

<p><b>Vision</b></p> <p>The development of computing is changing on a daily basis at home, in the workplace and in the wider community. The impact it has on the lives of individuals continues to grow and it is essential that our pupils can maximise its opportunities and understand its effects. Our curriculum teaches the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Computing also ensures that pupils become digitally literate - are 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.</p>
<p><b>Our learning aims (Taken from National Curriculum):</b></p> <p>In <b>Key Stage 1</b> children will learn to:</p> <ul style="list-style-type: none"><li>• understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li><li>• create and debug simple programs</li><li>• use logical reasoning to predict the behaviour of simple programs</li><li>• use technology purposefully to create, organise, store, manipulate and retrieve digital content</li><li>• recognise common uses of information technology beyond school</li><li>• 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</li></ul>
<p>In <b>Key Stage 2</b> children will learn to:</p> <ul style="list-style-type: none"><li>• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li><li>• use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li><li>• use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li><li>• 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</li><li>• use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li><li>• 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</li><li>• use technology safely,</li></ul>

This Computing progression map details the skills and knowledge children at both our schools aim to acquire to aspire, achieve, and thrive in computing in the 21<sup>st</sup> century. The Computing curriculum does not prescribe anything for EYFS but EYFS learning goals do have relevant objectives that can be considered as Computing skills.

The Computing Curriculum can be divided into three inter-related strands:

**Computer Science** is the coding side of the computing curriculum. Pupils need to understand what algorithms are – this is the basis of what they need to know in order to write computer programs. Each programming language has its own vocabulary and grammar but they all follow the same type of logic.

**Information Technology** This strand of the curriculum equates to what was most of the areas from the old ICT scheme of work. Most of it can be covered by using technology to support other subject areas though it may be necessary to teach some discrete skills.

#### **Digital Literacy**

Children need to be able to use technology safely. They need to keep their personal information private and treat other people with respect. If something goes wrong or they see something they don't like they should know what to do and where to go for help. As children get older they need to know about how to use technology responsibly. As well as thinking about how their online behaviour affects others they need to be aware of legal and ethical responsibilities, including respecting copyright and intellectual property rights, keeping passwords and personal data secure and observing terms and conditions for online services. They need to understand the main risks relating to:

Content – being exposed to illegal, inappropriate or harmful material

Contact – being subjected to harmful online interaction with other users

Conduct – online behaviour that increases the likelihood of, or causes, harm

Children should understand an age appropriate version of the school's Acceptable Use Policy. E-Safeguarding should link with the school's general child protection policy and should not be seen as a separate issue.

## Computer Science

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"> <li>• Repeat an action with technology to trigger a specific outcome.</li> <li>• Recognise the success or failure of an action.</li> <li>• Follow simple instructions to control a digital device.</li> <li>• Recognise that we control computers.</li> <li>• Input a short sequence of instructions to control a device.</li> </ul>	<ul style="list-style-type: none"> <li>• Recognise that computers don't have a brain.</li> <li>• Explain that we control computers by giving them instructions.</li> <li>• Create a simple program e.g. to control a floor robot.</li> <li>• Create a simple algorithm.</li> <li>• Predict the outcome of a simple algorithm or program.</li> <li>• Explain what an algorithm is – a sequence of instructions to make something happen.</li> <li>• Recognise that the order of instructions in an algorithm is important.</li> <li>• Debug an error in a simple algorithm or program e.g. for a floor robot.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain that computers have no intelligence and we have to program them to do things.</li> <li>• Create a program with multiple steps e.g. to control a floor robot.</li> <li>• Predict the outcome of an algorithm or program with multiple steps.</li> <li>• Recognise that the instructions in an algorithm need to be clear and unambiguous.</li> <li>• Identify and correct errors in a given algorithm or program and recognise the term debugging.</li> <li>• Explain what an algorithm is, and that when inputted on a computer it is called a program.</li> <li>• Plan out a program by creating an algorithm, and evaluate its success.</li> </ul>	<ul style="list-style-type: none"> <li>• Predict the outcome of a block or text based program</li> <li>• Successfully modify an existing program, e.g. change background, number of times things happen.</li> <li>• Identify repeated steps in a program or algorithm.</li> <li>• Create examples of algorithms containing count-controlled loops.</li> <li>• Use a count-controlled loop (e.g. repeat 3 times) to make a program more efficient.</li> <li>• Recognise that we can create an algorithm to help plan out a program.</li> <li>• Recognise a forever loop in a program or algorithm.</li> <li>• Use a forever loop in a program to keep something happening.</li> <li>• Identify errors in a block or text-based program and correct them.</li> <li>• Recognise that different inputs can be used to control a program.</li> </ul>	<ul style="list-style-type: none"> <li>• Create a program using a range of events/inputs to control what happens.</li> <li>• Recognise that we can decompose a problem into smaller parts to help solve it.</li> <li>• Explain when to use forever loops and count-controlled loops, and use them in programs.</li> <li>• Recognise selection in a program or algorithm.</li> <li>• Use selection in algorithms in programs to alter what happens when a condition changes, e.g. if...then...</li> <li>• Design a program for a purpose. Decompose into parts and create an algorithm for each one.</li> <li>• Recognise common mistakes in programs and how to correct them.</li> </ul>	<ul style="list-style-type: none"> <li>• Name a range of sensors in physical systems.</li> <li>• Recognise that different solutions may exist for the same problem.</li> <li>• Predict what will happen in a program or algorithm when the input changes (e.g. sensor, data or event).</li> <li>• Use two-way selection in programs and algorithms, i.e. if...then...else...</li> <li>• Recognise variables in a program and what they do.</li> <li>• Create programs including repeat until loops.</li> <li>• Create and use simple variables, e.g. to keep score.</li> <li>• Evaluate a program and make improvements to the code or design accordingly.</li> <li>• Create an algorithm for a physical system containing a sensor.</li> </ul>	<ul style="list-style-type: none"> <li>• Design and program a physical computing system that uses sensors.</li> <li>• Recognise and use procedures (sub-routines) in programs.</li> <li>• Plan out a program in detail, including task, algorithm, code and execution level.</li> <li>• Explain common errors in programs and how to fix them.</li> <li>• Use nested selection statements in a program or algorithm effectively.</li> <li>• Combine a variable with relational operators (&lt; = &gt;) to determine when a program changes, e.g. if score &gt; 5, say "well done".</li> <li>• Recognise key concepts (sequence, selection, repetition and variables) in a range of languages and contexts.</li> </ul>

## Information Technology

Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"> <li>• Operate a digital device with support to fulfil a task.</li> <li>• Create simple digital content, e.g. digital art.</li> <li>• Choose media to convey information, e.g. image for a poster.</li> <li>• Access content in a range of formats, e.g. image, video, audio. - Answer basic questions about information displayed in images e.g. more or less.</li> </ul>	<ul style="list-style-type: none"> <li>• Create digital content, e.g. digital art.</li> <li>• Choose media from a selection (e.g. images, video, sound) to present information on a topic.</li> <li>• Recognise that you can find out information from a website.</li> <li>• Recognise that you can edit digital content to change its appearance.</li> <li>• Select basic tools/options to change the appearance of digital content, e.g. filter on an image / font / size of paintbrush.</li> <li>• Combine media with support to present in</li> <li>• Recognise different forms of digital content, i.e. text, image, video and audio.</li> <li>• Collect simple data (e.g. likes/dislikes) on a topic.</li> <li>• Present simple data using images, e.g. number of animals.</li> <li>• Recognise charts and pictograms and why we use them.</li> <li>• Explain information shown in a simple chart or pictogram.</li> <li>• Modify simple charts/pictograms, e.g. add title, item or labels.</li> <li>• Identify the key features of a chart or pictogram.</li> <li>• Collect data on a topic (eye colour, pets etc.) and present in a pictogram or chart.</li> </ul>	<ul style="list-style-type: none"> <li>• Create simple digital content for a purpose, e.g. digital art.</li> <li>• Recognise that we can use technology to record and playback audio or take and view photographs.</li> <li>• Apply edits to digital content to achieve a particular effect, e.g. emphasise part of a text.</li> <li>• Present ideas and information by combining media, e.g. text and images.</li> <li>• Explain that you can search for information on the internet.</li> <li>• Plan out digital content, e.g. a simple sketch or storyboard.</li> <li>• Identify the common features of digital content, e.g. title, images.</li> <li>• Recognise that we can use different types of media to convey information, e.g. text, image, audio, video.</li> <li>• Identify different forms of digital content, i.e. text, image, video and audio.</li> <li>• Recognise charts, pictograms and branching databases, and why we use them.</li> <li>• Identify an object using a branching database</li> <li>• Recognise an error in a branching database.</li> <li>• Create a branching database using pre-prepared images and questions</li> <li>• Identify the features of a good question in a branching database.</li> <li>• Independently plan out and create a branching database.</li> <li>• Evaluate a given branching database and suggest improvements.</li> </ul>	<ul style="list-style-type: none"> <li>• Present ideas and information by combining media independently, e.g. text and images.</li> <li>• Design and create simple digital content for a purpose/audience, e.g. poster.</li> <li>• Edit digital content to improve it, e.g. resize text.</li> <li>• Identify the features of a good piece of digital content.</li> <li>• Explain why we use technology to create digital content.</li> <li>• Recognise why we use different types of media to convey information, e.g. text, image, audio, video.</li> <li>• Recognise charts, pictograms and databases, and why we use them.</li> <li>• Present information using a suitable chart</li> <li>• Explore a record card database to find out information.</li> <li>• Use filters in a database to find out specific information.</li> <li>• Name the key parts of a database, e.g. record, field, search.</li> <li>• Answer questions about information in a database.</li> <li>• Name some benefits of using a computer to create charts and databases.</li> <li>• Recognise that search engines store information in databases.</li> </ul>	<ul style="list-style-type: none"> <li>• Collect, organise and present information using a range of media. - Design and create digital content for a specific purpose, e.g. poster, animation.</li> <li>• Edit digital content to improve it according to feedback.</li> <li>• Identify the features of a good piece of digital content and apply these in own design.</li> <li>• Explain the benefits of using technology to present information.</li> <li>• Know where to find copyright free content, e.g. creative commons images.</li> <li>• Collaborate with peers using online tools, e.g. blogs, Google Drive, Office 365, if available.</li> <li>• Draw conclusions from information stored in a database, chart or table.</li> <li>• Design a questionnaire and collect a range of data on a theme.</li> <li>• Choose appropriate formats to present data to convey information.</li> <li>• Recognise that school computers are connected together on a network.</li> <li>• Recognise that the Internet is made up of computers and other digital devices connected together all around the world.</li> <li>• Know that you use a web browser to access information stored on the internet.</li> <li>• Appreciate that you need to use specific software to work.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and use appropriate hardware and software to fulfil a specific task.</li> <li>• Remix and edit a range of existing and their own media to create content.</li> <li>• Consider the audience when designing and creating digital content.</li> <li>• Recognise the benefits of using technology to collaborate with others</li> <li>• Identify success criteria for creating digital content for a given purpose and audience.</li> <li>• Evaluate their own content against success criteria and make improvements accordingly</li> <li>• Explain the difference between data and information.</li> <li>• Appreciate that different programs work with different types of data, e.g. text, number, video.</li> <li>• Explain the difference between the Internet and the World Wide Web.</li> <li>• Know the difference between a search engine and a web browser.</li> <li>• Explain the basics of how search engines work, and that different search engines may give different results.</li> <li>• Perform complex searches for information using advanced settings in search engines. - Recognise the benefits and risks of sharing data online.</li> </ul>	<ul style="list-style-type: none"> <li>• Select, combine and remix a range of media to create original content.</li> <li>• Consider all steps of the design process when creating content (e.g. identify problem, plan, create, evaluate, share.)</li> <li>• Identify the most effective tools to present information for a specific purpose.</li> <li>• Explain the benefits of using technology to collaborate with others.</li> <li>• Evaluate existing digital content in terms of effectiveness and design</li> <li>• Recognise what a spreadsheet is and what it is used for.</li> <li>• Explain the difference between physical, mobile and wireless networks.</li> <li>• Use simple formulae in a spreadsheet to find out information from a set of data.</li> <li>• Collect data for a purpose and plan out a spreadsheet to present it effectively, using relevant formulae.</li> <li>• Produce graphs from data in a spreadsheet to answer a question.</li> <li>• Analyse and evaluate data and information in a spreadsheet, chart or database.</li> <li>• Recognise that poor quality data leads to unreliable results.</li> </ul>

## Digital Literacy

Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"> <li>• Are aware that some online content is inappropriate.</li> <li>• Are aware that information can be public or private.</li> <li>• Know to tell an ap</li> </ul>	<ul style="list-style-type: none"> <li>• Use a simple password when logging on, where relevant.</li> <li>• Explain why we use passwords.</li> <li>• Recognise examples of personal information e.g. name, image.</li> <li>• Know who to tell if concerned about content or contact online.</li> <li>• Recognise that digital content belongs to the person who created it.</li> <li>• Talk about their use of technology at home</li> </ul>	<ul style="list-style-type: none"> <li>• Remember a simple password to log onto the computer or a website.</li> <li>• Identify rules for acceptable use of technology in school.</li> <li>• Recognise what personal information is and the need to keep it private.</li> <li>• Recognise that spending a lot of time in front of a screen can be unhealthy.</li> <li>• Recognise that some information found online may not be true.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain why we need to keep our password safe.</li> <li>• Recognise that digital content belongs to the person who first created it, but we can give permission for others to use it.</li> <li>• Recognise when to share personal information and when not to.</li> <li>• Recognise that some people lie about who they are online.</li> <li>• Are aware that games and films have age ratings.</li> </ul>	<ul style="list-style-type: none"> <li>• Remember and use an individual password.</li> <li>• Recognise what kinds of websites are trustworthy sources of information.</li> <li>• Recognise the benefits and risks of different apps and websites.</li> <li>• Recognise that the media can portray groups of people differently.</li> <li>• Can rate a game or film they have made and explain their rating.</li> </ul>	<ul style="list-style-type: none"> <li>• Know where to find copyright free images and audio, and why this is important.</li> <li>• Critically evaluate websites for reliability of information and authenticity.</li> <li>• Demonstrate responsible use of a online services, and know a range of ways to report concerns.</li> </ul>	<ul style="list-style-type: none"> <li>• Explain what makes a strong password and why this is important at school and in the wider world.</li> <li>• Explain how algorithms are used to track online activities with a view to targeting advertising and information.</li> <li>• Know that there are laws around the purchase of games; the production, sending and storage of images; what is written online; and around online gambling.</li> </ul>