Skills & Knowledge progression: Computing

National Curriculum aims & purpose:	School aims - skills, attitudes and knowledge that we would like all children to develop on their journey through the school
Equipping pupils to use computational thinking and creativity to understand and change the world. Pupils are taught the principles of information and computation, how digital systems work, and how to put the knowledge to use. Building on this, pupils are equipped to use IT to create programs and a range of content, and to be digitally literate. Aims: • Understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation • Analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems • Evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems • Are responsible, competent, confidence and creative users of information and communication technology	We want to help our children to become confident, independent users of IT across the curriculum and in their life beyond school. At Bedwell, children in every class and year group will be given opportunities to discover how IT can support them in their learning, and will be encouraged to enthusiastically try out new technologies, apps and software. They will gain the transferable skills needed to adapt to ever-changing software, and be as prepared as they can be for the technologies that they will encounter as they grow up, the vast majority of which probably haven't even been invented yet. Crucial to much of this is the ability to think logically and to break ideas down into discrete steps, as recognised in the National Curriculum, and these computer science skills are therefore a vital strand in our teaching. Our children will also know how to use all of this safely and responsibly, know who to talk to when they come across something that doesn't seem right, fair, acceptable or appropriate, and know when to turn off the technology and walk away. They will be taught to treat others with respect, too, and recognise that behaviour online should be no different to behaviour in 'real life'.

Links to learning in EYFS:	Links to other subjects / curriculum areas:	Experiences every child should have:
Understanding the World : Technology • Knows how to operate simple equipment • Shows an interest in technological toys with knobs or pulleys, or real objects such as cameras or mobile phones • Shows skill in making toys work by pressing parts or lofting flaps to achieve effects such as sound, movements or new images • Knows information can be retrieved from computers • Completes a simple program on a computer • Uses ICT hardware to interact with age-appropriate computer software	• Presenting work from across the curriculum (using digital cameras, video, 2Simple software, Word, Publisher, PowerPoint, Excel or similar) • Using online simulations to explore ideas in science or geography • Using the internet as a search tool to support learning across the curriculum (needs to be a taught skill if this is to be effective) • Using spreadsheets & databases to analyse and explore data (particularly in maths and science) • Using apps to support learning (eg. Mathletics) • eSafety aspects have strong PSHE link	• Creating videos and sharing them with friends and family • Seeing something move in response to their commands • Produce something of their own that makes them go 'Wow!' • Chances to try things out, go wrong & discover that the computer doesn't blow-up and the internet doesn't shut down as a result

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Opportunities to develop and use Learning Powers in our curriculum
Claudia Curiosity   • Exploring the capabilities, possibilities and limitations of new technologies, apps and software   • Having chances to try things out, go wrong and take risks   • Using the internet to answer questions and search for new knowledge   • Learning to use simulations to explore ideas   • Challenging the accuracy of information found online and recognise why different search engines or sites may give different answers
Isaac Independence   • Learning to use IT safely and responsibly (in all situations & lessons - not just Computing)   • Knowing who to talk to when something doesn't seem safe, fair or appropriate   • Developing basic IT skills, so that all children can use technology independently   • Designing and writing programs independently   • Choosing when, where and how to use technology
Eddy Empathy   • Recognising the consequences of actions in eSafety contexts - what effect might this post, image or comment have on someone else? How is it likely to make them feel?   • Designing games with the user in mind - how will they interact with the game? Will it make sense to them (and seem both fun and fair)? Are the controls intuitive?   • Taking the interests of others into account when presenting, editing or sharing work
Polly Perseverance   • Coping with setbacks, particularly when programming - being resilient when code doesn't behave as expected the first time around   • Collecting data over extended periods of time   • Maintaining attention on a long-term project (eg. designing, programing and revising a game over the course of several weeks)   • Setting ambitious goals for a task - what does technology allow us to do that wouldn't have been possible otherwise?
Ralph Reflectiveness   • Breaking complex problems down into small steps and developing logical thinking   • Debugging programs - suggesting how a series of instructions could be changed to correct errors   • Evaluating work, using personal or shared criteria   • Planning and storyboarding video sequences   • Taking feedback into account when developing projects
Chloe Cooperation   • Treating others with respect, recognising that behaviour online should be no different to behaviour in real life   • Presenting and sharing work with others, using video, audio and images   • Adding content to a shared class site, wiki or blog   • Working in teams to complete complex tasks (eg. film projects, which could not be completed independently)   • Discussing and understanding the nature of privacy online

Skills Progression: Computing

Year group	Computer Science : Programming & logic	Information Technology : Creating & using content	Using the Internet : Searching & sorting	eSafety : Being careful & considerate
Year 1	• Begin to break problems down into a series of steps (eg. sequence of instructions for Bee Bot to achieve given goal) • Suggest what outcome a given sequence of instructions (algorithm) might have • Suggest how instructions could be changed to correct errors (debugging)	• Log into computer using own name • Open a file in a given location • Save their work • Type names, captions and labels in simple software • Draw pictures using paint software - including changing colours & using fill tools • Begin to combine text and images		• Understand that they need to keep safe when using IT • Know that they should close lid of laptop if they find inappropriate images • Recognise that information found or transmitted online can be seen by others - eg. images found online can be seen by others too & search strings can be seen by those running the search engine
Year 2	• Recognise algorithms as sequences of instructions • Program a sequence of instructions on screen to complete a given task (eg. using Scratch & Bee Bots) • Debug and adapt programs • Begin to explain how a program works (identifying the purpose of different steps)	• Open and save work to a given location independently • Use digital cameras, video cameras and / or microphones to collect and create content • Combine images and text using real-world applications to present and share their work across the wider curriculum • Create and edit simple charts (eg. findings in science)	• Know that the internet is made up of content shared by people and organisations for a variety of reasons • Know that images, video & other content may be shared by adults, older siblings etc - and that they are not yet old enough to do this themselves • Search for images linked to work in the wider curriculum	• Understand that some information is private and should not be shared online • Recognise that images and work found online belongs to the person who created it and should not be copied without permission • Know what to do if they find anything they find upsetting or inappropriate online
Year 3	• Design and write a program using a block language (eg. Scratch). This is likely to include movement and dialogue / sound, and produce an outcome on screen • Explore on-screen simulations of physical systems (eg. car going around a track) and discuss what they have learnt • Use logical reasoning to detect errors in a program	• Use office software (Word, Excel, PowerPoint or similar) independently to share and present work. • Change font, font size, colour, bold, italics, page colour etc to support presentation • Plan and shoot video to present work / ideas to an audience, using 'real' contexts from the wider curriculum	• Understand that email messages are sent and received through the internet. • Send and receive emails (in a controlled environment) • Use Google (or similar) to begin to search for information • Recognise that most searches will produce huge amount of results & begin to determine whether a given page is useful	• Understand that not all information shared online is safe or exists for positive reasons • Know how to use email safely • Begin to be aware of need to show respect for others online - eg. asking before posting images / video of others, giving positive feedback • Discuss what behaviour is / is not acceptable online

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Year 4	• Design and write a program using a block language (eg. Scratch) which includes some user interaction (answering questions / controlling sprites etc) • Create simple simulations / prototypes on-screen • Use sequence and repetition in programs • Can detect and correct errors in programs independently	• Use and combine multiple programs / apps to achieve a particular goal (eg. analyse data in a spreadsheet and then create a presentation of their findings; create or record audio and then add this to a video) • Collect and present data digitally (eg. using data loggers, spreadsheets or databases)	• Can form a judgement about whether a web page or other digital content is appropriate or relevant for a given purpose • Work collaboratively to share information through a class wiki / blog • Turn research topics into sensible search strings that produce useful results	• Discuss differences between acceptable and unacceptable behaviour online (including sharing information, commenting on the work of others, an awareness of copyright and ownership of work) • Recognise that people they meet online may not be who they seem, and that information found online may not always be reliable
Year 5	• Write and debug a program using a block language (eg. Scratch) based on their own ideas. • Experiment with computer control / sensing systems (eg. Lego WeDo, Pi2Go, InO-Bot) • Break complex problems down into a series of steps and then plan how each step could be achieved, including the use of repetition and selection	• Choose which software to use to complete a given task (eg. decide whether to use Word, PowerPoint or Publisher to present their work) • Edit images and sound to improve quality or achieve a particular effect. • Take the interests of others into account when presenting, editing and sharing their work	• Begin to have an awareness of how internet searches work, and how they rank results • Decide whether they believe content they come across is reliable and identify the author's viewpoint • Sort pages by their usefulness for a particular task • Plan, add content to and edit a shared website / wiki / class blog	• Act responsibly when using the internet, showing an awareness of both their own safety and the feelings of others • Recognise the importance of strong passwords • Discuss the consequences of particular behaviours when using digital technology • Know how to report concerns in a range of contexts
Year 6	• Design, write and debug a program using a second programming language (eg. Python or TouchDevelop) • Program a control and sensing system (eg. Lego WeDo, Pi2Go, InO-Bot) • Use sequences of commands or blocks, repetition, selection and variables in programs • Take feedback into account when developing projects	• Decide when to use IT in their work, and recognise how it provides advantages over pencil, paper or books in some (but not all) situations • Analyse complex data, eg. providing summary statistics and identifying trends • Edit video to produce short films / adverts or other work linked to the wider curriculum	• Make use of a range of search engines and suggest reasons why they may give different results • Understand that not all questions can be answered using search engines • Explain why different webpages may give different answers to the same question • Summarise findings in their own words	• Think through the consequences of actions when using digital technology (both short– and long-term) • Discuss the nature of privacy online and the potential advantages and disadvantages of handing over personal data to large companies • Know how to report inappropriate content online (eg. to ChildLine or CEOP)