Computing knowledge & skills underpin modern life and the 21st Century economy. Children need to build vital confidence, knowledge and understanding of the way technologies work - and how internet-connected systems can be employed - in order to adapt flexibly to ever rapid change over coming years.

Our intent for children’s learning across Computing is mapped into three strands, dividing this broad subject into 3 main areas that build progressively throughout a child’s time in primary education.

***Computer Science;***

***Information Technology;***

***Digital Literacy.***

The Computing objectives of the National Curriculum are used as a starting point for devising our curriculum milestones – the points at which we aim for children to have acquired particular aspects of knowledge, skill and understanding. However, to reflect the ever-growing breadth and importance of the subject, we have widened the scope of such milestones, with the intention that children become equipped with a toolkit of understanding and skills that is fit for secondary education; and for mastering the modern digital world confidently yet safely.

Progression through the curriculum milestones, and wider learning opportunities found within units of work, is based on key items of knowledge and skill being re-visited and expanded upon, allowing children to build solid foundations for their long-term understanding of everything that we might consider to be Computing.

**Computer Science**

A hugely important element of Computing subject knowledge, all children should have an understanding of how modern devices and software operate at code level. Many children are competent consumers of screen-based media and games – we want them to progress to become confident in their understanding of *how* such systems work. We want children to know how algorithms and programs are devised by humans to perform worthwhile functions; that such programs can vary in how they are created; that using programming techniques such as *loops*, *repetition*, *selection* and *variables* allow programs to function efficiently; that *debugging* is a key process for optimising code and making sure it fulfils its purpose.

**Information Technology**

Children must understand the wide range of roles and purposes for technology in the modern world. We need to build awareness, followed by understanding, of the high-tech gadgets and tools that people increasingly use in everyday life. This should include an understanding of the technical processes that occur between devices, now that internet-connected services are a ubiquitous part of leisure and work. Technology has become an integral part of the way video, animation, audio and still images are manipulated and published – children can become incredibly inspired by understanding such processes, while enhancing and enabling modern creative processes. Schools have the ability to let children design, edit, produce, perform and publish, in a seamless way that has never been so easy or accessible – they should take every opportunity to do so.

**Digital Literacy**

The 21st century is infused by technology and powerful cloud-based facilities. Children need to understand the potential of such technologies, and how to interact with such services on a daily basis. The framework includes explicit emphasis on children’s ability to operate devices, including operating multiple apps and typing at speed. Keyboard, touchscreen and touchpad skills are vital pieces of understanding that children must be gradually exposed to at an appropriate level. Such skills are part of a modern toolkit of understanding that enables individuals to communicate and collaborate successfully and skillfully.

*Internet Safety* remains ever important. We know that internet-based services are becoming more regulated over time, as societies interpret the pros and cons of such facilities, and decide how and when individuals – including children who may be further vulnerable to negative outcomes – access and become involved in such services. We need to give children the knowledge to understand when services may not be safe; that contact and content could be inappropriate; that they can look after their bodies and minds while understanding that limits and restrictions on screen-based activities are necessary to stay healthy; that posting pictures or videos to internet-based services may carry considerable risks; that fraud and scams are rife on the internet and to be wise with guarding personal information.

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| Strand | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| ***Computer Science*** | | | | | | | |
| ***Programming, including Controlling***  ***Hardware*** | *I can understand a large task as smaller steps (links to algorithms and decomposition)* | *I can understand and create* ***algorithms*** *(steps or rules as instructions, e.g. how to make a sandwich)*  *I understand that* ***algorithms*** *must be precise and unambiguous* | *I can* ***predict*** *the behaviour of simple programs*  *I can create and run a* ***program*** *(an algorithm or multiple algorithms that can be understood by a computer)*  *I can* ***debug*** *(find and fix a problem) within a simple program* | *I can create a* ***sequence*** *of commands to produce a given outcome*  *I can recognise that the order of commands will produce a different outcome*  *I can control or simulate* ***programmable hardware*** *(e.g. a Sphero robot)* | *I can create a program that uses* ***loops*** *to achieve a particular outcome*  *I can recognise that some programs can be run at the same time (****concurrency****)*  *I can* ***decompose*** *(break into smaller chunks) a programming problem* | *I can use* ***selection*** *in my programs. (Also known as* ***conditionals*** *or* ***If / Then*** *statements). (e.g. if a character moves onto a yellow square, then gain two points)*  *I can create an* ***‘if... then... else...’*** *statement that will result in different outcomes*  *I can explain that instructions in a* ***program*** *will produce specific outcomes*  *I can create and modify a* ***count*** *or* ***event-controlled*** *loop* | *I can identify examples of information that is* ***variable***  *I can use* ***variables*** *of my own creation within my programs*  *I can* ***program*** *and* ***debug*** *multiple functions on programmable hardware (e.g. with a Microbit)* |

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| Strand | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | | Year 5 | Year 6 | |
| ***Information Technology*** | | | | | | | | | |
| ***Knowledge & Understanding*** | *I can talk about technology, using pictures and memory recall*  *I can explore apps on a touchscreen, large interactive screen or laptop device.* | *I can identify examples of* ***technology*** *in the classroom*  *I can place* ***items*** *into groups (e.g. these shapes are all red)*  *I can decide on* ***labels*** *for groups (e.g. these shapes all have four sides)* | *I can identify the major parts of* ***digital devices*** *(e.g. keyboard, screen, power, batteries, touchscreen)*  *I can* ***identify*** *information technology in the school, home, and beyond*  *I can* ***enter data*** *into a computer system*  *I can use a computer to* ***present*** *data*  *I can use a computer to answer questions on data* | *I can identify* ***networked devices*** *around me (e.g. networked printer, wireless laptop)*  *I can identify* ***inputs*** *and* ***outputs*** *of common computing devices (e.g inputs: keys on a keyboard, temperature sensor, tilting a device; outputs: screen display, printer)*  *I can use technology to organise and manipulate* ***digital content***  *I can create questions with yes / no answers to categorise objects*  *I can retrieve information from different levels of a branching database* | *I can recognise that the* ***world wide web*** *is part of the internet*  *I understand that the global interconnection of networks is the* ***internet***  *I can use a digital device to* ***collect data*** *automatically*  *I can choose how often to collect* ***data samples*** | *I can explain that a* ***search engine*** *uses* ***web crawlers*** *to create an* ***index***  *I can explain that a search engine follows* ***rules*** *to* ***rank*** *results*  *I understand that* ***emails*** *and other digital communications can be sent and received from various types of digital device*  *I can choose multiple criteria to* ***search data*** *to answer a given question (****AND and OR****)*  *I can choose which* ***attribute*** *to sort data by to answer a given question*  *I can choose an appropriate graph to visually compare* ***data*** | | | *I can collect data and enter it into a* ***spreadsheet***  *I can recognise that data can be calculated using different* ***operations***  *I can apply a* ***formula*** *to* ***calculate*** *the data I need to answer questions*  *I understand that* ***computer systems*** *transfer information over networks in* ***data packets***  *I understand that* ***connections*** *between computers allow us to work together* |
| ***Multimedia and Sound*** | *I can experience and talk about pictures, video and sound that are viewed through digital devices* | *I can use an* ***app*** *or* ***website*** *to make graphical marks or pictures* | *I can use* ***technology*** *to capture (e.g. with an iPad) and manipulate (position, re-size, rotate) photos*  *I can create and adjust audio using digital technology* | *I can design and create an* ***animation*** *(e.g. stop-frame animation on an iPad)*  *I can recognise that different* ***font styles*** *and* ***effects*** *are used for particular purposes* | *I can plan for a podcast or music production*  *I can* ***record*** *and* ***edit*** *sound using digital technology as part of a podcast or music production*  *I can edit images for purpose*  *I can manipulate and adjust images for a particular purpose* | *I can edit* ***video****, bringing together different media elements (e.g. stills, video, captions and sound) to produce an effective final product*  *I can create a* ***vector drawing*** *that is comprised of lines and shapes of different colours*  *I can* ***resize, duplicate, rotate*** *and* ***align*** *objects in vector drawings*  *I can use* ***grouping*** *and* ***layers*** *in my vector drawing* | | | *I can recognise the common features of a web page*  *I can devise my own web design which contains navigation paths (menus, hyperlinks etc.)*  *I can recognise the difference when working with* ***3D objects*** *in comparison to 2D shapes*  *I can produce a* ***3D model*** *and decide how it can be improved*  *(e.g. using Tinkercad)* |

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| ***Digital Literacy*** | | | | | | | |
| ***Operational Core Skills*** | *I can use hand-eye coordination to operate devices such as touch-screens* | *I can use* ***apps*** *or* ***websites*** *to aid my learning*  *I can* ***save and retrieve*** *work that I have produced (includes* ***auto-save****)*  *I can move a* ***cursor*** *with the trackpad and* ***click*** *on an icon* | *I can* ***type*** *and* ***edit*** *basic text*  *I can use* ***two-finger scrolling*** *on a touchpad*  *I can use the* ***shift key*** *to create capital letters* | *I know how to* ***search*** *for items on the internet*  *I can* ***type*** *confidently and independently*  *I can type* ***basic punctuation*** *correctly within on-screen writing*  *(spaces, commas, full stops, question marks)*  *I can perform a* ***two-finger click or right-click*** *to access additional options* | *I can* ***type*** *to achieve specific goals, including accurate punctuation*  *I can check and correct my spellings digitally*  *I can successfully use multiple* ***apps*** *or* ***web browser tabs*** *at the same time* | *I can edit**and**improve* ***on-screen writing****, including digital thesaurus use*  *I can combine a variety of* ***software*** *(programs that run on computers) to accomplish given goals* | *I can* ***re-order*** *on-screen sentences for clarity, purpose and effect*  *I can* ***type at speed*** *with accurate spelling and correct use of punctuation conventions* |
| ***Self-image and Identity*** | *I know that being on-screen is different to real life.* | *If something happens that makes me feel sad, worried, uncomfortable or frightened I can give examples of when and how to speak to an adult I can trust.* | *I can describe ways in which people might make themselves look different online.* | *I can describe ways in which media can shape ideas about gender.* | *I can explain how my online identity can be different to the identity I present in ‘real life’.* | *I can explain how identity online can be copied, modified or altered.* | *I can explain how I can represent myself in different ways online.* |
| ***Online relationships*** | *I recognise that people can talk to each other using technologies.* | *I can recognise some ways in which the* ***internet*** *can be used to communicate.* | *I can explain some risks of communicating* ***online*** *with others I don’t know well.* | *I can explain how my and other people’s feelings can be hurt by what is said or written online.* | *I can explain what it means to ‘know someone’ online and why this might be different from knowing someone in real life.* | *I can explain how impulsive and rash communications online may cause problems (e.g. flaming, content produced in live streaming).* | *I can demonstrate how I would support others (including those who are having difficulties) online.* |
| ***Online reputation*** | *I can talk about different types of information on the internet, e.g. pictures / text / video.* | *I can describe what information I should not put* ***online*** *without asking a trusted adult first.* | *I can explain how information put online about me can last for a long time.* | *I know who I should ask if I am not sure if I should put something online.* | *I can describe how others can find out information about me by looking online.* | *I can describe ways that information about people online can be used by others to make judgments about an individual.* | *I can describe some simple ways that help build a positive online reputation.* |
| ***Online bullying*** | I know that people can be kind, or might be unkind, online. | I can describe how to behave online in ways that do not upset others | | *I can describe rules about how to behave online and how I follow them.* | I can explain why I need to think carefully about how content I post might affect others, their feelings and how it may affect how others feel about them (their reputation). | I can explain how I would report online bullying on the apps and platforms that I use. | I can identify a range of ways to report concerns both in school and at home about online bullying. |
| ***Managing online information*** | *I can use, talk about or read different on-screen programs, pictures, stories or information.* | *I can identify devices I could use to access information on the internet.* | *I can demonstrate how to navigate a simple webpage to get to information I need (e.g. home, forward, back buttons; links, tabs and sections).* | *I can evaluate digital content and can explain how I make choices from search results.* | *I can* ***analyse*** *information and differentiate between ‘opinions’, ‘beliefs’ and ‘facts’.* | *I can explain why lots of people sharing the same opinions or beliefs online does not make those opinions or beliefs true.* | *I can demonstrate strategies to enable me to analyse and evaluate the validity of ‘facts’ and I can explain why using these strategies are important.* |
| ***Health, well-being and lifestyle*** | *I can talk about the difference between activities that are online or offline.* | *I can explain rules to keep us safe when we are using technology both in and beyond the home.* | *I can create* ***rules*** *for using technology* ***safely*** | *I can identify situations when I might need to limit the amount of time I use technology.* | *I can describe ways technology can affect healthy sleep and can describe some of the issues.* | *I can describe common systems that regulate age-related content (e.g. PEGI, BBFC, parental warnings) and describe their purpose.* | *I can assess and action different strategies to limit the impact of technology on my health (e.g. nightshift mode, regular breaks, correct posture, sleep, diet and exercise).* |
| ***Privacy and security*** | *I can talk about trusting people (e.g. parents, teachers).* | *I can identify some simple examples of my personal information (e.g. name, address, birthday, age, location).* | *I can explain why I should always ask a trusted adult before I share any information about myself online.* | *I can describe simple strategies for creating and keeping passwords private.* | *I can explain how internet use can be monitored.* | *I can explain how many free apps or services may read and share my private information (e.g. friends, contacts, likes, images, videos, voice, messages, geolocation) with others.* | *I can compare and evaluate different methods of online communication* |
| ***Copyright and ownership*** | *I know that work I create belongs to me.* | *I can name my work so that others know it belongs to me.* | *I can recognise that content on the internet may belong to other people.* | *I can explain why copying someone else’s work from the internet without permission can cause problems.* | *When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it.* | *I can demonstrate the use of search tools to find and access online content which can be reused by others.* | *I can recognise the implications of linking to (and using) content owned by other people* |