



Computing

Progression of Skills and Knowledge

Intent:

Our curriculum is built around the key skills of Computer Science, Digital Literacy and ICT. We ensure there is a progression of skills to enable our pupils to become confident and discerning users of technology. Our pupils will go on to jobs that do not yet exist and it is clear that computing and information technology will be an integral part of the 21st Century workforce. We want to ensure that children have the necessary skills to use technology purposefully, as well as being selective about what resources will best aid them in their learning. In addition, we ensure that children are safe users of technology with the intention that these behaviours are carried on to their use of technology beyond the school day.

Implementation

The curriculum for computing ensures coverage of the National Curriculum objectives. Alongside our Power of Reading texts and wider curriculum topics, teachers look for opportunities to embed computing learning so that it is purposeful and relevant. Coding enables children to develop their problem-solving skills and to ask 'What if...' questions to develop their learning further. In developing their Digital Literacy, children learn ways to use technology as a collaborative tool as well as learning safeguards that can help them use it safely and securely. Throughout all subjects, information technology is used as a tool to support learning through research, recording and presenting work.

Impact

The impact of computing is evident as you walk around the school. Teachers and pupils use technology to support learning in class in all subject areas. Every teacher monitors the development of the computing skills of the pupils in their class and looks for ways to link to further areas of learning. Pupils are able to talk confidently about their use of technology and its safe and responsible use.

3 – 4 years		Reception		ELG		
Communication and Language	Enjoy toys that make sounds. Listen to and respond to a simple instruction.	Personal, Social	Show resilience and perseverance in the face of challenge.	Understanding the World	People, Culture and Communities	
					The Natural World	
		Maths	Understand position through words alone – for example ‘The bag is under the table’. Describe a familiar route. Discuss routes and locations using words like ‘in front of’ and ‘behind’. Notice and correct errors in a repeating pattern. Continue, copy and create repeating patterns.			

Online Safety and Digital Literacy

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Pupils should be taught to 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 their online technologies.		Pupils should be taught to use technology safely, respectfully and responsibly, recognise acceptable/unacceptable behaviour, identify a range of ways to report concerns about content and contact. Be discerning in evaluating digital content.			
How do I log in safely on the computer or device? Why is it important to log out?	Who can see things on the Internet? How should I talk to others online? What is a digital footprint?	Why is a good password so important? Is everything online real and true? What is inappropriate content?	What is identity theft? Is all software and apps safe to install? What is plagiarism and is it OK?	How I make online life good for everyone? Is this a reliable website for my learning? What happens to my image after I post?	Does my device give away personal information? Does my digital footprint matter? Does screen time affect my health and wellbeing?
* I can keep my password private. * I can tell you what personal information is. * I can tell an adult when I see something worrying or unexpected online. * I can talk about why it is important to be kind and polite. * I can recognise a suitable website (age appropriate) * I can agree and follow sensible e-Safety rules.	* I can explain why I need to keep my password and personal information private. * I can describe things that happen online that I must tell an adult about. * I can talk about why I should only go online for short amounts of time. * I can talk about why it is important to be kind and polite online (just like real life) * I know that not everyone is who they say they are online.	* I can talk about what makes a secure password and why they are important. * I can protect my personal information when I am online. * I can use the safety features of a website as well as reporting concerns to adults. * I can recognise websites and games that are appropriate to my age. * I can make good choices about how long I spend online. * I understand the importance of safe downloading. * I can post positive comments online. * I understand that not everything online is real.	* I can choose a secure password when I am using a website. * I understand the importance of protecting personal information online. * I can talk about ways I can protect myself from harm online. * I can use the safety features of websites as well as reporting concerns to an adult. * I understand that anything I post online could be seen by others. * I can talk about why I need to talk to a trusted adult before downloading from the Internet. * I understand the term plagiarism and its implications.	* I protect my password and other personal information. * I can explain why I need to protect myself, and others, including reporting concerns to an adult. * I know that anything I post online can be seen and manipulated. * I can talk about the dangers of spending too long on one game or site. * I can discuss the importance of choosing an age-appropriate website. * I know which resources on the Internet I can download and use. * I can decide which websites are appropriate for my age (and their content).	* I protect my password and other personal information. * I can explain the consequences of over-sharing information about myself online. * I support my friends to make good choices online, including reporting concerns to an adult. * I can explain the consequences of spending too long on one game or website. * I can protect my device from harm (and from sharing my personal data) * I understand the possible consequences of my digital footprint.

Key vocabulary Device, log in, log out, private, password, help, adult, tell, website, online, safety	Key Vocabulary Information, personal, public, private, protect, online, website, reporting, concerns, adult, tell, behaviour, polite, digital footprint	Key Vocabulary Information, personal, private, public, password, secure, security, safety, reporting, appropriate, content, download, positive, negative, online, reliable,	Key Vocabulary Secure, security, protection, data, private, password, harm, reporting, visibility, downloading, plagiarism, implication	Key Vocabulary Personal information, protect, secure, safe, adult, concern, reporting, manipulate, screen-time, digital footprint, age-appropriate, content, worrying, inappropriate,	Key Vocabulary Password, protection, secure, over-sharing, public, private, security, screen-time, device, protection, digital footprint, consequences
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Programming (Computer Science)

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Pupils should be taught 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.		Pupils should be taught to 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 or output. Use logical reasoning to explain how some algorithms work and to detect and correct errors in algorithms and programs. 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 and content that accomplish specific goals.			
* I can give instructions to my friend and follow their instructions to move around. * I can describe what happens when I press buttons on a robot. * I can press buttons to make my robot do what I want. * I can describe the needed instructions and begin to use the word algorithm. * I can predict what will happen for a short set of instructions. * I can use the word 'debug' when I correct mistakes in my program. Note: Use of bee bots for practical programming, introduction to on-screen coding with Purple Mash Y1 coding unit.	* I can give instructions to my friend (using directional language) and physically follow their instructions. * I can tell you the order I need to do things to make something happen and talk about this as an algorithm. * I can program a robot or software to complete a particular task. * I can look at someone else's program and tell you what will happen. Purple Mash Y2 Coding unit * I can use programming software to make objects move. * I can watch a program execute and spot where it goes wrong to help me debug it.	* I can break an open-ended problem into smaller parts. * I can put programming commands into a sequence to achieve a specific outcome. * I keep testing my program and recognise when it needs to be debugged. * I can use repeat or 'loop' commands. * I can describe the algorithm I will need to complete a task. * Completion of Code.org Course B * MICRO BIT: simple programs to make LEDs switch on and off e.g. spell a word. * MICRO BIT – Saving Sea Creatures Unit.	* I can use logical thinking to solve an open-ended problem into smaller parts. * I can use an efficient procedure to simplify a program. * I can use a sensor to detect a change which can affect my program (MICRO BIT: movement sensor to make an alarm) * I know that I need to keep testing my program when compiling it. * I can use a variety of tools to create a program. * I can recognise errors in my program and debug them. * My programs include loops and simple events. * Completion of Code.org Course C * MICRO BIT: Protecting animals on land unit. * MICRO BIT – Electrical conductor tester.	* I can decompose a problem into smaller parts to design an algorithm for a specific outcome. * I can refine a procedure by simplifying with loop (repeat) commands. * I can use a variable to increase programming possibilities. * I can select an action with the If... Then... command. * I can change an input to a program to achieve a different output. * I can use logical thinking, imagination and creativity to extend a program. * I can use pseudocode as a starting point for coding. * Completion of Code.org Course D * MICRO:BIT – Handling data unit.	* I can deconstruct a problem into smaller steps, recognising similarities to previously used solutions. * I can explain and program each of the steps in my algorithm. * I can test the effectiveness and efficiency of my program. * I can use different inputs (including sensors) to control a device or onscreen action. * I can use logical reasoning to detect and correct errors in my programs. * My programs include loops, variables, events and data changes (e.g. modify score) * Completion of Code.org Course E * MICRO:BIT – Getting active unit.

Key Vocabulary Instructions, robot, follow, problem, algorithm, predict, fix, debug	Key Vocabulary Forwards, backwards, left, right, stop, instructions, algorithm, program, code, order, predict, bug, debug	Key Vocabulary Algorithm, code, instructions, sequence, outcome, bug, debug, loop, repeat, block,	Key Vocabulary Algorithm, code, instructions, sequence, procedure, loops, repeat, sensor, input, output, event,	Key Vocabulary Algorithm, code, sequence, instructions, loops, repeat, input, output, sensor, logical, pseudocode, logic, if, then,	Key Vocabulary Problem, deconstruct, steps, algorithm, code, procedure, bug, debug, event, loop, variable, sensors, input, output, logical reasoning
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ICT

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
HANDLING DATA					
Pupils should be taught to use technology purposefully to organise and manipulate digital content.		Pupils should be taught to select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of content that can achieve specific goals, including collecting, analysing, evaluating and presenting data and information.			
* I can talk about different ways that information can be shown. * I can sort information and present it to others. * I can add information to a pictogram and explain my findings.	* I can make and save a chart or graph using data I have collected. * I am starting to understand a branching database.	* I can talk about different ways that data can be organised. * I can collect and add data to a spreadsheet * I can describe cells using their addresses. * I can manipulate data in a spreadsheet in simple ways e.g. adding cells	* I can organise data in different ways. * I can collect data and identify where it may be inaccurate. * I can plan and create a spreadsheet to answer a question. * I can choose the best way to present my data. * I can interpret a line graph and begin to predict values from it.	* I can use a spreadsheet to collect and record data. * I can use a spreadsheet to model a real-life problem. * I can present data e.g. chart or a graph * I can talk about possible mistakes in data and how it could be checked.	* I can select the most effective tool or layout to collect data for my investigation. * I can create a spreadsheet to answer a mathematical problem. * I can check data for accuracy. * I can present data collected in a spreadsheet
MULTIMEDIA					
Pupils should be taught to use technology purposefully to create digital content.		Pupils should be taught to select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of content that accomplish specific goals.			
* I can use technology to collect information, including photos * I can be creative with different digital tools. * I can save information in a special place and retrieve it again. * I can use basic word processing to create and illustrate a short story. * I can make simple digital paintings. * I can use digital cameras and microphones.	* I can use technology to organise and present my ideas in different ways. * I can save and open files on the device I use. * I can take, store and make simple edits to photos. * I can add photos into other projects to make more complex products.	* I can take, adapt and make more complex edits to photos and videos. * I can develop a simple storyboard and then create an animation. * I can record and edit media to make a short video sequence.	* I can plan, shoot and edit a simple video about an aspect of my learning * I can create a stop-motion animation * I can create documents and posters that combine text and graphics, thinking about an effective layout.	* I can use more complex video effects such as 'green screen' * I can create products that contain a range of media (sound, graphics, animation etc). * I can create original music compositions using digital tools.	* I can create products that contain a wide range of media and justify my choices. * I can create a content-rich online book linked to an area of my learning (Keynote combined with other content e.g. Clips app video, photos taken and edited, sound inserted etc). * I can plan, create and deliver a presentation.

Key Vocabulary Information, choices, pictogram, photo, camera, text, image, paint, brush, size, save, open,	Key Vocabulary Save, open, retrieve, device, photo, digital, edit, size, crop, insert, add, manipulate	Key Vocabulary Digital, crop, resize, filter, storyboard, plan, spreadsheet, cell, address, formula, tool, manipulate, animate, images, sequence.	Key Vocabulary Shoot, film, edit, sequence, timeline, effect, animation, frame, text, graphics, layout, white space, spreadsheet, formula, cell, address, data, information, present,	Key Vocabulary Video, sequence, storyboard, timeline, effect, media, sound, graphics, animation, music, clips, repeat, spreadsheet, errors, chart, graph, analyse	Key Vocabulary Data, cell, formula, accuracy, media, graphics, texts, effects, sound, animation, presentation, slide, transition, layout
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Technology in our lives

This runs as a thread throughout all learning in computing. Teachers make links and references throughout the different areas (Digital literacy, Programming, ICT) as appropriate. This will form the basis for discussion but are not explicitly assessed.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Pupils should be taught to use technology purposefully to recognise common uses of technology beyond the school.		Pupils should be taught to understand computer networks, including the Internet, how they can provide services, such as the World Wide Web; the opportunities they offer for communication and collaboration. Use search technologies effectively, appreciating how results are selected and ranked, and be discerning in evaluating digital content.			
* How is technology used in our classroom? * Why do we use technology in the class and at home? * Who created the information I am using? * What are the good things about using technology? Are there bad things? * What is different between the Internet and the real-world?		* What are the different parts of a computer/device? * Is the content I am using on my device, the school network or the Internet? Who else can access it? * How reliable is information found online? * How can I find out who created the content I am using?		* How is information transported on the Internet? * How are the search results in a search engine ranked (understanding promoted content and paid adverts)? * What is copyright and should I be thinking about it? * What are the different ways I can communicate using technology? What benefits and challenges do they offer? * Do I use technology as safely outside of school as I do in-school?	

The Key Three!					
How do I log in safely on the computer?	How should I talk to others online?	Why is a good password so important?	What is plagiarism and is it OK?	Is everything online real and true?	Does my digital footprint matter?
Why are clear instructions so important?	What is an algorithm?	How can a loop improve your code?	Explain the meaning of an 'event' when coding.	What is a 'variable' when coding and how can they be used?	How do inputs affect outputs? What examples can you give?
Why is it important to save work in an organised way?	What changes can I make to digital photos after they have been taken?	Explain how a cell address works in a spreadsheet.	What should I consider to make an effective layout for my page?	What are the benefits of using a spreadsheet to investigate a problem?	What makes an effective presentation?