



FOUR MARKS CE PRIMARY SCHOOL

COMPUTING CURRICULUM MAP

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Four Marks CE Primary School
Computing Curriculum Map

Purpose of study 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. It draws together the strands of computer science, information technology and digital literacy. 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 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

The revised Early Years Foundation Stage (EYFS) Statutory Framework (September 2021) no longer includes specific computing or technology elements. Children will continue to engage with and explore the use of technology in their everyday play and learning. The foundations for e-safety are covered, both in the RSHE curriculum and the new framework objectives, for example:

- **Develop their sense of responsibility and membership of a community.**
- **Select and use planned activities and resources, with help when needed.**
- **Build constructive and respectful relationships**
- **Remember and demonstrate rules without needing an adult to remind them**
- **Explain the reasons for rules, know right from wrong and try to behave accordingly**
- **Consider the feelings of others**

Key Stage 1 Programmes of study

At 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 1: Years 1&2

Skills progression

CYCLE A			CYCLE B		
Autumn	Spring	Summer	Autumn	Spring	Summer
Up, Up and Away Problem solving and logical thinking • To create a simple series of instructions - left and right record their routes • To understand forwards, backwards, up and down? • To put two instructions together to control a programmable device • To begin to plan and test their instructions	Doctor Doctor!: Creative Content • To create original content using digital technology? • To use digital technology to store and retrieve content	There's no place like home. Digital Literacy • To recognise the different forms of digital communication (e.g. emails address, twitter)? • To understand the appropriate vocabulary according to equipment available • To develop awareness and use of keyboard layout and use navigation skills appropriately (e.g. backspace, enter, spacebar, mouse)?	Fire, Fire! Where in the UK is Barnaby Bear? Problem solving and logical thinking • To predict the outcomes of a set of instructions? • To program using sequences of instructions to implement an algorithm • To create an algorithm for your partner to debug • To test and amend a set of instructions	Journeys into the Unknown Creative Content • To find information on a website • To use a web page as a resource • To experiment with drawing tools, text, pictures and animation to create content (e.g. presentation, eBook) • to create	All around us. Digital Literacy • to communicate safely online • To create, edit and format text (insert/delete words, use bold/italics/underline)
E-safety					
Dangers of sharing personal information online.	Identifying the correct actions on discovery of online content, they are unsure of; including identifying people to help.	Recognise advertising on websites and learn to ignore it. Begin to understand that not everything on the internet is true.	Identifying what is personal information. Investigate appropriate and inappropriate behaviour online.	To use key vocabulary to give simple examples of why information should not be shared digitally.	Demonstrate how to safely open and close applications and log on and off websites.

Greater Depth

- Can they use and apply logical thinking to solve a problem involving programming? (e.g. programming a Bee Bot with a missing direction button)
- Can they use digital technology to organise and edit content? (e.g. text in an app, editing images)
- Can they apply their navigational skills for a specific function or purpose? (e.g. capturing a photo in the Camera app and importing this into another appropriate app)
- Can they appreciate that some algorithms are more efficient than others and use methods of efficiency to test these? (e.g. most efficient method to enable a sprite to move left and right along the x axis or up and down along the y axis)
- Can they use digital technology to create, organise and edit a range of content for a specific purpose using an appropriate app?
- Can they consider how text is presented and formatted and adapt this to suit the purpose of a document?

Possible Activities

Cycle A			Cycle B		
Autumn	Spring	Summer	Autumn	Spring	Summer
Up, Up and Away Moving a robot	Doctor Doctor!: Digital painting Digital photography	There's no place like home. Technology around us Information technology around us	Fire, Fire! Where in the UK is Barnaby Bear? Robot algorithms Programming animations	Journeys into the Unknown Making Music Pictograms	All around us. Digital Writing
Children will use directional language to create a simple series of instructions – left, right, forwards, backwards, up and down. Putting two instructions together to control a programmable device (Bee-bots) E-safety – Children will start to recognise that personal information should not be shared online. None	Children will use iPads to create original content, learning to take photographs/filming, storing and retrieving the content. E-safety – children will consider how to act if they discover something digitally, they are unsure of eg; identifying people who can help.	Children will learn to recognise forms of communication, emails, text messages. They will develop their use of the keyboard eg. backspace, enter and mouse skills. E-safety – children recognise advertising on websites, learn to ignore it and begin to understand that not everything on the internet is true.	Children will begin to learn to program using sequences of instructions to implement an algorithm and learn to debug. Predictions of outcome will be investigated, tested and amended. E-safety – Identify what counts as personal information and what is appropriate and inappropriate behaviour online.	Children will begin to investigate making music digitally. Identifying patterns within notes and connecting images with sounds. They will also learn to present information using a computer. E-safety – To use key vocabulary to give simple examples of why information should not be shared digitally: <i>safe, meet, accept, reliable, tell, online, trusted, adult, information, safety, personal, share, stranger.</i>	Children will learn to create, edit and format text online. Children will also learn how to communicate safely online. E-safety – Demonstrate how to safely open and close applications and log on and off websites.

Key Stage 2 Programmes of study focus on

At 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 Stage 2: Years 3&4

Skills Progression

CYCLE A			CYCLE B		
AUTUMN	SPRING	SUMMER	AUTUMN	SPRING	SUMMER
Full Steam Ahead Problem solving and logical thinking To experiment with variables to control models • To give an on-screen robot directional instructions (e.g. 90/45 degree turns) • To write more complex programs (leading to varying outcomes) • To understand input and output • To use commands to draw a shape (e.g. square, rectangle and other regular shapes on screen)	Angry Earth Creative Content • To use editing software to manipulate media (e.g. crop, add effects, manipulate audio) • To manipulate sound • To combine text, images and sounds and show awareness of audience	It's Chocolate! Digital Literacy • To open and send an attachment • To find relevant information by browsing a menu • To search for an image, then copy and paste it into a document • To copy and paste text into a document • To know how to manipulate text (e.g. underline text, centre text, change font and size) • To save files (e.g. word doc, pictures) to an appropriate folder?	Where do we come from? Problem solving and logical thinking • To use repeat instructions to draw regular shapes on screen, using commands. • To experiment with variables to control models. • To make turns specifying the degrees. • To make accurate predictions about the outcome of a program they have written • To give an on-screen robot specific directional instructions that takes them from x to y?	Temples, Tombs and Treasure Creative Content • To capture images using a range of devices (e.g. webcams, screen capture, scanning) • To select media to download, import or export • To copy graphics from a range of sources and paste into a desktop publishing program? • To insert media into a presentation (image, video, audio)? • To know how to manipulate text, underline text, centre text, change font and size and save text to a folder? • To create a presentation that is aimed at a specific audience?	River Deep & Mountain High Digital Literacy • To identify the benefits of ICT to send messages and to communicate • To use the automatic spell checker to edit spellings • To use a search engine to find a specific website • To know how to manipulate text (e.g. underline text, centre text, change font and size) • To navigate using an internet browser (e.g. use tabbed browsing to open two or more web pages at the same time, open a link to a new window)?

Greater Depth

- Can they recognise the impact of keyword choice on search engine results? (e.g. results ranked according to relevance or reliability of content and credibility of sources)
- Can they use a range of block code to identify and evaluate the most efficient and appropriate use? (e.g. events, motion, sensing, sound, control)
- Can they evaluate content (created/researched) against a given goal? (e.g. research used to create a narration for a story)
- Can they design and create content on a computer in response to a given goal, paying attention to the needs of a known audience? (e.g. digital artwork linked to their topic, themes or core text)
- Can they give reasons for errors in programs and explain how they have corrected these through decomposition and debugging?
- Can they explain an algorithm using sequence, repetition and selection in their own words?

E Safety

Do they recognise the difference between the work of others which has been copied (plagiarism) and restructuring and re-presenting materials in ways which are unique and new?

- Can they recognise that cyber bullying is unacceptable and will be sanctioned in line with the school's policy?
- Do they understand the need for caution when using an internet search for images and what to do if they find an unsuitable image?

Knowledge and understanding

- Do they understand the need for rules to keep them safe when exchanging learning and ideas online?
- Can they recognise that information on the internet may not be accurate or reliable and may be used for bias, manipulation or persuasion?
- Do they understand that the internet contains fact, fiction and opinion and begin to distinguish between them?
- Can they use strategies to verify information, e.g. cross-checking?
- Do they understand the need for caution when using an internet search for images and what to do if they find an unsuitable image?
- Do they understand that copyright exists on most digital images, video and recorded music?
- Do they understand the need to keep personal information and passwords private?
- Do they understand that if they make personal information available online it may be seen and used by others?
- Do they know how to respond if asked for personal information or feel unsafe about content of a message?
- Can they recognise that cyber bullying is unacceptable and will be sanctioned in line with the school's policy?
- Do they know how to report an incident of cyber bullying?
- Do they know the difference between online communication tools used in school and those used at home?
- Do they understand the need to develop an alias for some public online use?

Skills

Do they follow the school's safer internet rules?

- Do they recognise the difference between the work of

others which has been copied (plagiarism) and re-structuring and re-presenting materials in ways which are unique and new?

- Can they begin to identify when emails should not be opened and when an attachment may not be safe?
- Can they explain how to use email safely?
- Can they use different search engines?

Possible Activities					
CYCLE A			CYCLE B		
AUTUMN	SPRING	SUMMER	AUTUMN	SPRING	SUMMER
Full Steam Ahead	Angry Earth	It's Chocolate!	Where do we come from?	Temples, Tombs and Treasure- Egypt	River Deep & Mountain High
Scratch	Desktop publishing Introduction to word & powerpoint	Animation	Scratch	Desktop publishing	Web research
We will use the programme Scratch give an on-screen robot directional instructions (e.g. 90/45 degree turns) and move on to write more complex programs leading to varying outcomes. We will learn what inputs and outputs are and to use commands to draw a shape (e.g. square, rectangle and other regular shapes on screen). E-Safety – the children will start to recognise cyber-bullying and how to keep themselves safe.	Publishing an e-book using 'Book Creator': The children will use the iPad for Book Creator to publish their own 'Storm' inspired books. Using editing software, children will learn to crop and add effects. E-safety – children will learn to search the internet for appropriate images and develop an understanding of what is an unsuitable image.	Children will learn to open and send attachments through email. They will consider the relevance of information when browsing the internet and search for an image, copy and paste it into a document. E-safety – children will learn the importance of keeping personal information private online and how to respond when asked online for personal information.	Children will learn simplistic coding and be able to repeat instructions to create a project, using commands. This will include making predictions with increasing accuracy regarding the end result. E-safety – Develop an understanding of the potential risks of plagiarism and re-structuring materials online.	The children will capture images using a range of devices and then select which media to download, import or export. They will learn to copy and paste into a desktop publishing programme and how to manipulate text in different ways. Children will also investigate how digital devices can change the way we work and explore how devices can be connected, recognising the physical components of a network. E-safety – Children will investigate and demonstrate understanding of age appropriate websites, adverts and games.	The children will identify the benefits of using ICT to send messages and communicate, and learn to use a spell checker effectively. They will explore how to use search engines to find specific websites and continue to build their skills in manipulating text. E-safety – Children will begin to identify when an email or attachment is unsafe to open and the potential risks involved.

Key Stage 2: Years 5&6

Skills Progression

CYCLE A			CYCLE B		
Autumn	Spring	Summer	Autumn	Spring	Summer
Survival (Island Enquiry) Problem solving and logical thinking	Cluedo (Wind Turbines- Miracle or Menace) Creative Content	Who Goes There? Digital Literacy	The Final Frontier (Shackleton) Problem solving and logical thinking	It's all Greek to me! Creative Content	The Battle of Britain: Bombs, Battles & Bravery. Digital Literacy
- To combine sequences of instructions and procedures to turn devices on or off - To understand input and output - To explore 'What is' questions by playing adventure or quest games - To plan a solution to a problem using decomposition (e.g. developing a computer game, creating a website)	- To listen, download, produce and upload a variety of broadcast media (e.g. live streaming, podcast) - To manipulate sounds using audio editing software (e.g. Audacity)? - To select music from a variety of sources and incorporate it into multimedia presentations - To work on simple film editing? - Can they use a range of presentation applications? - Can they use technology to capture a range of multimedia.? - Can they make a home page for a website that contains links to other pages? - To prepare and then present a simple film? (e.g. Storyboarding and then filming/editing)	- To conduct a video chat with someone elsewhere in the school or in another school - To use bullets and numbering tools? - To use a search engine using keyword searches - To compare the results of different searches? - To download a document and save it to the computer - To decide which sections are appropriate to copy and paste from at least two web pages?	- To explain how an algorithm works - To detect errors in a program and correct them - To explore 'what if' questions by planning different scenarios for controlled devices - To use input from sensors to trigger events? - Wedo Lego, Makey Makey) - To design, write and debug their own computer control application	- To explore the menu options and experiment with images (colour effects, options, snap to grid, grid settings etc.) - To add special effects to alter the appearance of a graphic? - Can they 'save as' gif or i peg. wherever possible to make the file size smaller (for emailing or downloading)? - To make an information poster using their graphics skills to good effect? - To present a film for a specific audience and then adapt same film for a different audience? - To create a sophisticated multimedia presentation?	- To conduct a video chat with people in another country or organisation? - To contribute to discussions online? - To use a search engine using keyword searches - To confidently choose the correct page set up option when creating a document - To confidently use text formatting tools, including heading and body text - To use complex searches using such as '+' 'OR' "Find the phrase in inverted commas"

Greater Depth

- Can they create a multimedia project that contains an appropriately selected range of media? (e.g. audio, video clips)
- Can they save an image using a range of commands? (e.g. 'control' and 'save image as' or 'drag and drop to 'downloads' folder)
- Can evaluate content according to its effectiveness and impact on a target audience?
- Can they write programs that have sequences, repetitions and variables? (e.g. creating a scoring system as part of a Scratch game)
- Do they consider audience when editing media and justify their choices?
- Can they incorporate images within a document or project where appropriate, using the most effective text wrapping formats within documents? (e.g. selecting 'wrap to text' or layering images in the Photoshop app)
- Can they compare the information provided on two tabbed websites looking for bias and perspective? (e.g. evaluating the source of content, reliability and credibility of content, sharing information on secure and encrypted websites)
- Can they apply a range of logical and computational thinking to program robotics and simulate this using an appropriate?

E Safety

- Can they independently, and with regard for e-safety, select and use appropriate communication tools to solve problems by collaborating and communicating with others within and beyond school?
- Do they understand they should not publish other people's pictures or tag them on the internet without permission?
- Do they know that content put online is extremely difficult to remove
- Do they understand that some material on the internet is copyrighted and may not be copied or downloaded?
- Do they recognise the potential risks of using internet communication tools and understand how to minimise those risks (including scams and phishing)?
- Do they understand that some malicious adults may use various techniques to make contact and elicit personal information?

Knowledge and understanding

- Can they discuss the positive and negative impact of the use of ICT in their own lives and those of their peers and family?
- Do they understand the potential risk of providing personal information online?
- Do they recognise why people may publish content that is not accurate and understand the need to be critical evaluators of content?
- Do they understand that some websites and/or pop-ups have commercial interests that may affect the way the information is presented?
- Do they recognise the potential risks of using internet communication tools and understand how to minimise those risks (including scams and phishing)?
- Do they understand that some material on the internet is copyrighted and may not be copied or downloaded?
- Do they understand that some messages may be malicious and know how to deal with this?
- Do they understand that online environments have security settings, which can be altered, to protect the user?
- Do they understand the benefits of developing a 'nickname' for online use?
- Do they understand that some malicious adults may use various techniques to make contact and elicit personal information?
- Do they know that it is unsafe to arrange to meet unknown people online?
- Do they know how to report any suspicions?
- Do they understand they should not publish other people's pictures or tag them on the internet without permission?
- Do they know that content put online is extremely difficult to remove?
- Do they know what to do if they discover something malicious or inappropriate?

Skills

- Do they follow the school's safer internet rules?
Can they make safe choices about use of technology?
Do they use technology in ways which minimises risk, e.g.
- responsible use of online discussions, etc?
Can they create strong passwords and manage them so that
- they remain strong?
Can they independently, and with regard for e-safety, select
- and use appropriate communication tools to solve problems by collaborating and communicating with others within and beyond school?
- Can they competently use the internet as a search tool? • Can they reference information sources?
Can they use appropriate strategies for finding, critically
- evaluating, validating and verifying information, e.g. using different keywords, skim reading to check relevance of information, cross checking with different websites or other non ICT resources?
- Can they use knowledge of the meaning of different domain names and common website extensions (e.g. .co.uk; .com; .ac; .sch; .org; .gov; .net) to support validation of information?

Possible Activities					
CYCLE A			CYCLE B		
AUTUMN	SPRING	SUMMER	AUTUMN	SPRING	SUMMER
Through an island enquiry, the children will learn problem solving and logical thinking including combining sequences of instructions and planning a solution to a problem using decomposition (e.g. developing a computer game, creating a website) using Scratch. E-safety – children will learn to select and use appropriate communication tools to solve problems by collaborating and communicating with others within and beyond school.	The children will build their knowledge of creative content, including listening, downloading, producing and uploading their own content, manipulating sounds using audio editing software, incorporating music into different programmes, making simple edits to films and creating a homepage. E-safety - understand they should not publish other people's pictures or tag them on the internet without permission.	The children will improve their digital literacy by conducting a video chat with someone else within school and learning how to conduct a key word search effectively in a search engine. They will learn how to find appropriate information on websites and how to download a document and save it to a computer. E-safety – children will learn to understand that some material on the internet is copyrighted and may not be copied or downloaded.	The children will learn to explain how an algorithm works and to detect and correct errors in a programme. E-safety – Children explore the positive and negative impact of the use of technology in their own lives and those of their peers and family. The children will learn to design, write and debug their own computer control application using scratch. E-safety – children will select and use appropriate communication tools to solve problems by collaborating and communicating with others within and beyond school.	Children will have the opportunity to create a multimedia presentation according to a specific audience. E-safety - Children will be exposed to a range of terms and conditions when using websites, for example: they will learn about terms and conditions of web pages, the age limits and why they are there and about data sharing and ownership of data.	The children will learn to use search engines effectively. They will also learn to confidently choose the correct page set-up when creating a document and learn to use formatting tools confidently. E-safety – Children will explore the potential consequences of posting content online and the difficulty in removing posts