, manipulating and presenting this
1	We are treasure hunters	We are TV chefs	We are painters	We are collectors	We are storytellers	We are celebrating
2	We are astronauts	We are games testers	We are photographers	We are researchers	We are detectives	We are zoologists
3	We are programmers	We are bug fixers	We are presenters	We are vloggers	We are communicators	We are opinion pollsters
4	We are software developers	We are toy designers	We are musicians	We are HTML editors	We are co-authors	We are meteorologists

Progression of skills and knowledge for all aspects of learning

Year Groups	**Programming : Planning, writing and testing computer programs for digital devices, from floor turtles to tablets.**
1 We are treasure hunters	• understand that a programmable toy can be controlled by inputting a sequence of instructions develop and record sequences of instructions as an algorithm • program the toy to follow their algorithm • debug their programs • predict how their programs will work.
2 We are astronauts	• have a clear understanding of algorithms as sequences of instructions • convert simple algorithms to programs • predict what a simple program will do • spot and fix (debug) errors in their programs.
3 We are programmers	• create an algorithm for an animated scene in the form of a storyboard • write a program in Scratch to create the animation • correct mistakes in their animation programs.
4 We are software developers	• develop an educational computer game using selection and repetition • understand and use variables • start to debug computer programs • recognise the importance of user interface design, including consideration of input and output.

Year Groups	**Computational Thinking : Some of the computer science foundations – particularly algorithms, logical reasoning and decomposing problems into smaller parts.**
Online safety key focus	Use technology safely and respectfully, keeping personal information private
Progression of Learning	
1 We are TV Chefs	• break down a process into simple, clear steps, as in an algorithm • use different features of a video camera • use a video camera to capture moving images • develop collaboration skills • discuss their work and think about how it could be improved
2 We are Games Testers	• describe carefully what happens in computer games • use logical reasoning to make predictions of what a program will do • test these predictions • think critically about computer games and their use • be aware of how to use games safely and in balance with other activities
3 We are Bug Fixers	• develop a number of strategies for finding errors in programs • build up resilience and strategies for problem solving • increase their knowledge and understanding of Scratch • recognise a number of common types of bug in software
4 We are Toy Designers	• design and make an on-screen prototype of a computer-controlled toy • understand different forms of input and output(such as sensors, switches, motors, lights and speakers) • design, write and debug the control and monitoring program for their toy

Year Groups	**Creativity : creating and refining original content using digital tools across a range of media.**
Online safety (key focus)	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour.
1 We are painters	• use the web safely to find ideas for an illustration • select and use appropriate painting tools to create and change images on the computer • understand how this use of ICT differs from using paint and paper • create an illustration for a particular purpose • know how to save, retrieve and change their work • reflect on their work and act on feedback received
2 We are photographers	• consider the technical and artistic merits of photographs • use a digital camera or camera app • take digital photographs • review and reject or pick the images they take edit and enhance their photographs • select their best images to include in a shared portfolio
3 We are presenters	• gain skills in shooting live video, such as framing shots, holding the camera steady, and reviewing edit video, including adding narration and editing clips by setting in/out points • understand the qualities of effective video, such as the importance of narrative, consistency, perspective and scene length
4 We are musicians	• use one or more programs to edit music • create and develop a musical composition, refining their ideas through reflection and discussion • develop collaboration skills • develop an awareness of how their composition can enhance work in other media

Year Groups	**Computer networks : using and understanding the internet, the web and search engines, effectively and safely.**
Online Safety (key focus)	Understand computer networks including the Internet and the opportunities they offer for communication and collaboration. Use search technologies effectively and appropriately, appreciate how results are selected and ranked, and be discerning in evaluating digital content. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.
1 We are Collectors	• find and use pictures on the web • know what to do if they encounter pictures that cause concern • group images on the basis of a binary (yes/no) question • organise images into more than two groups according to clear rules • sort (order) images according to some criteria • ask and answer binary (yes/no) questions about their images.
2 We are Researchers	• develop collaboration skills through working as part of a group • develop research skills through searching for information on the internet • improve note-taking skills through the use of mind mapping • develop presentation skills through creating and delivering a short multimedia presentation
3 We are vloggers	• use a search engine to learn about a new topic • plan, design and deliver an interesting and engaging presentation • search for, and evaluate, online images • create their own original images • create a screencast video of a narrated presentation • develop their understanding of how the internet, the web and search engines work
4 We are HTML editors	• understand some technical aspects of how the internet makes the web possible • use HTML tags for elementary mark up • use hyperlinks to connect ideas and sources • code up a simple web page with useful content understand some of the risks in using the web

Year Groups	**Communication/ collaboration : Making the most of computers and the internet for communicating with one or many, and working together on projects.**
Online Safety (key focus)	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. 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 technology safely, respectfully and responsibly; know a range of ways to report concerns and unacceptable behaviour.
1 We are storytellers	• use sound recording equipment to record sounds • develop skills in saving and storing sounds on the computer • develop collaboration skills as they work together in a group • understand how a talking book differs from a paper-based book • talk about and reflect on their use of ICT share recordings with an audience.
2 We are detectives	• understand that email can be used to communicate • develop skills in opening, composing and sending emails • gain skills in opening and listening to audio files on the computer • use appropriate language in emails • develop skills in editing and formatting text in emails • be aware of online safety issues when using email
3 We are communicators	• develop a basic understanding of how email works • gain skills in using email • be aware of broader issues surrounding email, including 'netiquette' and online safety • work collaboratively with a remote partner • experience video conferencing
4 We are co-authors	• understand the conventions for collaborative online work, particularly in wikis • be aware of their responsibilities when editing other people's work • become familiar with Wikipedia, including potential problems associated with its use • practise research skills • write for a target audience using a wiki tool • develop collaboration skills • develop proofreading skills.

Year Groups	**Productivity : Collecting and analysing data and information using computers; organising, manipulating and presenting this**
Online safety (key focus)	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. Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.
1 We are celebrating	• develop basic keyboard skills, through typing and formatting text • develop basic mouse skills • use the web to find and select images • develop skills in storing and retrieving files • develop skills in combining text and images • discuss their work and think about whether it could be improved
2 We are zoologists	• sort and classify a group of items by answering questions • collect data using tick charts or tally charts • use simple charting software to produce pictograms and other basic charts • take, edit and enhance photographs • record information on a digital map
3 We are opinion Pollsters	• understand some elements of survey design • understand some ethical and legal aspects of online data collection • use the web to facilitate data collection • gain skills in using charts to analyse data • gain skills in interpreting results
4 We are meteorologists	• understand different measurement techniques for weather, both analogue and digital • use computer-based data logging to automate the • recording of some weather data • use spreadsheets to create charts • analyse data, explore inconsistencies in data and make predictions • practise using presentation software and video