Bill Quay Primary School

Progression in Computing

Reception – Year 6

This document sets out how children's computing capabilities will improve and progress as they go through school. Teachers may need to consider the content of more than one year group in order to cater for those children who are working considerably above or below age-related expectations.

The progression is based around the three strands identified in the Computing Programme of Study: Computer Science, Digital Literacy including E-Safety) and Information Technology. Wherever possible, and particularly within the Information Technology strand, teachers should seek to develop cross-curricular approaches for pupil progression to ensure that learning is set in meaningful contexts, with a purpose, to allow children to make authentic links between topics and subjects.

Progression of computing in Early Years Foundation Stage (EYFS)

	Computer Science	Digital Literacy (including E-Safety)	Information Technology
EYFS	• Give and follow simple instructions in order (algorithms) • Create a short sequence of instructions (algorithms) • Change instructions to create a different outcome (algorithms) • Make a programmable toy move (programming) • Use simple software and tools to make something planned happen • Make choices on-screen about buttons and icons to select • Create, recreate and continue patterns • Sort a set of objects according to criteria • Construct simple pictograms • Know that pictures on a pictogram represent numerical values	• Create shapes and text using digital tools • Use technology to show learning • Talk about different kinds of information such as pictures, words, video and sound • Create simple compositions and record/playback audio • Begin to understand that software and tools can be used to communicate through text, images and sound • Find information using a basic search • Know to ask an adult before going online • Know to tell an adult if they find anything worrying online • Know that they should not talk to anyone they do not know online • Be able to talk about how much time they spend using computers and devices • Be careful using computers and devices • Share the use of computers and devices	• Use a keyboard to make choices • Use the mouse or touch to select icons and items • Move onscreen objects • Talk about the technology used at home and in school • Operate digital equipment • Use technology and digital content to play and learn • Begin to understand that computers can be used to represent real life and imaginary situations • Explore simple computer models and talk about what happens if...

Progression in Computer Science

	Year 1/2	Year 3/4	Year 5/6
Computer Science	• Read a set of instructions and usually predict the correct outcome • Produce a set of instructions that others can usually follow • Understands that computers follow instructions given in a precise way • Produce a sequence of instructions that result in planned outcomes • Program a short a sequence of commands that results in a planned effect • Program and test a simple program • Create algorithms to solve simple problems	• Plan a sequence of instructions • Give a sequence of instructions, some of which are repeated (repetition) and involve choices (selection) e.g.if..then, to make things happen • Program a sequence of commands that results in a planned effect • Program and test a simple program • Use sequence, selection and repetition in computer programs • Predict the outcome of a given algorithm or program and correctly identify if repetition is involved • Understand the difference between the internet and internet services e.g. the world wide web • Identify a number of computing devices inside and outside of the classroom and identify some common forms of input and output • Understand that computers store data as numbers	• Write and amend computer programs • Program a number of algorithms that achieve a specific outcome • Use repetition, variables and conditional statements in computer programs • Test computer programs and correct any errors • Know that the World Wide Web consists of many websites and that web pages can be accessed using the internet • Know that web pages are formatted using a type of 'code' • Write and amend more complex computer programs to create a variety of outcomes • Decompose 'problems' by splitting them into smaller 'problems' and designing solutions for each part • Use iteration (repeats and loops), variables and conditional statements (if..then) in computer programs • Test computer programs and correct most errors

Progression in Digital Literacy (including E-Safety)

	Year 1/2	Year 3/4	Year 5/6
Digital Literacy	• Move around a website using buttons and image links • Find answers to simple questions using a website • Use drawing and text tools to give information • Enter the address (URL) of a website with support • Identify some links within web content and move around them with purpose • Begin to use a range of apps and devices without help • Talk about how useful particular websites have been • Use email to talk and work with others	• Find information by moving around a website using hyperlinks and the back button • Type web addresses into a web browser • Question the reliability of information found online • Create bookmarks/favourites and use them to access websites • Print web pages and copy and paste information into other applications • Describe personal use of technology at school and home • Evaluate their own and other people's work and talk about how they could be improved • Understand that a computer network means connected computers • Understand that you can use the internet for activities other than web browsing • Enter URLs into an address bar of a browser • Know that not all information available online is reliable and therefore needs to be checked	• Use search technology to find things out • Suggest a number of activities that the internet can be used for (e.g. online gaming, voice over internet, email etc.) • Cross-check information provided on one website against multiple alternative sources • Create digital content for specific purposes • Communicate and collaborate using technology and online services • Create simple web content using basic HTML • Know that internet search engines use algorithms to find web content (e.g. web crawling) • Know that search results are organised in order of popularity • Use search technology and clear search terms to view web pages and obtain data • Use a number of internet services (e.g. voice over internet, email etc.) • Create digital content for specific purposes and audiences • Use feedback to improve digital content

E-Safety		
• Give examples of information that is personal • Identify what makes them feel someone is not trustworthy • Know that personal information should only be given to trusted people • Discuss some of the ways to use computers safely • Know to ask permission before using email clients or apps	• Explain why passwords are needed and that they should be kept safe • Follow some e-safety rules • Identify online adverts • Explain why secure passwords are required and why they should be kept private • Use ICT to communicate, talk about some of the risks and act to avoid them • Explain why information online needs to be checked • Give examples of types of things online that permissions may be required for	• Explain why personal information should only be given to trusted sources • Know that some information on the internet may be misleading or inaccurate and must be checked • Can use digital tools to communicate and collaborate effectively online • Give examples of good and poor behaviour online • Talk about the different ways people can be bullied online • Can identify some of the risks associated with work and leisure in a digital society and act to minimise them • Make decisions about information sharing on the sites and services used • Can identify situations of harassment or bullying online • Know that there are tools available to report online abuse

Progression in Information Technology – Skills

		Year 1/2	Year 3/4	Year 5/6
Information Technology - skills	**Digital Media**	• Continue to develop correct use of a keyboard • Begin to use both hands for typing • Select and use appropriate images • Select or record audio to add to work • Add titles or captions to multimedia elements • Use a word processor to create original work • Make use of graphics, video and audio • Navigate around text • Select text • Make simple changes to text, e.g. colour, font and size • Create simple presentations • Save, print, retrieve and amend work	• Continue to develop correct use of a keyboard with increasing speed and accuracy • Vary fonts, colours and effects • Vary layouts, formats, graphics and media for purpose and an intended audience • Change page size and orientation • Cut, copy and paste • Edit work to ensure it is accurate and clear • Import text, audio and graphics from devices, networks or online • Select and import audio • Manipulate images using cropping tools, resize and edit • Use design features such as borders, shading, columns and text boxes • Insert and edit tables • Insert hyperlinks • Create content for an intended audience and improve work to better communicate ideas • Evaluate own and a peer's work and suggest improvements	• Continue to develop correct use of a keyboard with increasing speed and accuracy • Develop and use criteria to evaluate the design of a variety of digital resources • Use hyperlinks in interactive presentations • Develop a consistent style throughout work, e.g. headings, fonts, colour schemes • Import relevant images, audio and video to communicate meaning and enhance work • Format and edit work to improve clarity • Evaluate own and peer's work, suggest and/or effect improvements

Digital Communication	• Contribute ideas to class and group emails, blogs etc. • Send an email, using a subject heading, to a known recipient • Open and reply to an email from an unknown sender • Contribute to a blog or forum • Develop an awareness of appropriate language and etiquette when communicating digitally • Begin to use video calling, if appropriate, to communicate and collaborate with others • Know what to do and who to tell if they see something inappropriate online	• Log on to an email account, open emails, create and send appropriate replies • Forward an email • Attach files to digital communication (e.g. email and/or blogs) • Open and save attachments • Select recipients from lists or address books • Use a range of digital tools to communicate (e.g. contributing to blogs, chatting and commenting) with purpose • Continue to use video calling, if appropriate, to communicate and collaborate with others on projects • Begin to publish their work to a wider audience (e.g. blogs involving more than one school, podcasting etc.)	• Independently use appropriate digital communication to collaborate and communicate inside and outside of school (e.g. emails, chats, blogs, SMS and other digital tools) • Evaluate the effectiveness of a range of digital communication tools • Send group communications and be aware of the implications of replying to all • Continue to use video calling, if appropriate, to communicate and collaborate with others on projects at home and overseas • Publish to a global audience (e.g. podcasting, uploading videos, creating web content)
Online Research	• Use and explore appropriate buttons, arrows, menus and hyperlinks to navigate websites • Use key words search resources • Locate websites specified by teachers using shortcuts and typing the URL into an address bar • Begin to evaluate web content by talking about sites that are the most appropriate/useful • Know what to do and who to tell if they see something inappropriate online	• Use a range of appropriate search engines to locate digital media • Evaluate search engines • Develop key questions and key words to search for specific information • Consider the effectiveness of key words on search results and refine where necessary • Verify the accuracy and reliability of information, distinguish between fact/opinion and question sources • Save, retrieve and use accessed information, e.g. through history, bookmarks, copy/paste and 'Save As' • Identify whether content has copyright restrictions and can be legally downloaded and used • Identify and cancel unwanted advertising, pop-ups and downloads – circumventing pop-ups and buttons • Know how to allow useful pop-ups • Know what to do and who to tell if they see something inappropriate online	• Choose to use online sources, where appropriate, for research and resources • Develop use of more advanced searching techniques e.g. including or omitting certain phrases or words • Choose the most appropriate search engine techniques for a task, e.g. image search, searching within a specific site • Use appropriate strategies for finding, evaluating and verifying information • Distinguish between fact and opinion and make informed choices about the sources of online information to use • Understand that domain name extensions can be used to help evaluate online information (e.g. .co.uk, .com, .ac, .sch, .org, .gov, .net) • Question the origin of web content and understand that key information can be checked to help evaluate reliability such as domain name, author, dates, links and contact details • Know what to do and who to tell if they see something inappropriate online

Data Handling	• Sort and classify a variety of items and/or objects • Use digital tools to produce basic graphs (e.g. pictograms and bar charts) • Use graphs to ask and answer questions • Save, retrieve and edit work	• Create diagrams and graphs to answer questions • Begin to identify what data should be collected to answer a specific question • Collect data and enter it into a database • Search and sort a database to answer questions • Use data to formulate questions that can be answered with search criteria • Use and compare graphs and charts produced by database software • Select and use appropriate methods to organise, present and interpret data	• Construct, refine and interpret graphs and charts • Design questions and perform searches on more than one criteria on more complex databases; identifying patterns and relationships • Check the reliability of the data; identify and correct errors • Present data to a given audience and display findings using other digital tools	
Spreadsheets		• Explore the effects of changing variables in spreadsheets asking 'What if?' questions • Make and test predictions • Use a spreadsheet to record data, answer questions and generate graphs • Use spreadsheets to explore relationships and patterns • Change the contents of a cell in a spreadsheet and explore the consequences	• Explore the effects of changing variables in spreadsheets • Make and test predictions • Enter formulae into a spreadsheet to explore the effects of changing variables (e.g. simple calculations) • Identify and enter formulae into cells • Develop simple spreadsheets to investigate problems	

Progression in Information Technology – Knowledge and Understanding

		Year 1/2	Year 3/4	Year 5/6
Information Technology – knowledge and understanding	**Digital Media**	→ **Year 1:** • Know that text can be different colours and sizes • Know that audio, text and images can be used together • Talk about the effects that using audio, text and images together can have • Understand that some digital media might need permission to use • Understand the need to be careful when searching online for digital media • Talk about what they should do if they find anything unsuitable or upsetting online → **Year 2:** • Know that text can be different colours, sizes and styles can be changed • Know that multimedia includes, audio, text and images • Know that IT can be used to communicate ideas by combining digital media • Talk about the particular effects that combining digital media may have • Understand that images, audio and text cannot always be used without permission • Understand the need for caution when searching online for digital media and know what to do if they find unsuitable content	→ **Year 3:** • Understand that some content that uses multimedia (e.g. presentations and/or webpages) looks better and is more efficient that others • Understand that digital media can be varied according to audience (e.g. reporting and advertising) • Understand that IT can automate manual processes (e.g. cut/paste; find/replace) • Develop an awareness of audience • Understand that text and digital media may be subject to copyright • Understand the need to be careful when searching online → **Year 4:** • Recognise the features of good design in using multimedia (e.g. presentations and/or webpages) • Consider the use of appropriate features for a given audience (e.g. reporting, advertising, instructing) • Use IT to automate some processes (e.g. use cut/paste; find/replace etc) • Develop an increasing awareness of audience and discuss the impact that choices have on the end product • Understand that text and digital media may be subject to copyright and abide by rules in producing work • Understand the need for caution when searching online and talk about what to do if they find unsuitable content	→ **Year 5:** • Demonstrate an awareness of audience in work • Understand the importance of evaluation and editing to enhance work • Understand the potential for digital media to inform or persuade and understand that multi-media can combined for particular audiences and purposes • Understand that text, video, images and audio can be subject to copyright and permission may be needed to use the work of others → **Year 6:** • Independently select the most appropriate IT tools for an intended purpose and audience • Independently evaluate work for purpose and audience and improve/enhance work • Use digital media to inform or persuade and combine text, images, video and audio creatively for different audiences and purposes • Understand and abide by copyright rules when creating digital media • Conduct online searches safely and seek appropriate help when necessary

Digital Communication

→ **Year 1:**	→ **Year 3:**	→ **Year 5:**
• Understand that messages can be sent using devices between people • Understand that some messages may be mean or inappropriate • Understand that messages can be in the form of video, images, audio, text or a combination of those • Understand that some information is personal and should not be shared without permission • Understand that some situations may be risky when communicating online • Talk about their use of digital communication in school and at home	• Understand that some messages may be malicious or inappropriate and recognise that attachments may be unsafe to open • Understand the need to be responsible and use appropriate language when communicating with others • Respect the ideas and communications of others • Understand the need to keep personal information and passwords private • Know how to respond if asked for personal details • Understand the risks in meeting anyone in real life that they have met online • Recognise that cyber bullying is unacceptable • Understand the need for rules when using live forms of communication	• Understand that some messages may be malicious or inappropriate and recognise that attachments may be unsafe to open • Identify different purposes of digital communications and their possible benefits • Understand the need to respect the privacy of others • Understand the possible benefits of using a nickname online • Recognise that other people may not be who they say they are online and try to make contact • Understand the risks associated with meeting anyone in person that they have met online • Recognise that cyber bullying is unacceptable • Understand that they should not post images of other people or tag them without their permission • Know that content posted online can be difficult to remove and can be viewed by people other than their friends
→ **Year 2:**	→ **Year 4:**	→ **Year 6:**
• Understand that messages can quickly be sent electronically over distances and that people can reply to them • Understand that an email has to be sent to a unique email address and that it is important to enter them accurately • Understand that some emails may be malicious or inappropriate and the need to cautious • Understand that personal information (e.g. usernames, passwords, email addresses, home addresses, telephone numbers etc) should not be shared either online or offline without a trusted adult's permission • Recognise situations where they don't feel safe and know how to seek help • Know they should tell a trusted adult immediately if they are asked by someone they have met online to meet in person	• Demonstrate caution when communicating online • Recognise the effect that content in their communications may have on others • Demonstrate respect for the ideas and communications of others • Know a number of risks associated with meeting people in real life that they have been communicating with online • Know that they should tell a trusted adult immediately if they are asked to meet in person • Know that cyber bullying can come in various forms and that it is unacceptable • Know how to report cyber bullying • Discuss the differences between online communication tools used in school and those used at home (e.g. social media)	• Understand the potential benefits and risks of digital communication and that methods will vary according to purpose • Understand that social networks or other online environments have settings which can be altered to protect themselves • Know how to protect their own and other's privacy • Understand the benefits of using a pseudonym and/or online personal for online use and when it could be appropriate • Understand that some malicious people may use various techniques to make online contact • Know not to meet anyone they have met online, in person, without telling a trusted adult • Know how to report cyber bulling • Know the need to obtain permission for posts contain images or personal information of others

		• Know that content posted online can be permanent

Online Research	→ **Year 1:** • Understand that IT can give access to information, including the internet • Talk about use of IT and other ways of finding things out (e.g. looking in books) • Understand that text, images, audio and video can be used to impart information • Talk about when some forms of information may be more appropriate than others in a given situation (e.g. when video may be better than using text) • Understand that websites have a unique address • Begin to understand that not everything online is true • Understand the need to be careful when online → **Year 2:** • Understand that IT can give rapid access to a wide variety of information and resources, including the internet • Find things out using IT and other resources (e.g. using books) • Understand that information can come in many forms (e.g. text, images, audio and video) • Know that some forms of information are more appropriate than others in some situations • Understand that websites have a unique address and the need for accuracy when entering it into an address bar • Understand that not everyone online is true • Know not to click/tap buttons on pop-ups and to alert a trusted adult if a pop-up is displayed	→ **Year 3:** • Understand how search engines work • Begin to recognise that anyone can author content online • Understand that web content can be filtered and that this may not be the case at home • Begin to understand that not everything online can be used without permission • Understand the need to ignore unwanted advertising as they may be a source of adware or malicious software → **Year 4:** • Understand that information found as a result of using a search engine is ranked on relevance • Understand that anyone can author content online and that it is not always accurate and may be inappropriate • Know that web content can be filtered and that this may not be the case at home • Begin to understand the concept of copyright (e.g. what content can be used in their own work) • Be aware that copying text directly from any source without permission is theft (plagiarism) • Ignore unwanted advertising and understand the risks of clicking links within them	→ **Year 5:** • Understand that the internet can be used for research • Understand the concept of copyright • Understand that effective online research does not consist of direct copying, but involves gathering a number of sources and evaluating them for validity and effectiveness • Understand that linking to the work of others online (rather than copying it) protects the author's work • Talk about the validity, reliability and relevance of online content → **Year 6:** • Understand when, and where, the internet can be used for research • Understand the concept of copyright and how it applies to material they would like to use • Understand the need to obtain permission when using the work of others online; but know that it is safe to link to the resources without obtaining permission • Collate, evaluate and interpret online content for relevance and suitability to own work • Critically evaluate the validity, reliability and relevance of online content

	Year 1:	Year 3:	Year 5:

Data Handling

→ **Year 1:**
- Understand that IT can be used to sort items and information
- Understand that simple graphs and charts represent information
- Begin to understand that data needs to entered accurately to be used to answer questions correctly

→ **Year 2:**
- Understand that IT can be more efficient than manual methods for sorting and classifying
- Understand that IT can be used to create, display, add to and change graphs
- Understand that simple graphs and charts can be used to ask and answer questions

→ **Year 3:**
- Understand that data is structed in a database
- Recognise similarities and differences between computerised and paper-based databases
- Understand that a database consists of records and fields
- Talk about the advantages of using databases
- Understand that there are different types of data (e.g. numbers and text)
- Begin to make choices about how to present data

→ **Year 4:**
- Understand the need to structure data in a database
- Know, understand and use the vocabulary: file, record, field, sort and search
- Talk about the advantages of using databases to sort, query and classify information quickly
- Understand different data types: numeric; alphabetic, dates, currency
- Know that databases can be used to create a variety of tables and graphs that can be used for different purposes

→ **Year 5:**
- Recognise the need for accuracy when entering and querying data
- Understand that incorrect conclusions can be drawn from inaccurate data
- Understand that IT enables large quantities of data to be organised and sorted
- Understand the basic principles of data protection

→ **Year 6:**
- Recognise the need for accuracy when designing, entering and querying data
- Recognise the consequences of using inaccurate data
- Discuss how IT enables large quantities of data to be organised and sorted and discuss the advantages
- Understand the need for data protection and some of the rights of individuals over stored data and how it affects the use and storage of data
- Understand where and when it is appropriate to use a spreadsheet to support an investigation and explain choices
- Understand that spreadsheets can automate functions, making it easier to test variables
- Understand that spreadsheets can be used to explore mathematical models
- Understand the need for accuracy when entering formulae
- Understand the consequences of using inaccurate data and/or formulae

Spreadsheets			• Understand that spreadsheets can represent real or imagined situations and how these can be useful • Understand that spreadsheets allow changes to be made quickly and easily and compare this to real life situations • Understand that changes made to one element of a spreadsheet can impact on other calculations.	• Understand when and where it is appropriate to use a spreadsheet model or a simulation to support an investigation and explain choices • Understand that spreadsheets can automate functions, making it easier to test variables • Understand that spreadsheets can be used to explore mathematical models • Understand the need for accuracy when entering formulae • Understand the consequences of using inaccurate data and/or formulae