

## Castlefields Subject Overview for whole school – Computing

Progression across year groups, following the four strands of computing:

### Understanding Technology, Programming, Digital Literacy and E-Safety.

	Understanding Technology	Programming	Digital Literacy	E-Safety
EYFS	<p>Play with equipment that simulates control devices (push button toys). Play with a simple adventure programme or simulation. Use simulation/role play software as an impetus for investigations Explore outcomes when individual buttons are pressed on a robot.</p>	<p>Begin to understand that ICT can be used to communicate ideas in different ways. Begin to use a keyboard (with support) and notice the effect on screen. Understand there are a variety of tools in a graphics (art) package. Understand that cameras can take still and moving images (video). Understand that technological devices can be used to record and play back sounds.</p>	<p>With help search for and choose images from the internet. With support, use appropriate websites to locate small amounts of information. With support enter text into a search engine to find specific given web sites (e.g. CBeebies). With support use a digital microscope to look more closely at objects. Begin to develop simple classification skills by carrying out simple sorting activities (probably away from the computer). Start to recognise simple technologies in the world around us (phones, computers, printers etc.).</p>	<p>With help save their own content in their own electronic folder. Understand their logon to the network or Learning Platform is personal to them. Start to learn to respect the work of others. Know to tell someone if they view content that they think is inappropriate or upsetting.</p>
Year One	<p>Pupils recognise and can give examples of common uses of information technology they encounter in their daily routine.</p>	<p>Pupils create, debug and implement instruction (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 simulate real situations.</p>	<p>Pupils increasingly use a range of technology to enquire with purpose, accessing and creating digital content such as still and moving images, video, audio and text. With appropriate levels of support, pupils collect data (e.g. numerical, research facts etc.) which they can retrieve, store and manipulate.</p>	<p>Pupils understand that information about themselves may be personal and they can choose who to share it with. With support, pupils can manage can their online activity safely, recognising which information should be kept private. They can explain what it means to stay safe online and older pupils identify some of the potential risks associated with the online world.</p>
Year Two	<p>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.</p>	<p>Pupils understand that algorithms are implemented as programs on digital devices. Pupils create and debug programs to achieve specific goals. Pupils use the principles of logical reasoning to plan and predict the behaviour of simple programs. Pupils solve real and imaginary problems on and off screen.</p>	<p>They can present and communicate their learning to others in a variety of ways. With support, pupils are beginning to access and retrieve online content, making appropriate choices to achieve specific goals.</p>	<p>They communicate safely and respectfully using a range of digital devices, making links to their behaviour in the physical world. Pupils start to develop strategies for managing concerns about online content or contact; seeking help and support when needed.</p>

Year Three	<p>Pupils understand that computers (in various forms) generally accept inputs and produce outputs and can give examples of this.</p> <p>Pupils develop a basic understanding of how computers can be linked to form a local network such as those found in schools. Pupils are aware of some of the services offered by the Internet and can describe when they are, and are not, using online technologies.</p>	<p>Pupils create programs to accomplish specific goals: - using an increasing range of digital devices and applications. - exploring and understanding the impact of changing instructions. - using sequence and repetition - decomposing problems both on and off screen - using the principles of logical reasoning in order to resolve problems.</p>	<p>Pupils are confident and creative users of technology. They are beginning to make informed choices about the appropriateness of digital content they access and create, using an increasing range of digital resources and devices Pupils identify, collect and manipulate different types of data (e.g. numerical data from science experiments, words, still and moving images etc.) which they present as information, showing a greater awareness of purpose and audience.</p>	<p>Pupils, review their online activity, including maintaining amending online profiles, communication channels and publishing spaces to ensure they do not inadvertently reveal personal details. Pupils show respect for content created by others by acknowledging sources, commenting respectfully and responsibly on other people's work and respecting privacy. They are discriminating about what they share and whether any permission is needed to do so.</p>
Year Four	<p>Pupils understand the role of web browsers when viewing web pages and can explain how individual web pages can be found (e.g. by clicking on a favourite link, search result or by typing in a URL). They recognise that there is a difference between the Internet and the World Wide Web. Pupils recognise and describe some of the services offered by the Internet, especially those used for communication and collaboration.</p>	<p>Pupils create and debug programs. They can: - use sequence and repetition. - refine algorithms to improve efficiency - control or simulate 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.</p>	<p>Pupils become more discerning in their choice of search technology to accomplish specific goals. They understand the need for efficiency when conducting searches, choosing keywords carefully.</p>	<p>Pupils can identify a range of potential online risks including inappropriate contact or content and can identify ways of seeking support and reporting concerns. They exercise caution when receiving attachments and following web links contained in messages.</p>
Year Five	<p>Pupils understand and can explain how computer networks work and know that the Internet is a collection of computers connected together. 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)</p>	<p>Pupils create, deconstruct and refine programs to accomplish specific goals. They can: - improve efficiency - use selection within programs - use a range of simple inputs and outputs to control or simulate physical systems. Pupils use logical reasoning to explain how some algorithms work and to detect and correct errors in programs. They independently employ strategies to solve problems.</p>	<p>Pupils are confident, capable and creative users of technology, selecting and making effective use of digital resources and devices for purpose and effect. They create programs, systems and digital content, thinking carefully about aesthetics, functionality and impact on the user. They 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.</p>	<p>Pupils continue to maintain, review and amend online identities, considering the potential impact of these on their digital footprint. They communicate in a wide variety of ways and pay careful attention to what details might be inadvertently revealed. They engage in an increasing range of online communities safely, respectfully and responsibly both with friends and the wider online community. With adult support, they actively consider and use safety and security settings on a range of digital devices.</p>

<b>Year Six</b>	Pupils begin to understand how data travels across networks in packets and how these can be broken up and reconstructed. They appreciate how search results are ranked, including an understanding of the role of 'relevance' and 'importance' in finding and presenting results.	Pupils deconstruct, improve and create programs including: - using selection and working with variables. - using the principles of logical reasoning - challenging themselves by making simple programs increasingly complex and employ a variety of strategies to solve problems. Pupils can explain why they have structured algorithms as they have and describe the effect this has on a program.	Pupils are discerning in evaluating digital content. They use search technologies effectively to respond to enquiries and support their learning.	When using online resources and search technologies, pupils are increasingly discerning about what information they gather, checking the validity of data and showing due respect to privacy and copyright. Pupils can recognise a range of potential online risks, including inappropriate contact or content and can identify ways of seeking support and reporting concerns.
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### **Digital Skills**

Content develops skills for effective, efficient communication; creation of digital content (text, audio, visual media, programs); collecting, analysing and evaluating data.

### **Digital Literacy**

Content develops digital literacy, including critical evaluation of digital artefacts; research skills including validating information found; using ICT to develop learning, communication and collaboration; awareness of their own (and others) online identities.

### **Technology in the World**

Content develops an understanding of the range of devices used in the world; an awareness of how technology is used in the workplace; an awareness of the range of jobs that might use ICT and how a range of different roles might contribute to a creative project; an awareness of effective web design to support their own use of the internet; considerations of e-commerce, including security and advertising impact on web use; web design skills; where appropriate, development of specific work place skills.

Learning provides historical context and opportunity to "future-gaze" - generating a sense of awe and wonder for the range and rate of developments; respect for and awareness of key people in the history of computing and ICT; awareness of the impact on society as a whole and on individuals; encourages learners to creatively and imaginatively consider possible future developments

### **Technical Understanding**

Content develops technical understanding of hardware, software, networks, approaches to design in computing and ICT; computer science content is covered creatively in a way that links it with digital literacy and information technology.

### **Safe and Responsible Use**

E-safety learning and safe, responsible use is embedded throughout the curriculum; safe and responsible use goes beyond e-safety and includes opportunities to develop awareness of and apply knowledge and understanding of current legislation including copyright; ethics; environmental impact; protection from cyber-attacks including hacking.