Computing *Curriculum*

Intent

At Maple Primary school it is our intention to prepare learners for the 21st century and give them opportunities to develop their skills and knowledge that will equip them for the digital world. We understand that computing has become increasingly important and that it is vital children have a thorough understanding of ICT for both home and employment. Our Computing curriculum aims to focus on progressing digital literacy, computer science, information technology and online safety. Throughout the children's time at school these themes are revisited and repeated to become embedded skills in the children's development. We also aim to promote computing in cross curricular ways to enhance their creativity and how digital literacy is used in the real world.

Implementation

- Teachers create a challenging, motivating and creative learning experience
- Teachers teach from the National Curriculum, supported by a clear set of skills and knowledge progression (see Computing whole school timetable)
- Skills and knowledge are built on year by year and sequenced appropriately according to our 'Switched on' Scheme to maximise learning for all children.
- Children are consistently and repeatedly reminded of how to use computing equipment safely and appropriately.
- Computing is taught with three main strands: digital literacy, computer science and information technology.
- Information technology: children learn to use and express themselves and develop their ideas using information technology

- Digital literacy: children develop practical skills in safe use of ICT and the ability to apply these skills to solve relevant, worthwhile problems.
- Computer science: children are to understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.
- Computing vocabulary is continuously pushed throughout computing lesson and repeated cross curricular year on year.
- Children will have access to the hardware (computers, tablets, programmable equipment) and software that they need to develop knowledge and skills of digital systems and their applications
- Children will have the opportunity to explore and respond to key issues such as digital communication, cyber-bullying, online safety, security, plagiarism and social media.
- Online safety is continuously pushed and children are reminded in each lesson what to do in computing scenarios that are unsafe. This is communicated with all teachers and parents.

Impact

By the end of the children's journey at Maple Primary school it is important that children have a strong understanding of how Computing is used and how it is important to everyday life. We have a strong, high quality scheme of work that is planned to demonstrate progression throughout the years and build on their knowledge and key skills. Children will understand the importance of online safety and the impact that may have on them in the future. The impact of our curriculum will be monitored by self and teacher assessment as well as learning walks and subject discussions with the computing lead. If children keep up with the curriculum set out and key skills shown in our whole school overview then we are confident they will understand how the world of computing influences our everyday lives and how to use technology efficiently and to the best of their ability.

Computing

Curriculum Map

		Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Autumn	Children know how to recognise a range of technology that is used in places such as homes and school. Introducing basic computer programmes and hardware – children to use these with increasing control Children can talk about what they are doing on a computer Create firework pictures on 2simple Use a range of hardware - 2 simple IWB Ipads Laptops	We are treasure hunters: Following instructions, hunt for treasure. Key skills: This unit will enable the children to: 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. We are celebrating: Winter Card Key skills: This unit will enable the children to: develop basic keyboard skills,	We are astronauts – programming on screen Key Skills: This unit will enable the children to: 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. We are games testers – exploring how computer games work Key Skills: This unit will enable the children to:	First half term: Programming on scratch – create a storyline on scratch Key Skills: This unit will enable the children to: 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. Second half term: Debugging on scratch Key Skills: Develop a number of strategies for finding errors in Programs	Unit 4.2 – We are Toy Designers – (Prototyping an interactive toy - programming on Scratch). Key Skills: 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. We are musicians: (This unit has a strong creative focus, with pupils developing digital *content*, in form of a musical composition.)	We are game developers – developing an interactive game (Programming) Key skills: Create original artwork and sound for a game Design and create a computer program for a computer game, which uses sequence, selection, repetition and variables Detect and correct errors in their computer game Use iterative development techniques (making and testing a series of small changes) to improve their game. We are cryptographers	We are app planners- Planning the creation of a mobile app. Key skills: Develop an awareness of the capabilities of smartphones and tablets. Understand geolocation, including GPS. Identify interesting, solvable problems. Evaluate competing products. Pitch a proposal for a smartphone or tablet app. We are project managers: Scope a project to identify different components that must be

			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.	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.	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.	<u>Key skills:</u> 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.	(The pupils learn more about communicating information securely through an introduction to cryptography. <u>Key skills:</u> They investigate early methods of communicating over distances, learn about two early ciphers, and consider what makes a secure password). Be familiar with semaphore and Morse code Understand the need for private information to be Encrypted Encrypt and decrypt messages in simple ciphers Appreciate the need to use complex passwords and to keep them secure	successfully combined. <u>Key skills:</u> Identify their existing talents and plan how they can develop further knowledge and skills. Identify the component tasks of a project and develop a timeline to track progress. Identify the resources they'll need to accomplish a project. Use web-based research skills to source tools, content and other resources. Consider strategies to ensure the quality of a collaborative project.

							Have some understanding of how encryption works on the web.	
	Spring	Developing instructions Using internet to find out facts Typing on a word document Sending documents to the printer and going to collect it Collect and insert data into a bar graph <u>Use a range of hardware -</u> 2 simple IWB Ipads Laptops Beebots	We are painters: Look at characters from fairy tales. <u>Key Skills:</u> This unit will enable the children to: 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.	We are researchers – researching a topic using search engines <u>Key Skills:</u> This unit will enable the children to: 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. We are photographers – taking, selecting	First half term: We are presenters – using video cameras to find out how a TV programme is made. <u>Key Skills:</u> 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. Second half term: We are vloggers:	We are HTML editors: (learn about the history of the web, before studying HTML (hypertext mark-up language), the language in which web pages are written. They learn to edit and write HTML, and then use this knowledge to create a web page.) <u>Key skills:</u> 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.	We are artists (use vector and turtle graphics to explore geometric art, taking inspiration from the work of Escher, Riley and traditional Islamic artists, as well as experimenting with complex 'fractal' landscapes). <u>Key skills:</u> develop an appreciation of the links between geometry and art Become familiar with the tools and techniques of a vector graphics package Develop an understanding of turtle graphics Experiment with the tools available, refining and developing their work as they apply their own	We are market researchers: (based on Questionnaire for Business Launch items for sale.) <u>Key skills:</u> Create a set of good survey questions. Analyse the data obtained from a survey. Work collaboratively to plan questions. Conduct an interview/focus group. Present their research findings. We are interface designers: <u>Key skills:</u> Work collaboratively to design the app's interface.

			We are T.V. Chefs: Tell a robot what to do, draw steps at making a snack. <u>Key Skills:</u> This unit will enable the children to: 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.	and editing digital images <u>Key Skills:</u> This unit will enable the children to: 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.	Research a topic that you want to present and doing it in a blog. <u>Key Skills:</u> 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.	Understand some of the risks in using the web (link to e-safety and Safer Internet Day in February). Unit 4.1 – We are software developers (Programming on Scratch - possible link to times tables). <u>Key skills:</u> 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.	criteria to evaluate it and receive feedback from their peers Develop some awareness of computer-generated art, in particular fractal-based landscapes. We are web developers (Create a website explaining online safety and responsible online behaviour). <u>Key skills:</u> Develop their research skills to decide what information is appropriate -understand some elements of how search engines select and rank results Question the plausibility and quality of information Develop and refine their ideas and text	Use wire framing tools to create a design prototype of their app. Develop or source the individual interface components (media assets) they will use. Address accessibility and inclusion issues. Document their design decisions abd the process they've followed.

							Collaboratively develop their understanding of online safety and responsible use of technology.	
	Summer	Hour of code Taking our own photos on cameras Use a paint programme with increasing mouse control <u>Use a range of hardware -</u> 2 simple IWB Ipads Laptops Cameras	We are collectors: Animals- Looking for pictures and sorting animals into groups. <u>Key Skills:</u> This unit will enable the children to: Find and use pictures on the web and know what to do if they encounter pictures that cause concern. Group images on the basis of a binary (yes/no) questions. Organise images into more than two groups according to clear rules	We are detectives – communicating clues <u>Key Skills:</u> This unit will enable the children to: 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	First half term; We are communicators – Emails, writing to another class and working on presentation. <u>Key Skills:</u> Develop a basic understanding of how email works Gain skills in using email be aware of broader issues surrounding email, including 'etiquette' and online safety Work collaboratively with a remote partner	We are co-authors (Pupils collaborate to create a 'mini Wikipedia'. They then go on to add or amend content on the real Wikipedia.) <u>Key skills:</u> Pupils 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	We are architects – creating a virtual space (Productivity) <u>Key skills</u> understand the work of architects, designers and Engineers -working in 3D develop familiarity with a simple CAD (computeraided design) tool -develop spatial awareness by exploring and experimenting with a 3D virtual environment We are bloggers – sharing experiences and opinions	We are app developers: <u>Key skills:</u> Become familiar with another programming toolkit or development platform. Import existing media assets to their project. Write down the algorithms for their app. Program, debug and refine the code for their app. Thoroughly teat and evaluate their app. We are marketers:

		Reception Key Skills 30-50 months (Technology) -Knows how to operate simple equipment. - Shows an interest in technological toys with knobs or pulleys, or real objects. - Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images. - Knows that information can be retrieved from computers. 40-60 months (Technology) -Completes a simple program on a computer. - Interacts with age-appropriate computer software. ELG - Technology Children recognise that a range of technology is used in places such as homes and schools.	Sort (order) images according to some criteria Ask and answer binary (yes/no) questions about their images. We are Storytellers: Creating a talking book Key Skills: This unit will enable the children to: 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	formatting text in emails Be aware of online safety issues when using email. We are zoologists – recording bug hunt data Key Skills: This unit will enable the children to: 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.	Experience video conferencing. Second half term: We are opinion pollsters – Decide topic on your survey and collect data and turn this into charts. Key Skills: 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.	Practise research skills. Write for a target audience using a wiki tool. Develop collaboration skills. Develop proofreading skills. We are meteorologists (Children take on the role of meteorologists and weather presenters – link to Geography and Science). Key skills: 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	(Communication / collaboration) Potentially link to work from Gilwell? Key skills: Become familiar with blogs as a medium and a genre of writing -create a sequence of blog posts on a theme -incorporate additional media comment on the posts of others -develop a critical, reflective view of a range of media, including text.	Key skills: Consider key marketing messages, including identifying a unique selling point. Develop a printed flyer or brochure incorporating text and images. Further develop knowledge, skills and understanding in relation to creating a website. Further develop skills relating to shooting and editing video.

		They select and use technology for particular purposes.	recordings with an audience.			presentation software and, optionally, video.		