St. Mark's CE Primary School

Computing

Curriculum Map 2023-2024

Progression in Computing

Computing programme of study: Key stages 1 and 2

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. 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 problem
- 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.

The school curriculum for Computing is divided into 4 different and discrete topics.

1. Digital Literacy
2. Online Safety
3. Programming (Coding)
4. Understanding Technology

The following curriculum map integrates the National Curriculum, the Cambridgeshire Capability Statements, Project Evolve 'I cans' and the Key Learning Intentions built within Purple Mash.

Theme Overview: Digital Literacy

Digital Literacy is the ability to effectively and critically navigate, find, evaluate, summarise, use, create and communicate information using a range of digital technologies. It deals with the appropriate use of technology generated words, images, sounds and motion. Developing digital literacy is increasingly important because it supports learners to be confident and competent in their use of technology in a wide variety of contexts. The inter-related components of digital literacy can and should be developed alongside subject specific knowledge and understanding.

<table>
<tr><th></th><th colspan="2">Early Capability</th><th colspan="2">Middle Capability</th><th colspan="2">Later Capability</th></tr>
<tr><th></th><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th><th>Year 5</th><th>Year 6</th></tr>
<tr><td>National Curriculum</td><td colspan="2">• Use technology purposefully to create, organise, store, manipulate and retrieve digital content</td><td colspan="4">• 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</td></tr>
<tr><td>Capability Statements</td><td colspan="2">With adult guidance, pupils use a range of technology to enhance and present their learning. Within both specific computing lessons and cross curricular contexts, pupils are able to:

· enquire with purpose, accessing digital content such as text, still and moving images, video and audio
· collect data (e.g. numerical, research facts etc.) which they are able to retrieve, store and present as graphs, tables and charts
· present and communicate their learning to others in a variety of ways using text, still images, video and audio, including combining 2 or more of these mediums</td><td colspan="2">With increasing levels of autonomy, pupils are becoming confident and creative users of technology.
Within both specific computing lessons and cross curricular contexts, pupils are able to:

· follow and expand on agreed lines of enquiry, using key words and phrases to effectively access digital content such as text, still images, video and audio
· identify, collect and manipulate different types of data (e.g. numerical, research facts etc.) which they present as information, showing a greater awareness of purpose and audience.
· present and communicate their learning to others in a variety of ways using text, still images, video and audio. They combine digital tools to achieve specific goals and think carefully about the impact on their audience.</td><td colspan="2">Pupils are confident, capable and creative users of technology.

Within both specific computing lessons and cross curricular contexts, pupils are able to:

· create and effectively follow lines of enquiry to support their learning, and are discerning in evaluating digital content they encounter
· identify, collect and analyse different types of data (e.g. numerical, words, images, video etc.) which they manipulate and re-present as information for a variety of audiences and purposes.
· select and make effective use of digital tools to create digital artefacts both under instruction and of their own choosing;
· decide on the most appropriate way to present their learning - thinking about aesthetics, functionality and impact on the user, and responding appropriately.</td></tr>
<tr><td colspan="7">More specific guidance for individual year group teachers can be found in the phase overviews at www.ccc-computing.org.uk</td></tr>
</table>

	Early Capability	Middle Capability	Later Capability
	Year 1/2	Year 3/4	Y5/6
Research	Pupils **explore** and **navigate** around adult chosen / age appropriate **website** which includes text / images / sounds / video. **Relate** what they have found out. They begin to conduct **specific key word searches** using a **child friendly search engine** to **locate exact information** in text / images / sounds / video with the intention of **answering simple / closed questions**.	Pupils can **navigate with purpose** a small, **chosen** collection of age / interest **appropriate texts and websites** to **read**, **discover** and follow widening **lines of enquiry**. **They conduct searches** and **compare results** from **child friendly search engines** to **locate precise facts** and demonstrate **comprehension**. They i**dentify** suitable **key words** and **phrases** to use in own lines of enquiry.	Pupils **select** suitable **search terms** and use to **follow own areas of interest** filtering to show, access and garner information from a **range of media sources**. They start to **cross-reference** information. They q**uestion** and seek to **verify** and determine accuracy including **identification of source**. They create fact-files, **agreeing the information they need in advance** and then **using a variety of sources** (including text, audio, video and books) to track that information down and **check its validity**.
Data Handling (taken from National Curriculum for Maths)	Interpret and construct **simple pictograms**, **tally charts**, **block diagrams** and **simple tables**. Ask and answer simple questions by counting the number of objects in each category and **sorting** the categories by quantity. Ask and answer questions about **totalling and comparing categorical data**. They know what a **spreadsheet program** looks like, and are able to **enter data** into spreadsheet **cells**.	Interpret and present data using **bar charts**, **pictograms** and **tables** Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in **scaled bar charts** and **pictograms** and **tables**. When using a spreadsheet, children are able to use the **totalling tools**. Children are able to use the **symbols more than**, **less than** and **equal to**, to **compare** values. Children begin to learn about **cell references**.	Interpret and present **discrete and continuous data** using appropriate graphical methods, including **bar charts** and **time graphs**. Solve comparison, sum and difference problems using information presented in **bar charts**, **pictograms**, **tables** and other **graphs**. Children add a **formula** to a cell to **automatically** make a **calculation** in that cell. Within the spreadsheet, children **format cells** as **currency**, **percentage**, **decimal** to different **decimal** places or **fraction**, and calculate **averages** using the formulae.	Solve comparison, sum and difference problems using information presented in a **line graph**. Complete, read and interpret information in **tables**, **including timetables**. Children use formulae within a spreadsheet more **efficiently**, mimicking **real-life problems**/scenarios. They are able to create **formulae that use text variables**. Children learn how to **search** for information in a **database**, and **create** a **database** around a chosen topic.	Interpret and construct **pie charts** and **line graphs** and use these to solve problems. Calculate and **interpret the mean as an average**. Children begin to use a spreadsheet to investigate probability, using the formulae to calculate **averages**, including **mean**, **median** and **mode**. Children are able to use data formulae for **percentages** and **max** and **min** numbers. They use a spreadsheet to calculate the **discount** and **final prices** in a sale

Presentations	Pupils use Microsoft's Photostory, 2Publish, and apps such as Puppet Pals and Book Creator (often selected by an adult) to **mix together different media** (such as text and images) to **present what they have learned** and **plan and share their ideas with others**. They are able to **create a photo slideshow – adding text or sound to their photos** and choosing transitions with an adult. Using tablets with them on a school trip, children **record images and sounds** and then use a digital book creator to create a class book back in the classroom.	When presenting what they have learned, pupils **use a wider range of tools:** comic strips, desktop publishers, animation tools etc. to **combine text, images, video and audio** within a presentation – i.e., MS PowerPoint. They use a digital book creator to **make an e-book, including their own artwork, text and a sound recording**. They use a comic strip designer to **record a decomposition** and then use this to write their recount of the experience.	They now **use digital tools much more confidently, choosing just the right tool for the job.** They can, for example, create a range of content using a video editor and then **combine content** using Augmented reality or multimedia tools. They **create a village or school trail** or use these tools to **bring a historical event to life.** They can **confidently move between different apps and programs** to create content.
Communicating (**Must** be linked with work on Online-Safety – Project evolve)	Pupils **send simple messages** to others in their class / year group through a monitored messaging tool. They **actively participate** when the teacher models communicating through, for example, **video conferencing tools** such as E2BN's Flash meeting. Pupils **begin to use messaging tools to ask questions more purposefully**, making sure messages are clear and appropriate. They know what to do if something they receive upsets them. Children **practise typing** with the left and right hand.	Pupils **widen the range of messaging tools they use** to include, for example, **discussion forums** and **blogs**. They write about something exciting or interesting which has happened recently (**such as a current news event or a visitor into school**), keeping personal information private. Within this, children understand how **font size** and **style** can **affect the impact of a text.** They understand how to write a **blog** and a **blog post** and consider the effect upon the **audience** of **changing the visual properties** of the blog.	Pupils should be **much more confident** now at choosing the right tool for the job. They send and receive **attachments via email** / **messaging** tools. They use **blogs**, **forums** and other **collaborative tools** to communicate **safely and respectfully** using a wider range of media e.g. **pictures**, **video**, **audio** (see '*Presentations*'). Pupils communicate appropriately in spaces **within and beyond school systems** (e.g. in the Scratch community) and show an excellent understanding of how to do this **safely** and **responsibly**. Pupils **maintain a blog more frequently**, perhaps to **present their learning** or share something they're personally interested in such as a favourite sport, pet or TV programme. They **comment appropriately on other people's blogs** and contribute to class discussions via **forums** / **noticeboards** / **collaborative tools**.
Audio	Pupils learn how to **make simple audio equipment work**. They begin to **listen to and learn from sounds** embedded in audio books, websites, sound buttons and other tools. Pupils **make their own recordings** using digital devices (microphones, tablets, talking postcards etc.) and **use these recordings purposefully**.	Pupils **download, create and record sounds** and begin to **combine, edit and present** them. This includes learning to, for example, **delete unwanted sections of audio**, or **combine multiple recordings** to create one longer piece. They **begin to understand the impact** different types of music can have on an audience and think about what effect they want to achieve when recording or downloading music.	Pupils **confidently choose when to use audio to enhance their work or present their learning**. They learn how to **digitally manipulate audio** to create a desired effect, including **editing unwanted sections of a recording, copying and pasting sections and digitally manipulating volume**. They use a selection of apps / tools to **create and record their own music tracks and embed them** into other projects such as presentations or films.

Film Making	With adult support, **pupils create films from still photos**, choosing **preferred transition** and similar **basic visual effects**. They **contribute to discussions** about the **choice of audio** to accompany a film and can talk about **how different pieces of music make them feel**. They **use basic film making techniques** to retell familiar stories or those developed as part of a class / group. This includes both **live action filming** and **stop-motion animation**.	Pupils begin to understand the **grammar of film** such as how different **camera distances** and **angles** can **have different impacts on the audience.** They apply what they have learned about the **impact on the audience of different types of music or sound effects** and can digitally **create, record and manipulate** audio accordingly. Pupils can **edit sections of film (live or animated) together**, trimming and adding visual effects or transitions to create a desired effect.	Pupils **combine a range of known film making techniques** confidently and creatively to achieve a specific goal. They think carefully about the **intended effect** of their choices on their **audience** and reflect on whether the desired effect has been achieved, **refining their work** where appropriate. They **use editing techniques creatively** and can confidently use a combination of **visual and audio effects** in their films
Digital Art (Example of progression in Mark Making – other elements also apply)	Pupils progress from the approach in EYFS where they will be encouraged to **discover** and **explore what their fingers can do on, for example, a tablet,** showing enjoyment and ability to talk about what they have done. Pupils **experiment** with how to create a range of effects - **shades**, **patterns** and **results** using different **eTools**.	Pupils **demonstrate** an expanding repertoire of experiments with digital tools exploring **shade, shape, pattern, screen effects, marks and lines.** They can use what they have learned to **respond to specific tasks**, such as creating firework picture. They make effective use of **known techniques** to **create an intended artefact**, **reflecting** on and **refining** their work as appropriate.	Pupils **plan** and **develop**, in a **sustained** way, ideas with **shade, shape, pattern, screen effects, marks and lines** into some finished works of art. Show the **influence of screen drafts/ jottings** to ***tangible*** works of art. Pupils can **explain what works well digitally**, what doesn't and how technology can support artistic development.
	Where practical, it would be good practice to mirror screen based experimentations with *tangible* attempts using comparable techniques and media.		

Theme Overview: Online Safety

"New technologies are integral to the lives of all children, young people and their parents. They inspire children to be creative, communicate and learn. It is essential that children and young people tap into the potential of the digital world if they are to enjoy their childhood and succeed in life. In educating children and young people, we should empower them to learn how to use digital technology responsibly, not simply block what they can access. We must give them the information and skills they need to be digitally literate and savvy users. This enables them to take advantage of the opportunities that new technologies can offer, as well as being able to deal with any risks that arise."

	Early Capability		Middle Capability		Later Capability	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
National Curriculum	• 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.		• Use technology **safely**, **respectfully** and **responsibly**; **recognise acceptable** / **unacceptable behaviour**; identify a range of ways to report **concerns** about **content** and **contact**.			
Capability Statements	Pupils are becoming increasingly aware of **content**, **contact** and **conduct benefits** and **risks**, how to **manage** them safely and where to go for help and support when they have concerns or feel **unsafe**, **worried** or **upset**. They are beginning to develop a better understanding of **their own and others' 'identity'** (including online), the importance of keeping personal information private and of **seeking permission** before sharing. They check with an adult before clicking on pop ups, notifications or dialogue boxes. They increasingly use a range of **digital** devices to **communicate safely and respectfully** online, making links to positive behaviour in the physical world.		Pupils are able to identify a range of **content**, **contact** and **conduct** benefits and risks, describe how to **manage them safely and respectfully** and know where to go for help and support when they have concerns. They can explain what is meant by '**identity**', how this might be represented differently in different situations and why others might **mis-represent their identity**. They develop their understanding of '**trust**' and the importance of being careful about what is shared online and of giving and **gaining consent**. Pupils can describe **positive and negative effects of online activity** / behaviours and begin to understand how to **make safer and healthier decisions**, including considering the appropriateness of games and online content for different ages. Pupils can describe **positive** ways for someone to **interact** with others online and understand how this will positively impact on how others perceive them.		Pupils **identify and manage** the **benefits** and **risks** of a range of online activities in terms of **content**, **contact** and **conduct** to ensure they are **safe**, **respectful** and **responsible** online. They know how to **report concerns**, **seek support** for themselves and others and **persist** until they get the help they need. Pupils **make responsible choices** about their own **online identity** and consider the potential impact of this on their **digital footprint**. They understand that online identities can be **copied** or **modified** and some of the possible implications of this. They can describe times when they might **responsibly share personal information** (including payment details), the importance of seeking **permission** and the need for strong **passwords**. They can describe ways technology may impact their own and others' **physical and mental wellbeing** (positively and negatively), understand their **responsibilities** in regard to this and can suggest a range of positive strategies to limit the negative impact of technology and online behaviours.
	The above online safety statements have been created with reference to the Cambridgeshire PSHE Digital Lifestyles curriculum (2020) and Education for a Connected World. *More specific guidance for teachers can be found on the Project Evolve Portal, or at www.theictservice.org.uk/primary-computing*					

	Early Capability		Middle Capability		Later Capability	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Self-Image and Identity	Children are able to recognise that there may be people online who could make someone feel **sad**, **embarrassed** or **upset**. Children are able to give examples of when and how to speak to an **adult** Children are able to **trust** and how they can **help**.	Children are able to explain how other people may look and act differently **online** and **offline**. They give examples of issues online that might make someone feel sad, **worried**, **uncomfortable** or **frightened**. They give **examples** of how they might get help.	Children are able to explain what is meant by the term '**identity'**. Children are able to explain how people can **represent themselves** in different ways online. They explain ways in which someone might **change their identity** depending on what they are doing online.	They explain how my **online identity** can be different to my **offline identity**. Children are able to describe positive ways for someone to interact with others online and understand how this will **positively impact** on how others perceive them. They explain that others online can **pretend** to be someone else, including my friends, and can suggest reasons why they might do this.	They explain how identity online can be **copied**, **modified** or **altered**. Children are able to demonstrate how to make **responsible choices** about having an online identity, depending on context.	They identify and critically evaluate online content relating to **gender**, **race**, **religion**, **disability**, **culture** and other **groups**, and explain why it is important to challenge and **reject inappropriate** representations online. Children are able to describe issues online that could make anyone feel sad, worried, uncomfortable or frightened. They explain the **importance** of asking until I get the help needed.
Online Relationships	Children are able to give examples of when I should **ask permission** to do something online and explain why this is **important**. They use the internet with adult support to **communicate** with people Pupils (e.g. video call apps or services). Children are able to explain why it is important to be **considerate** and **kind** to people online and to **respect** their **choices**. They explain why things one person finds funny or sad online may not always be seen in the same way by others.	They give examples of how someone might use technology to **communicate**, and explain why this might be **risky**. They explain who I should ask before **sharing things** about myself or others online. They describe different ways to ask for, **give**, or **deny** my **permission** online and can identify who can help me if I am not sure. They identify who can help me if something happens online **without my consent**. Children are able to explain why I should always ask a trusted adult before clicking 'yes', '**agree'** or '**accept'** online.	Children are able to describe ways people who have similar likes and interests can get together online. Children are able to explain what it means to '**know someone' online** and why this might be different from **knowing someone offline**. They explain what is meant by '**trusting someone online'**. They explain why someone may **change their mind** about trusting anyone with something. Children are able to explain the importance of giving and **gaining permission** before sharing things online.	They describe strategies for safe and fun experiences in a range of **online social environments**. Children are able to give examples of how to be **respectful** to others online and describe how to recognise **healthy and unhealthy online behaviours**. They explain how content shared online may feel unimportant to one person but may be important to other people's thoughts **feelings and beliefs**.	Children are able to give examples of **technology-specific forms of communication**. They explain that there are some people I communicate with online who may want to do me or my friends **harm**. They describe some of the ways people may be involved in **online communities**. Children are able to explain how someone can get help if they are having problems and identify when to tell a **trusted adult**. They demonstrate how to **support others** (including those who are having difficulties) online.	Children are able to explain how sharing something online may have an impact either **positively** or **negatively**. They describe how to be kind and show respect for others online including the **importance of respecting boundaries**. They describe how things shared privately online can have **unintended consequences** for others. They explain that taking or sharing inappropriate images of someone (e.g., embarrassing images), even if they say it is okay, may have an impact for the **sharer** and others.

Online Reputation	Children are able to recognise that **information can stay online and could be copied.** They describe what information I **should not put online without asking a trusted adult first.**	They explain how information put online about someone **can last for a long time.** Children are able to describe how **anyone's online information could be seen** by others. Pupils know who to talk to if something has been put online **without consent or if it is incorrect.**	They explain how to **search for information** about others online. They give examples of what anyone may or may not be **willing to share about themselves online**. Children are able to explain the need to be **careful before sharing anything personal**. They **explain who someone** can **ask** if they are **unsure** about putting something online.	Children are able to describe how to **find out information about others by searching online.** They explain ways that some of the information about anyone **online could have been created, copied or shared by others**.	They search for information about an individual online and **summarise** the information found. Children are able to describe ways that information about anyone online can be used by others to make **judgments** about an individual and why these may be **incorrect**.	They explain the ways in which anyone can develop a **positive online reputation**. Children are able to explain strategies anyone can use to protect their '**digital personality'** and **online reputation**, **including degrees** of **anonymity**.
Online Bullying	They describe how to **behave online** in ways that do not upset others and can give examples.	They explain what bullying is, how people may bully others and how bullying can make someone feel. Children are able to explain why **anyone who experiences bullying is not to blame.** They talk about how **anyone experiencing bullying can get help**.	They describe appropriate ways to **behave towards other people online** and why this is important. They give examples of how bullying behaviour **could appear** online and how someone can get **support**.	Children are able to recognise when someone is **upset**, **hurt** or **angry** online. They describe ways people can be **bullied through a range of media.** Children are able to explain why people need to **think carefully** about how **content** they post might affect others.	They recognise online bullying can be different to bullying in the physical world and can **describe** some of those **differences**. Children are able to describe how what one person **perceives** as playful joking and teasing (including '**banter'**) might be experienced by others as bullying. They explain how anyone can get help if they are being **bullied online** and identify when to tell a **trusted adult**. Children are able to identify a range of ways to **report concerns** and **access support** both in school and at home about online bullying. They describe the **helpline services** which can help people experiencing bullying, and how to access them.	They describe how to **capture bullying content as evidence** (e.g screen-grab, URL, profile) to share with others who can help me. Children are able to explain how someone would **report online bullying in different contexts.** They explain how to **block abusive users.**

Managing Online Information	Children are able to give simple examples of how to **find information using digital technologies**, e.g. search engines, voice activated searching. Pupils / understand that we can encounter a range of things online including things we **like** and **don't like** as well as things which are **real** or **make believe** / a joke. Pupils how to get help from a trusted adult if we see content that makes us feel **sad**, **uncomfortable**, **worried** or **frightened**.	They use **simple keywords** in **search engines**. Children are able to demonstrate how to **navigate** a simple webpage to get to information I need. They explain why some information I find online may **not be real or true**.	They demonstrate how to use **key phrases** in search engines to **gather accurate information online**. Children are able to explain the difference between a '**belief**', an '**opinion**' and a '**fact**. and can give examples of how and where they might be shared online. They explain that **not all opinions shared may be accepted as true or fair** by others. They describe and demonstrate how we can get help from a trusted adult if we see content that makes us feel sad, uncomfortable, worried or frightened.	I understand why it is important to **make my own decisions** regarding content. Children are able to explain why lots of people **sharing the same opinions or beliefs online do not make those opinions or beliefs true**. They explain that technology can be designed to act like or **impersonate living things**. Children are able to explain what is meant by **fake news**.	They explain what is meant by '**being sceptical**'. Children are able to evaluate digital content and can explain how to make **choices** about what is **trustworthy**. They explain key concepts including: information, reviews, **fact**, **opinion**, **belief**, **validity**, **reliability** and **evidence**. Children are able to identify ways the internet can draw us to **information for different agendas.** They describe ways of identifying when online content has been **commercially sponsored** or **boosted**. Children are able to explain what is meant by a '**hoax**'.	Children are able to explain how to use **search technologies effectively**. They explain how and why some people may present '**opinions**' as '**facts**'; why the popularity of an opinion or the personalities of those promoting it does not necessarily make it **true**, **fair** or perhaps even **legal**. Children are able to define the terms '**influence**', '**manipulation**' and '**persuasion**' and explain how someone might encounter these online. They describe the difference between online **misinformation** and **dis-information**. Children are able to explain why information that is on a large number of sites may still be **inaccurate** or **untrue**. They **identify**, **flag** and **report inappropriate content**.
Health, Well-being and Lifestyle	They explain rules to keep myself **safe** when using **technology** both in and beyond the home.	Children are able to explain simple **guidance** for using technology in different environments and **settings**. They say how those **rules** / guides can help anyone accessing online technologies.	Children are able to explain why **spending too much time** using technology can sometimes have a **negative impact** on anyone. They give some examples of both **positive** and **negative activities** where it is easy to spend a lot of time engaged. Children are able to explain why some online activities have age **restrictions**.	They explain how using technology can be a **distraction** from other things, in both a **positive and negative way.** Children are able to identify times or situations when someone may **need to limit the amount of time they use technology**.	They describe ways technology can affect **health** and **well-being** both **positively** and **negatively.** Children are able to describe some strategies, tips or advice to **promote health and wellbeing with regards to technology.** I recognise the benefits and risks of accessing information about health and well-being online and how we should **balance** this with talking to trusted adults and professionals. They explain how and why some apps and games may request or **take payment for additional content**.	They describe common systems that regulate age-related content (e.g. **PEGI**, **BBFC**, parental warnings) and describe their purpose. I recognise and can discuss the **pressures** that technology can place on someone and how / when they could manage this. Children are able to recognise features of **persuasive design** and how they are used to keep users engaged. They assess and action different strategies to limit the impact of technology on **health**.

Privacy and Security	They explain how **passwords** are used to **protect information**, **accounts and devices.** They recognise more detailed examples of **information that is personal to someone**. Children are able to explain why it is important to always ask a trusted adult before sharing any personal information online, belonging to myself or others.	They explain how passwords can be used to protect information, accounts and devices. They explain and give examples of what is meant by '**private'** and '**keeping things private'**. They describe and explain some **rules for keeping personal information private**. Children are able to explain how some people may have devices in their homes connected to the internet and give examples	Children are able to describe simple **strategies for creating and keeping passwords private**. Pupils are able to give reasons why someone should only share information with people they choose to and can **trust**. Children are able to explain that if they are not sure or feel **pressured** then they should tell a trusted adult. Children describe how connected devices can **collect and share anyone's information** with others.	Children are able to describe strategies for **keeping personal information private**, depending on context. Children are able to explain that **internet use is never fully private and is monitored**. Children are able to describe how some online services may seek consent to store information about me. Pupils know what the digital **age of consent** is.	They explain what a **strong password** is and demonstrate how to create one. Children are able to explain how many free apps or services may **read and share private information**. They explain what app **permissions** are and can give some examples.	They describe effective ways people can **manage passwords**. They explain what to do if a password is **shared**, **lost or stolen**. They describe ways in which some online content targets people to **gain money or information illegally**. Pupils that online services have **terms and conditions** that govern their use.

Theme Overview: Programming

It's worth noting that computer science aims to cover two distinct, but related, aspects. There's a focus on computer science itself (the ideas and principles that underpin how digital technology works) but this sits alongside the practical experience of programming, almost certainly the best way for primary pupils to learn about computer science.

Computer Science is more than programming, but programming is an absolutely central process for Computer Science. In an educational context, programming encourages creativity, logical thought, precision and problem-solving, and helps foster the personal, learning and thinking skills required in the modern school curriculum. Programming gives concrete, tangible form to the idea of "abstraction", and repeatedly shows how useful it is.

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<tr><td>Curriculum National</td><td colspan="2">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</td><td colspan="4">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</td></tr>
<tr><td>Capability Statements</td><td>Pupils create, debug and implement instructions (simple algorithms) as programs on a range of digital devices.

Pupils understand that digital devices follow precise and unambiguous instructions. Pupils understand that digital devices can simulate real situations.</td><td>Pupils understand that algorithms are implemented as programs on digital devices.

Pupils create and debug programs to achieve specific goals and understand the importance of sequence.

Pupils use the principles of logical reasoning to plan and predict the behaviour of simple programs.

Pupils solve problems on and off screen.</td><td>Pupils create programs to accomplish specific goals using an increasing range of digital devices and applications.

They can decompose programs to test them and understand how making even small changes to an algorithm can have a significant impact on the outcome.

They begin using simple repetition (e.g. 'repeat x times' and 'repeat forever').</td><td>Pupils create, deconstruct and refine programs to accomplish specific goals.

Pupils understand and use simple selection (e.g. if/then and if/then/else) to create interactive programs based on conditions being met / not met.

They begin to use simple operators within their programs.

They begin using simple repetition (e.g. 'repeat x times' and 'repeat forever') and understand how this can be used to improve efficiency in their programs.</td><td>Pupils create and debug programs containing simple repetition (e.g. 'repeat x times' and 'repeat forever') as well as more complex repetition (e.g. 'nested loops').

They create programs with loops which terminate when conditions are met or continue whilst conditions are present (e.g. 'repeat until' and 'repeat whist').

Pupils increasingly use their programming capability to control or simulate a range of different outputs in physical systems.

Pupils begin to explore and notice the similarities and differences between programming languages and use this knowledge to help them create and debug programs efficiently.</td><td>Pupils create, deconstruct and refine an increasingly complex range of programs to accomplish specific goals.

Pupils create programs which store, change and report variables (e.g. scores in a game or time) and can include multiple variables in a single program.

Pupils can explain why they have structured algorithms as they have and describe the effect this has on a program.</td></tr>
</table>

	Early Capability		Middle Capability		Later Capability	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Creating Algorithms (Coding)	Children are able to understand what **instructions** are and **predict** what might happen when they are followed. They use **code** and are able to make a computer program. Pupils understand what **object** and **actions** are. They understand what an **event** is. Children are able to **use an event to control an object**. Children are able to begin to **understand how code executes** when a program is run. Pupils understand what **backgrounds** and **objects** are. Children are able **to plan and make a computer program**.	Children are able to understand what an **algorithm** is. They create a **computer program using an algorithm**. Children are able to create a program using a **given design**. They understand the **collision detection** event. Children are able to **understand that algorithms follow a sequence**. Pupils understand how to **design an algorithm** that follows a **timed sequence**. Pupils understand that different **objects** have different **properties**. Children are able to understand what different **events** do in code. They understand the function of buttons in a program. They understand and **debug simple programs**	Children are able to understand what a **flowchart** is and how flowcharts are used in **computer programming**. Children are able to understand that there are different types of **timers** and select the right type for purpose. Pupils understand how to use the **repeat command**. Children are able to understand the **importance** of **nesting**. They **design and create an interactive scene**.	Children are able to begin to understand **selection** in **computer programming**. Pupils understand how an **IF statement** works. Children are able to understand how to use co-**ordinates in computer programming**. They understand the **'repeat until'** command. Children are able to understand how an **IF/ELSE statement** works. Pupils understand what a **variable** is in programming. They use a **number variable**. Children are able to **create or code a playable game**.	Pupils understand how to begin to simplify **code, using a procedure**. They create a **playable game**. Pupils understand what a **simulation** is. Children are able to **program a simulation using simple code and algorithms**. Children are able to know what **decomposition** and **abstraction** are in computer science. Pupils understand how to a take a real-life situation, decompose it and think about the level of abstraction. Children are able to understand how to use friction in code. They begin to understand what a **function** is and how functions work in code. Pupils understand what the **different variables** types are and how they are used differently. Children are able to understand how to create a **string**. Pupils understand what **concatenation** is and how it works.	Children are able to design a playable game with a **timer** and a **score**. They plan and **use selection and variables**. Children are able to understand how the **launch command** works. Children are able to **use functions** and understand why they are useful. Children are able to understand how functions are created and called. Pupils understand how to **use flowcharts to create and debug code**. Pupils understand how to create a **simulation** of a room in which devices can be **controlled**. Pupils **understand how user input can be used** in a program. Pupils understand how code can be used to **make a text-adventure game.**

Theme Overview: Understanding Technology

Children's natural curiosity has always driven them to develop an understanding of the world around them and this is no different when it comes to understanding technology; both how it works and what it can do for us. From their first, early experiences with technology, pupils begin to make sense of how it works and the opportunities it can provide. Throughout their time in primary education, pupils now need to extend that understanding to include computer networks such as the Internet, and the services they can provide such as the World Wide Web. Teachers need to provide practical, fun experiences that allow pupils to make links with their existing understanding of the world around them. In doing so, pupils will ultimately become much more effective creators and users of digital content.

<table>
<tr><th></th><th colspan="2">Early Capability</th><th colspan="2">Middle Capability</th><th colspan="2">Later Capability</th></tr>
<tr><th></th><th>Year 1</th><th>Year 2</th><th>Year 3</th><th>Year 4</th><th>Year 5</th><th>Year 6</th></tr>
<tr><td>National Curriculum</td><td colspan="2">• Recognise common uses of information technology beyond school</td><td colspan="4">• 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</td></tr>
<tr><td>Capability Statements</td><td>Pupils recognise and can give examples of common uses of information technology they encounter in their daily routine.</td><td>Pupils recognise common uses of information technology beyond school, including those which they don't frequently encounter in their daily routine.

Pupils understand that computers are not intelligent but can appear to be when following algorithms. They can share examples of this.</td><td>Pupils understand that computers (in various forms) generally accept inputs and produce outputs and can give examples of this.

Pupils recognise - and can describe - some of the services offered by the Internet, especially those used for communication and collaboration.</td><td>Pupils develop a basic understanding of how computers can be linked to form a local network such as those found in schools.

Pupils recognise that there is a difference between the Internet and the World Wide Web.

They can recognise and describe some of the services offered by the Internet, especially those used for communication and collaboration.</td><td>Pupils know that there is a difference between the Internet and the World Wide Web and understand that the web is just one of the services offered by the Internet (as well as, e.g. email and VoIP services such as Skype).

They appreciate how search results are ranked, including an understanding of the use of different algorithms to prioritise results. Pupils understand that the highest-ranking search results may not always be the most relevant. They appraise search results based on their relevance and trustworthiness, and can explain what is meant by 'fake news'</td><td>Pupils understand and can explain how computer networks work, including the Internet. They begin to understand how data travels across networks in packets and how these can be broken up and reconstructed.

When accessing information online, pupils recognise that opinions may be presented as facts. They can describe why an opinion may easily become popular online but they understand that this doesn't necessarily make it true.

They understand that some online content may be commercially sponsored such as adverts in search results or content presented by social media influencers.</td></tr>
<tr><td colspan="7">More specific guidance for individual year group teachers can be found in the phase overviews at www.theictservice.org.uk/primary-computing</td></tr>
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