What is Computing?

How can you use, work with and learn from technology?

Our Subject Leader's Policy & Guide

Intent For Our Computing Curriculum

Vision For Computing

At Mayfield we believe computing is a crucial part of children's learning, as technology is now essential to navigating our present world and innovating for the future. We therefore need to create aspiration in this area through the interesting outcomes we plan and the detail in the content itself. We have created a scheme of work for computing as a precisely sequenced curriculum that breaks learning into tight, smaller units, with appealing outcomes, that become progressively more complex and challenging over time whilst recognising the importance of using previous learning. Our scheme ensures that pupils meet the end of Key Stage attainment targets outlined in the National Curriculum. Across our range of units, children master content related to computer science, such as writing algorithms, using logical reasoning to explain how algorithms work and debugging algorithms that do not meet the intended purpose. Children also learn content related to information technology such as how to use search technologies effectively, how to navigate information online and how to collect, evaluate and present data and information via multimedia and data handling. Within digital literacy learning, we ensure that children are equipped with the tools to stay safe online.

In conjunction with our PSHE and RSE curriculum, our computing curriculum also meets the objectives of the **DfE's *Education for a Connected World* framework**. This guidance was created to help equip children for life in the digital world, including developing their understanding of appropriate online behaviour, being discerning consumers of online information, copyright issues and healthy use of technology. We place a strong emphasis on e-safety through termly online safety units, regular retrieval of online safety knowledge within lessons, regular whole school star safe assemblies and communication with parents and carers at home. Our curriculum teaches children the knowledge, understanding and skills they need to balance the advantages offered by technology with a critical awareness of their own and other's online behaviour. We equip every child with effective strategies for staying safe and making a positive contribution online.

How We Plan For, And Teach, Computing

The Mayfield **'I Dream Of Being…'** scheme of work is designed around the **three broader strands or disciplinary concepts referenced in the National Curriculum: computer science, information technology and digital literacy**. From early years onwards, children visit knowledge and skills in **five key substantive concepts linked to these three strands**: **computer systems and networks**, **programming**, **creating media**, **data and information** and **e-safety**. The route through the curriculum ensures that prior knowledge and skills are revisited to ensure retention in long-term memory and built upon to develop increasingly sophisticated understanding in a meaningful context.

Computing is **planned to visit the three substantive concepts of**: **programming**, **creating media** and **data and information** each year in their own planned termly units. We see **computing systems and networks** differently as we believe this forms a more central spine that should recur constantly across the year. We therefore do not plan specific units within the year, but insist upon revisiting a specific identified aspect at the start of all sessions across that school year e.g. emailing, alongside embedding through frequent, short, sharp recaps ad practice with sensible highlighting where necessary. This is our preferred approach for this concept as we don't believe it forms a knowledge base without this continual revisiting and practice.

E-safety is taught through explicit planned sessions at the start of each unit, through whole school online safety assemblies and revisited at the necessary points of learning within each unit.

Computing is taught in every half-term of the year. Most sessions take place in our **Research Room** which is equipped with a class set of laptops and has been newly designed as a specific themed computing base for school. Some computing lessons take place in the base classroom with children accessing a range of devices such as Bee-Bots or iPads. Computing lessons at Mayfield incorporate the following elements: retrieval practice; explicit teaching of new vocabulary; teacher modelling and questioning and a range of learning tasks leading towards a central, purposeful outcome - some independent and some undertaken in partnerships. **Knowledge Mats** for each unit support children to build a foundation of factual knowledge by encouraging recall of key facts and vocabulary - these are designed to be shared with families at home.

Each unit of learning has a teaching **Concept Guide** created to develop excellent subject knowledge and support teachers' ongoing professional development in addition to ensuring progression of knowledge and the need to revisit key messages. All teachers at Mayfield are robustly supported to have strong subject knowledge across the computing curriculum and to know how new learning builds on prior understanding and towards future knowledge and skills. The **Computing Leader** is central to this process via their Concept Guides and their practical support and training for class teachers and supporting adults through school. Mayfield has identified a **Computing Concept Support Teaching Assistant** who is available as a constant classroom aide for children and adults at the point of learning.

Computing's presence is maintained through these adult leads, the profile of reward, achievement and celebration through the school year and through the role of **Student Subject Champions** identified across school to provide feedback and consider achievement through a learner's eye. The environment maintains a consistent presence for computing across school - recognising the value we place upon computing achievement and future aspiration. Computing continues via our enrichment, wider curriculum opportunity: **Computer Club** which runs across the year. Rewards have a specific eye upon personal progress rather than summative attainment.

Intent For Our Computing Curriculum

How We Assess Computing Learning

Teachers continually evaluate children's learning through both formative and summative assessment opportunities. In each lesson, teachers ensure children are assessed against the learning objectives and subsequent planning and lesson adaptation is responsive to gaps and misconceptions. **Essential Questions** are prompted and carefully positioned to aide teachers with this. Each unit has a **quiz** and **self-quiz** opportunity to assess the retention of new knowledge and vocabulary. The impact of our computing curriculum can be seen in projects that children create as well as presentations created as digital content. Programs that children write codes for are saved digitally and accessed by teachers to ensure achievement of learning objectives. Children have the opportunity to self-assess the content they have created, as well as peer-assess. In each year group, children use previously learned skills and apply them to new software, media and coding programs.

Summative judgements are also made using the **Key Milestones Document**. At the end of the year, class teachers use the children's recorded work and assessments to make a judgement as to whether each child is working at the expected standard. **Concept Challenge Maps (Schema)** are available as an assessment and knowledge tool within each concept area to assess whether the children are making and retaining links between the units studied over longer periods of time. We use **Big Episode Event Posters** to aid memory retention. The most frequently used strategy is our **Brain Gym** opportunities which are devised to hold some of the activities highlighted above but above all else as a planned opportunity for daily review. This aims to strengthen the connections between what the children learn and such recall then frees that working memory for the problem solving and creativity to come. Our pupils leave Mayfield equipped with a range of knowledge and skills that enable them to succeed in their secondary education and be active participants in the digital world.

How We Adapt Learning, & Record Outcomes, In Computing

The Computing Leader has created **Concept Guides** to assist with progression and knowledge in each subject. They act as a central support for short-term planning and are created in a format that allows for adaptation and subsequent use with children as/if required. Above all they provide a spine for teachers and supporting adults that should then be personalised, adapted and differentiated to meet the starting point needs of the children in each class.

Ways of demonstrating progress and outcomes must be adaptable to suit the needs of learners and the requirements of the subject. Therefore each subject has its own bespoke way of gathering evidence from learners - **otherwise recording work becomes a barrier to learning rather than a chance to celebrate children's achievements and specialist skills and knowledge in areas where they may otherwise excel**.

In computing, children's work is gathered in:

Computing Big Books (Per Cohort) & Children's Digital Network Portfolio of Work

N A V I G A T E

Computing @ Mayfield

DISCIPLINARY CONCEPTS	COMPUTER SCIENCE		INFORMATION TECHNOLOGY		DIGITAL LITERACY		**DISCIPLINARY CONCEPTS**
SUBSTANTIVE CONCEPTS	E-SAFETY	DATA AND INFORMATION	PROGRAMMING	CREATING MEDIA	COMPUTER SYSTEMS AND NETWORKS		**SUBSTANTIVE CONCEPTS**
LEARNING EPISODES	EARLY YEARS I wonder...if my plant will grow?/...if everyone lives near the sea?/...what changes in Autumn, Winter, Spring, Summer						**LEARNING EPISODES**
	YEAR 1: AUTUMN First Programming	YEAR 1: SPRING Digital Images	YEAR 1: SUMMER **Introducing Data**	YEAR 2: AUTUMN Modifying Images	YEAR 2: SPRING Displaying Data	YEAR 2: SUMMER Algorithms & Loops	
	YEAR 3: AUTUMN Applying Algorithms & Loops	YEAR 3: SPRING Creating Media	YEAR 3: SUMMER Comparing Databases	YEAR 4: AUTUMN Using Spreadsheets	YEAR 4: SPRING Problem Solving & Applying Media	YEAR 4: SUMMER Creating & Controlling A Storyboard	
	YEAR 5: AUTUMN Adapting Codes	YEAR 5: SPRING Transmit & Transfer Data	YEAR 5: SUMMER Stop Motion	YEAR 6: AUTUMN Skills Showcase	YEAR 6: SPRING Skills Showcase	YEAR 6: SUMMER Skills Showcase	

E-Safety & Computer Systems & Networks are planned into separate project units. See overview on following grids.

'I Dream Of Being'….created by us to meet the needs of our children, create aspiration and deliver our core intention.

I Dream of Being… Mayfield Primary School Computing Curriculum Long-Term Overview

	Autumn	Spring	Summer
EYFS **Computing Systems & Networks Focus:** *What Is A Computer? Name Key Parts*	At the heart of the Characteristics of Effective Learning in the Early Years Foundation Stage lie curiosity, creativity and problem-solving. Our pedagogy supports children to develop these dispositions by interacting with the rich provision around them. In turn, these dispositions lay the foundation for their journey into computing. Children are also given opportunities, time (and encouragement where needed) to explore how things work mechanically. This supports children to develop the computational and logical thinking they require for future learning in computer science. Pulleys, cogs, marble runs, jigsaw puzzles, lego and alternative, larger building materials, water wheels and wind up toys are part of the rotated and enhanced provision and allow children to experience cause and effect in its simplest form, as well as develop skills in design, logical reasoning, problem solving and sequencing in these contexts which support computational thinking. Further to this, children learn the very basics of **programming** (e.g. through fine motor work on iPads), creating media and **e-safety**. Children use our **'I Wonder'** statements to engage in the creating, and then manipulation, of photographs linked to **'I Wonder…if my plant will grow?'** and **'I Wonder…if everyone lives near the sea?'** They also learn that information relating to our **'I Wonder'** plants, the seaside, and what changes in Autumn, Winter, Spring and Summer statements can be found on the internet. Whilst they start their digital literacy learning as they begin our **whole-school e-safety programme**.		
Year One **Computing Systems & Networks Focus:** *Improving Mouse Skills*	**Toy Story: First Programming** Introducing programming by exploring remote control cars/Bee-Bots and how these can be controlled with simple instructions and by exploring its functions.	**St Annes in Bloom: Digital Images** Taking and editing photos. Searching for, and adding images to, a project. Using paint tools to create a complete image linked to St Annes in Bloom and explaining the use of colour and why they made specific choices.	**Travels & Tales: Introducing Data** Learning what data is and the different ways it can be represented. Learning why data is useful and the ways it can be gathered and recorded. Representing travel heroes data in different ways using objects and technology.
Year Two **Computing Systems & Networks Focus:** *Word Processing*	**The Gunpowder Plot: Modifying Images** Continuing to develop work with images by modifying and enhancing existing ones to communicate The Gunpowder Plot for a wider audience, showing small changes between images to create a story telling sequence in a storyboard style.	**Desert Island Champions: Displaying Data** Learning how data is collected, used and displayed in the context of scientists working on an uninhabited island. What climatic data would need to be gathered to understand living conditions and dangers? Design a display showing everything that sensors could monitor on the island.	**Kings, Queens & Castles: Algorithms & Loops** Developing an understanding of what algorithms are, how to program them and how they can be developed to be more efficient, including the notion of 'loops' - using the idea of working items in a castle.
Year Three **Computing Systems & Networks Focus:** *Networks, The Internet & Websites*	**Early Britain: Applying Algorithms & Loops** Using our understanding from Year 2, by applying this to Micro:Bits in order to create moving images for an invasion route in an animated, game style inspired by the Roman Legionary movement across Britain incorporating a loop in the program.	**The Sutton Hoo Discovery: Creating Media** Developing recording skills through the creation of a mock podcast from the National Trust Sutton Hoo discovery site showing awareness of their purpose and potential audience including effects and transitions between sections.	**Egyptian Facts: Comparing Databases** Learning about records, fields and data - what those terms mean and how they can be sorted and filtered on a spreadsheet. Comparing the benefits of paper and computerised databases during these studies.
Year Four **Computing Systems & Networks Focus:** *Emailing*	**Norman Conquest: Using Spreadsheets** From information about the Norman invasion and their strategic movements:, use a spreadsheet to gather and store data as well as take readings from the data. Then follow a simple line of enquiry using the data on the spreadsheet.	**The Power and The Rose: Problem Solving & Applying Media** The children will ultimately create a Powerpoint quiz demonstrating their knowledge relating to Tudors. The computing brings together all aspects of media studied thus far including insert pictures, sound, animations and hyperlinks to complete the project. This also requires the use of new functions to solve problems relating to the purpose of the quiz.	**Gods & Legends: Creating & Controlling A Storyboard** Use Code Chimp to create an animation for a Greek myth storyboard. Coding movements of characters onto a background. Revisiting previous key features studied and applying into this more complex and sustained storyboard context with more interweaving features. **This unit links to, and feeds into, Adapting Codes.**
Year Five **Computing Systems & Networks Focus:** *Search Engines*	**Georgian Directions: Adapting Codes** Use Micro:Bits to create a sequence of moving Georgian images **building upon the Gods and Legends storyboards from the previous term.** This unit involves the use of the Micro:Bit technology with a focus upon their potential for adaptation in order to create more complex and challenging directions and involving more extensive debugging.	**The Amazon Rover: Transmit & Transfer Data** Use Micro:Bits as a data logger to take readings from our region and compare results to those in the contrasting, remote climate region. Then moving on to consider how rovers such as the Mars Rover transmit and transfer climate data and how this is interpreted by scientists.	**Morphing Into Reality: Stop Motion** The children are introduced to the notion of moving images to create an effect, building upon their still image work from previous units. Determining again their purpose and audience, children will create a short TV film for a young audience using what they have learned so far alongside the new stop motion skills.
Year Six **Computing Systems & Networks Focus:** *The History, The Present, The Future: Computer Evolution*	**The Good Tank Guide: Skills Showcase - Text & Multimedia** Building upon the *Computing Systems & Networks* focus from Year 5, create a step by step guide using Publisher to searching for WW2 tanks. Bringing together all previous multimedia learning and works **in a skills showcase unit.** This includes the potential for the deployment of stop motion embedded within the guide using QR codes.	**Modern Olympic Heroes: Skills Showcase - Handling, Using and Understanding Data** Olympic Records: Using a database, gather extensive records relating to Olympics medal tally's for leading nations since 1936. Displaying data in a range of differing graphs and charts using 2investigate. Applying learning from data units for final outcome.	**Bring Me Sunshine: Skills Showcase - Final Control** Building on programming from the previous term, the children will apply their knowledge of coding with Micro:Bits to code sensors to light their theatre façade. They will use additional Micro:Bits to code music appropriate for the theatrical theme. Revisiting key coding skills while developing new skills in the form of music to create more complex codes while running simultaneously.

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I DREAM OF BEING....MAYFIELD COMPUTING & PSHE & RELATIONSHIPS STRAND 1 CURRICULUM: ONLINE/E-SAFETY YEARLY OVERVIEW

	AUTUMN	SPRING	SUMMER
EYFS	AUTUMN 1 To identify computers in everyday lives. To discuss how computers make our lives easier. AUTUMN 2 To discuss what can be done online. Discuss how to stay safe online.	SPRING 1 Children are aware that they can use the internet to play and learn supported by a trusted adult/teacher. SPRING 2 Children begin to understand the difference between real and online experiences.	SUMMER 1 Children know that they can use the Internet to communicate with family and friends. SUMMER 2 To begin to understand the importance of keeping information private and how this might be done.
YEAR 1	AUTUMN 1 Children understand that they can find a range of information on the internet. AUTUMN 2 Children are able to navigate age appropriate website.	SPRING 1 Children know what to do if they find something inappropriate online. SPRING 2 Children know that the Internet can be used to communicate with other people.	SUMMER 1 Children know what is meant by personal information and develop awareness of why it is special. SUMMER 2 Children to know what a digital footprint is and how this can impact on our safety online.
YEAR 2	AUTUMN 1 Children use the internet purposefully to answer specific questions. AUTUMN 2 Children know that not everything they encounter on the internet is true.	SPRING 1 Children know the difference between communicating via email and online in a discussion forum. SPRING 2 Children are aware of the different forms of online communication (email, forums, instant messaging and social networking sites) and find out about their associated risks.	SUMMER 1 Develop awareness of relevant e-Safety issues and understand that personal information is unique to them. SUMMER 2 Identify characteristics of people who are worthy of their trust.
YEAR 3	AUTUMN 1 Children develop strategies for staying safe when using the Internet. AUTUMN 2 Children to use the Internet to undertake independent and appropriate research and attempt to distinguish between fact and fiction.	SPRING 1 Children begin to use a range of online communication tools, such as forums, email and polls in order to formulate, develop and exchange ideas. SPRING 2 Children develop awareness of online protocols, in order to stay safe on the web.	SUMMER 1 Children safely use the Internet for research and follow lines of enquiry. SUMMER 2 Children understand the function of a search engine and the importance of using correct search criteria.
YEAR 4	AUTUMN 1 Children use the internet as a resource to support their work and begin to understand plagiarism. AUTUMN 2 Children know that not everything they find on the Internet is true and know what to do if they find something they are uncomfortable with.	SPRING 1 Children use a range of communication tools to collaborate and exchange information with others, e.g. email, blog, forums. SPRING 2 Understand and abide by the school's acceptable use policy.	SUMMER 1 Children are aware of the need to develop a set of online protocols in order to stay safe online. SUMMER 2 Children develop awareness of relevant e-Safety issues.
YEAR 5	AUTUMN 1 Children develop their online set of protocols in order to keep safe online. AUTUMN 2 Children recognise inaccuracy and bias on the web and evaluate websites for their validity.	SPRING 1 Children use online tools to exchange information and collaborate with others within and beyond their school and begin to evaluate their effectiveness. SPRING 2 Children understand the potential risks of providing personal information in an increasing range of online technologies both within and outside school.	SUMMER 1 To create a strong password and the importance of keeping it private. To know to use a different password for different sites. To know not to use predictable information about them as their password. SUMMER 2 To customize privacy settings and know the importance of keeping settings private e.g., location services.
YEAR 6	AUTUMN 1 Children confidently and competently use the Internet as a tool for research and critically evaluate websites for their use. AUTUMN 2 Children know that not all information they find on the Internet is accurate or unbiased and develop strategies for identifying the origin of a website.	SPRING 1 Children are aware of copyright issues and know that not all resources they find on the Internet are legal to use or copy (even if sources are acknowledged) SPRING 2 Children select appropriate tools to collaborate and communicate confidently and safely with others within and beyond their school.	SUMMER 1 Evaluate their use of technology including the use of email, social networking, online gaming and mobile phones and consider how they present themselves online. SUMMER 2 To discuss different ways to respond to bullying. To interpret emotions behind texts and messages.

Intent For Our Computing Curriculum

An Awareness Of Year 7 Coverage & Direction

E-SAFETY	DATA & INFORMATION	PROGRAMMING	CREATING MEDIA	COMPUTER SYSTEMS & NETWORKS
Pupils submit an Online Safety Poster where their Online Safety, presentation and Publisher skills are self – assessed with teacher comment.	Unit covers binary, images and storage, steganography and Boolean operators. Assessed by a test, formally marked and given a standard.	Block coding in Scratch and an introduction to Computational thinking. Self -Assessed on quiz structure/design and Scratch skills. Unit covers binary, images and storage, steganography and Boolean operators. Assessed by a test, formally marked and given a standard.	Short unit to introduce pupils to 3d design and animation to support future KS3 units.	This unit is in an introduction to the platforms and Microsoft Applications pupils will use throughout their time here. It also includes 3 lessons of CATs. Unit covers binary, images and storage, steganography and Boolean operators. Assessed by a test, formally marked and given a standard.

A Computing Vocabulary

A core **Computing Glossary** has been created for the children across school. The vocabulary is progressive from EYFS onwards and at all times retains vocabulary previously introduced. We have chosen this language based upon the perspective of being a historian considering the broader concepts and skills ahead of 'theme specific terms'. The Glossary is contained within each Knowledge Guide and referred to throughout. These are also present around the **Computing Stations** in the learning spaces.

Unit based computing terminology is highlighted within the body of each Concept Guide and prompts adults to discuss this new terminology linked to the concept being studied at the appropriate time. **It is not expected** that these terms are permanently added to the vocabulary for computing, although we clearly aspire for the children to hold onto terms in order to aid their ability to discuss units across their studies.

It is expected that the children maintain and use their Computing Glossary above all else.

The Computing Glossary can be downloaded separately in PDF form.

Here are examples of the two kinds of vocabulary we have identified.

Computing Glossary Vocabulary: Image, Debug

Unit Vocabulary: Micro:Bit, Accelerometer

Subject Leader Concept Guides

The Computing Leader has created Concept Guides to assist with progression and knowledge in each subject. They act as a central support for short-term planning and are created in a format that allows for adaptation and subsequent use with children as/if required. Above all they provide a spine for teachers and supporting adults that should then be personalised, adapted and differentiated to meet the starting point needs of the children in each class.

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