



Wallsend Jubilee Primary School

Skills Progression: Computing & ICT

Strands	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
COMPUTER SCIENCE	Enjoys listening to longer stories and can remember much of what happens.	Understand how to listen carefully and why listening is important. Learn new vocabulary	Understands what an algorithm is and is able to express simple linear (non-branching) Algorithms symbolically. Understands that computers need precise instructions. Demonstrates care and precision to avoid errors. (Action algorithms) (Programming Direction)	Understands what an algorithm is and is able to express simple linear (non-branching) Algorithms symbolically. Understands that computers need precise instructions. Demonstrates care and precision to avoid errors. (Programming with ScratchJnr) (Programming with Logo)	Understands that algorithms are implemented on digital devices as programs. Designs simple algorithms using loops, and selection. i.e if statements. Uses logical reasoning to predict outcomes. Detects and corrects errors. I.e. debugging in algorithms. (Programming Scratch Maze Games) (Getting started with Kodu) (Lego WeDo)	Designs solutions (algorithms) that use repetition and two-way selection i.e. if, then, and else. (Scratch – programming animation) Uses logical reasoning to predict outputs, showing an awareness of inputs. (Scratch – programming animation) (Lego WeDo – Give it a scratch) (Kodu Sport)	Designs solutions (algorithms) that use repetition and two-way selection i.e. if, then, and else. (Programming Robots) (Raspberry Pi) Uses diagrams to express solutions. (Raspberry Pi) Designs solutions by decomposing a problem and creates a sub-solution for each of these parts (decomposition). (Raspberry Pi) Recognises that different solutions exist for the same problem. (Kodu – 3D Pac Man) (Programming Robots) (Raspberry Pi)	Designs solutions (algorithms) that use repetition and two-way selection i.e. if, then and else. (Raspberry Pi) (Sonic Pi) Uses diagrams to express solutions. (Raspberry Pi) Uses logical reasoning to predict outputs, showing an awareness of inputs. (Raspberry Pi) (Sonic Pi) Creates programs that implement algorithms to achieve given goals. (Sonic Pi)
	Understand a question or instruction that has two parts, such as “Get your coat and wait at the door”.	Ask questions to find out more and to check they understand what has been said to them. Connect one idea or action to another using a range of connectives.	Knows that users can develop their own programmes, and can demonstrate this by creating a simple programme in an environment that does not rely on text e.g. Programmable robots etc. Executes, checks and changes programmes. Understands that programmes execute by following precise instructions. (Exploring Machines we Control.) (Action algorithms) (Programming Direction) (Exploring Digital Sound)	Understands that algorithms are implemented on digital devices as programs. Designs simple algorithms using loops, and selection. i.e if statements. Uses logical reasoning to predict outcomes. Detects and corrects errors. I.e. debugging in algorithms. (Programming with Logo) Knows that users can develop their own programmes, and can demonstrate this by creating a simple programme in an environment that does not rely on text e.g. Programmable robots etc. Executes, checks and changes programmes. Understands that programmes execute	Designs solutions (algorithms) that use repetition and two-way selection i.e. if, then, and else. (Real life Algorithms) Uses arithmetic operators, if statements, and loops, within programmes. Uses logical reasoning to predict the behaviour of programmes. Detects and corrects simple semantic errors. I.e. debugging in programs. (Lego WeDo) (Programming Scratch Maze Games) (Getting started with Kodu)	Creates programs that implement algorithms to achieve given goals. (Lego WeDo – Give it a scratch) (Kodu Sport) Declares and assigns variables. (Lego WeDo – Give it a scratch) (Kodu Sport) Uses post-tested loop e.g. ‘until’ and a sequence of selection statements in programs, including an if, then and else statement. (Kodu Sport)	Uses logical reasoning to predict outputs, showing an awareness of inputs (Kodu – 3D Pac Man) (Programming Robots) (Raspberry Pi) Creates programs that implement algorithms to achieve given goals. (Kodu – 3D Pac Man) (Programming Robots) (Raspberry Pi) Declares and assigns variables (Kodu – 3D Pac Man)	Creates programs that implement algorithms to achieve given goals. (Sonic Pi) Declares and assigns variables (Raspberry Pi) (Sonic Pi)
	Be able to express a point of view and to debate when they disagree with an adult or a friend, using words as well as actions.	Use talk to help work out problems and organise thinking and activities explain how things work and why they might happen	Understands that computers have no intelligence and that computers can do nothing unless a programme is executed.		Uses logical reasoning to predict outputs, showing an awareness of inputs.	Knows that computers collect data from various input devices, including sensors and application software.		Designs solutions by decomposing a problem and creates a sub-solution for each
	Are increasingly able to use and remember sequences and patterns of movements which are related to music and rhythm.	Select, rotate and manipulate shapes in order to develop spatial reasoning skills. Continue, copy and create repeating patterns.						
	Use large-muscle movements to wave flags and streamers, paint and make marks	Draw information from a simple map. Offer explanations for why things might happen, making use of recently introduced						

	<p>Understand the five key concepts about print: - print has meaning - print can have different purposes - page sequencing - we read English text from left to right and from top to bottom</p> <p>Develop their phonological awareness, so that they can: - spot and suggest rhymes - count or clap syllables in a word - recognise words with the same initial sound, such as money and mother</p> <p>Understand position through words alone – for example, “The bag is under the table,” – with no pointing.</p> <p>Describe a familiar route.</p> <p>Discuss routes and locations, using words like ‘in front of’ and ‘behind’.</p> <p>Talk about and identifies the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper.</p>	<p>vocabulary from stories, non-fiction, rhymes and poems when appropriate.</p>	<p>(Exploring Machines we Control) (Action algorithms) (Programming Direction) (Exploring Digital Sound)</p> <p>Recognises that all software executed on digital devices is programmed. (Exploring Machines we Control.) (Action algorithms) (Programming Direction) (Exploring Digital Sound)</p>	<p>by following precise instructions. (Programming with ScratchJnr)</p> <p>Understands that computers have no intelligence and that computers can do nothing unless a programme is executed (Programming with ScratchJnr) (Programming with Logo)</p> <p>Recognises that all software executed on digital devices is programmed. (Programming with ScratchJnr) (Programming with Logo)</p>	<p>(Lego WeDo)</p> <p>Recognises that a range of digital devices can be considered a computer. (Lego WeDo)</p> <p>Recognises and can use a range of input and output devices. Understands how programs specify the function of a general purpose computer. (Lego WeDo) (Programming Scratch Maze Games) (Getting started with Kodu)</p> <p>Creates programs that implement algorithms to achieve given goals. (Lego WeDo)</p> <p>Uses diagrams to express solutions. (real life algorithms)</p> <p>Declares and assigns variables. (Lego WeDo)</p> <p>Knows that computers collect data from various input devices, including sensors and application software. (Lego WeDo)</p>	<p>(Lego WeDo – Give it a scratch)</p> <p>Shows an awareness of tasks best completed by humans or computers. Knows that computers collect data from various input devices, including sensors and application software. (Lego WeDo - Give it a scratch) (Kodu Sports)</p> <p>Recognises that different solutions exist for the same problem. (Lego WeDo - Give it a scratch) (Kodu Sports)</p> <p>Understands the difference between, and appropriately uses if and if, then and else statements. (Kodu Sports)</p> <p>Uses a variable and relational operators within a loop to govern termination. (Lego WeDo - Give it a scratch) (Kodu Sports)</p>	<p>(Programming Robots) (Raspberry Pi)</p> <p>Uses post-tested loop e.g. ‘until’ and a sequence of selection statements in programs, including an if, then and else statement. (Kodu – 3D Pac Man)</p> <p>Understands the difference between, and appropriately uses if and if, then and else statements. (Kodu – 3D Pac Man)</p> <p>Uses a variable and relational operators within a loop to govern termination (Kodu – 3D Pac Man) (Programming Robots)</p> <p>Knows that computers collect data from various input devices, including sensors and application software. (What is a computer?)</p> <p>Understands the difference between hardware and application software, and their roles within a computer system (What is a computer?)</p> <p>Understands the difference between hardware and application software, and their roles within a computer system (Raspberry Pi) (Kodu – 3D Pacman)</p>	<p>of these parts (decomposition). (Raspberry Pi)</p> <p>Understands the difference between, and appropriately uses if and if, then and else statements. (Sonic Pi)</p> <p>Uses a variable and relational operators within a loop to govern termination (Sonic Pi)</p> <p>Designs, writes and debugs modular programs using procedures. (Sonic Pi)</p> <p>Understands why and when computers are used. (Inside the Internet)</p> <p>Understands that iteration is the repetition of a process such as a loop (Raspberry Pi) (Sonic Pi)</p> <p>Represents solutions using a structured notation (Sonic Pi)</p> <p>Has practical experience of a high-level textual language, including using standard libraries when programming. (Sonic Pi)</p> <p>Uses a range of operators and expressions e.g. Boolean, and applies them in the context of program control. (Raspberry Pi)</p>
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	<p>Use informal language like 'pointy', 'spotty', 'blobs' etc</p> <p>Extend and create ABAB patterns – stick, leaf, stick, leaf.</p> <p>Notice and correct an error in a repeating pattern.</p> <p>Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'</p>						<p>Understands why and when computers are used. (What is a computer?)</p> <p>Understands the main functions of the operating system (What is a computer?)</p>	<p>Defines data types: real numbers and Boolean. (Raspberry Pi)</p> <p>Knows that digital computers use binary to represent all data. (Raspberry Pi)</p> <p>Understands how bit patterns represent numbers and images (Raspberry Pi)</p> <p>Knows that computers transfer data in binary. (Raspberry Pi)</p> <p>Understands the relationship between binary and file size (uncompressed) (Raspberry Pi)</p> <p>Recognises and understands the function of the main internal parts of basic computer architecture. (Raspberry Pi)</p> <p>Understands how to construct static web pages using HTML and CSS. (Inside the Internet)</p> <p>Understands data transmission between digital computers over networks, including the internet i.e. IP addresses and packet switching. (Inside the Internet)</p>
IT	Explore collections of materials with similar and/or	Develop their small motor skills so that they can use a range of tools	Recognises that digital content can be represented in many forms.	Recognises that digital content can be represented in many forms.	Recognises different types of data: text, number. (Databases)	Shows an awareness of, and can use a range of internet services, e.g. VOIP.	Understands the difference between data and information. (What is a computer?)	Uses a variety of software to manipulate and present digital

	different properties.	competently, safely and confidently. Suggested tools: pencils for drawing and writing, paintbrushes, scissors, knives, forks and spoons	(An intro to digital art) (Making multimedia stories) (Exploring Digital Sound)	(Intro to Animation) (Finding & Presenting Information) (Writing in Different Styles) (Beginning to Present)	Understands the difference between data and information. (Databases)	Collects, organises and presents data and information in digital content. (Searching the Web) (Collaborative Websites)	Knows why sorting data in a flat file can improve searching for information. (Collecting, testing and presenting data)	content: data and information. (Manipulating Images) (Video Editing)
	Explore how things work.				Appreciates that programmes can work with different types of data. (Databases)	Creates digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience. E.g. Blogging. (Searching the Web) (Collaborative Websites) (3D Design – Sketch Up)	Uses filters or can perform single criteria searches for information. (Collecting, testing and presenting data)	Shares their experiences of technology in school and beyond the classroom. (Manipulating Images)
	Make imaginative and complex ‘small worlds’ with blocks and construction kits, such as a city with different buildings and a park.	Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor.	Distinguishes between some of these forms and can explain the different ways that they communicate information. (An intro to digital art) (Making multimedia stories)	Recognises different types of data: text, number. (Finding & Presenting Information)	Recognises that data can be structured in tables to make it useful. (Databases)		Shows an awareness of, and can use a range of internet services e.g. VOIP. Collects, organises and presents data and information in digital content. (Collecting, testing and presenting data)	Talks about their work and makes improvements to solutions based on feedback received. (Manipulating Images) (Video Editing)
	Explore different materials freely, in order to develop their ideas about how to use them and what to make	Explore, use and refine a variety of artistic effects to express their ideas and feelings Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively sharing ideas, resources and skills Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share their creations, explaining the process they have used.	Uses software under the control of the teacher to create, store and edit digital content using appropriate file and folder names. (An intro to digital art) (Making multimedia stories) (Exploring Digital Sound) Understands that people interact with computers. Talks about their work and makes changes to improve it. (An intro to digital art) (Making multimedia stories) (Exploring Digital Sound)	Appreciates that programmes can work with different types of data. (Finding & Presenting Information) Recognises that data can be structured in tables to make it useful. (Finding & Presenting Information) Distinguishes between some of these forms and can explain the different ways that they communicate information. (Intro to Animation) (Finding & Presenting Information) (Writing in Different Styles) (Beginning to Present) Obtains content from the world wide web using a web browser. (Finding & Presenting Information) Recognises and can use a range of input and output devices. Navigates the web	Knows why sorting data in a flat file can improve searching for information. (Databases) Uses filters or can perform single criteria searches for information. (Databases) Uses a variety of software to manipulate and present digital content; data and information. (Databases) (Communication & Collaboration) Shares their experiences of technology in school and beyond the classroom. (Communication & Collaboration) Shows an awareness of, and can use a range of internet services, e.g. VOIP. Collects, organises and presents data	Makes appropriate improvements to solutions based on feedback received, and can comment on the success of the solution. (Collaborative Websites) (3D Design – Sketch Up) Recognises the audience when designing and creating digital content. (Searching the Web) (Collaborative Websites) Uses criteria to evaluate the quality of solutions, can identify improvements making some refinements to the solution, and future solutions.	Makes appropriate improvements to solutions based on feedback received, and can comment on the success of the solution. (Collecting, testing and presenting data) Creates digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience e.g. blogging. (Collecting, testing and presenting data) Makes appropriate improvements to solutions based on feedback received, and can comment on the success of the solution. (Manipulating Sound)	Makes appropriate improvements to solutions based on feedback received, and can comment on the success of the solution. (Manipulating Images) (Video Editing) Knows the difference between physical, wireless and mobile networks. (Inside the Internet) Recognises the audience when designing and creating digital content. (Inside the Internet)

				<p>and can carry out simple web searches to collect digital content. (Finding & Presenting Information)</p> <p>Uses software under the control of the teacher to create, store and edit digital content using appropriate file and folder names. (Intro to Animation) (Finding & Presenting Information) (Writing in Different Styles) (Beginning to Present)</p> <p>Uses a variety of software to manipulate and present digital content; data and information. (Finding & Presenting Information)</p> <p>Understands that people interact with computers. Talks about their work and makes changes to improve it. (Intro to Animation) (Finding & Presenting Information) (Writing in Different Styles) (Beginning to Present)</p>	<p>and information in digital content. (Databases) (Communication & Collaboration)</p> <p>Creates digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience. E.g. Blogging. (Databases) (Communication & Collaboration)</p> <p>Talks about their work and makes improvements to solutions based on feedback received. (Communication & Collaboration)</p> <p>Makes appropriate improvements to solutions based on feedback received, and can comment on the success of the solution. (Communication & Collaboration)</p>	<p>(Lego WeDo - Give it a scratch) (Kodu Sports)</p>	<p>(Collecting, testing and presenting data.)</p> <p>Knows the difference between physical, wireless and mobile networks. (What is a computer?)</p> <p>Uses criteria to evaluate the quality of solutions, can identify improvements making some refinements to the solution, and future solutions. (Kodu – 3D Pac Man) (Programming Robots)</p> <p>Knows that there is a range of operating systems and application software for the same hardware. (What is a computer?)</p>	
DIGITAL LITERACY	Start taking part in some group activities which they make up for themselves, or in teams.	See themselves as a valuable individual. Build constructive and respectful relationships.	Knows common uses of information technology beyond the classroom. (Exploring Machines we Control.)	Understands the importance of communicating safely and respectfully online, and the need for keeping personal information private.	Demonstrates use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online.	Demonstrates use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online. (Searching the Web)	Recognises what is acceptable and unacceptable behaviour when using technologies and online services (Collecting, testing and presenting data.)	Makes judgements about digital content when evaluating and repurposing it for a given audience. (Inside the Internet)

	<p>Increasingly follow rules, understanding why they are important</p> <p>Do not always need an adult to remind them of a rule.</p> <p>Talk about their feelings using words like 'happy', 'sad', 'angry' or 'worried'. • Begin to understand how others might be feeling.</p> <p>Continue to develop positive attitudes about the differences between people.</p>	<p>Express their feelings and consider the feelings of others.</p> <p>Show resilience and perseverance in the face of challenge.</p> <p>Identify and moderate their own feelings socially and emotionally.</p> <p>Think about the perspectives of others.</p> <p>Manage their own needs.</p> <p>Know and talk about the different factors that support their overall health and wellbeing: sensible amounts of 'screen time'</p> <p>Show an understanding of their own feelings and those of others, and begin to regulate their behaviour accordingly.</p>	<p>Shares their use of technology in school. (Exploring Machines we Control.)</p> <p>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. (Covered at the beginning of every topic – Safer Internet Day)</p>	<p>(Finding & Presenting Information) (Beginning to Present)</p> <p>Demonstrates use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online. (Finding & Presenting Information)</p> <p>Knows what to do when concerned about content or being contacted. (Finding & Presenting Information) (Programming with ScratchJnr)</p> <p>Shares their use of technology in school. (Programming with ScratchJnr)</p> <p>Shows and awareness for the quality of digital content collected. (Finding & Presenting Information)</p>	<p>(Communication & Collaboration)</p> <p>Shows and awareness for the quality of digital content collected. (Communication & Collaboration)</p> <p>Recognises what is acceptable and unacceptable behaviour when using technologies and online services. (Communication & Collaboration)</p>	<p>Shows and awareness for the quality of digital content collected. (Searching the Web)</p> <p>Recognises what is acceptable and unacceptable behaviour when using technologies and online services. (Searching the Web) (Collaborative Websites)</p> <p>Makes judgements about digital content when evaluating and repurposing it for a given audience. Demonstrates responsible use of technologies and online services, and knows a range of ways to report concerns. Selects, combines and uses internet services. Understands the potential of information technology for collaboration when computers are networked. (Searching the Web) (Collaborative Websites)</p>		<p>Demonstrates responsible use of technologies and online services, and knows a range of ways to report concerns. Selects, combines and uses internet services. (Inside the Internet)</p> <p>Understands the potential of information technology for collaboration when computers are networked (Inside the Internet)</p>
<p>Teaching Online Safety</p> <p>Autumn – E-Safety Spring – Computing Summer – Wellbeing</p>			<p>Aut – Unsafe Communication.</p> <p>Spr – Personal Data</p> <p>Sum – Online vs Offline behaviour</p>	<p>Aut – Challenges</p> <p>Spr – Password Phishing</p> <p>Sum – Impact on quality of life, physical and mental health and relationships.</p>	<p>Aut – Fake profiles</p> <p>Spr – Age Restrictions Fake websites and scam emails</p> <p>Sum – Online vs. offline behaviour</p>	<p>Aut – Content which incites</p> <p>Spr – Disformation, misinformation and hoaxes. Privacy settings</p> <p>Sum – Impact on quality of life,</p>	<p>Aut – Live streaming.</p> <p>Spr – Content – how can it be used and shared? Targeting of online content – including social media and search engines</p>	<p>Aut – Abuse (online) Grooming</p> <p>Spr – Fraud (online) Persuasive design</p> <p>Sum – Impact on confidence – including body confidence</p>

						physical and mental health and relationships.	Sum – Online vs. offline behaviours	
Organisation and Communication			Aut 1 – Action Algorithms Aut 2 – An intro to digital art. Spr 1 – Exploring Machines we control. Spr 2 – Programming Direction Sum 1 – Making multimedia stories Sum 2 – Exploring digital sound.	Aut 1 – Programming with Logo Aut 2 – Intro to Animation Spr 1 – Finding & Presenting Information Spr 2 – Programming with Scratch Jnr Sum 1 – Writing in different styles Sum 2 – Beginning to present	Aut 1 – Real life algorithms Aut 2 – Lego WeDo Spr 1 – Databases Spr 2 – Programming with Scratch – Maze Games Sum 1 – Getting started with Kodu Sum 2 – Communication & Collaboration	Aut 1 – Scratch – programming animation Aut 2 – Lego WeDo – Give it a scratch Spr 1 – Searching the Web Spr 2 – 3D Design – Sketch up Sum 1 – Kodu Sports Sum 2 – Collaborative Websites	Aut 1 – Programming Robots Aut 2 – Manipulating Sound Spr 1 – Collecting, testing, presenting data. Spr 2 – Raspberry Pi Sum 1 – Kodu 3D Pac Man Sum 2 – What is a computer?	Aut 1 – Sonic Pi Aut 2 – Manipulating Images Spr 1 – Video Editing Spr 2 – SATS Sum 1 – Raspberry Pi Sum 2 – Inside the internet
Overarching vocabulary	Control Information Internet Program Technology	Algorithm Data Debug Online Repeat Search Selection Sequence	Browser Computer networks Execute Input Loop Output Software World Wide Web Web browser	Abstraction Block Blocks Palette Browser Command Condition Control Block Costume Decomposition Digital content Evaluation Logic Logical reasoning PageRank Patterns Processor Procedure Repetition (sometimes referred to as 'iteration' in upper KS2) Script Scripts area Server Services Simulation Software Sprite Stage Variables	Abstraction Array CPU CSS GPU Hard drive Hardware HTML Iteration List Operating system RAM ROM			