Bugle School

Curriculum Overview 2024-25
Digital Learning Cornwall mixed age planning

	EYFS	Year 1/2	Year 3/4	Year 4/5	Year 6
Computer Science: Programming, including Controlling Hardware	Computational thinking Children explore a range of computational thinking related learning, featuring lots of non-screen, practical activities. Key concepts that these activities link clearly to: *logic *debugging *algorithms * repetition *commands *modifying code	Year 2 Programming A: Scratch Jr Children take on-screen programming further. Children continue to use programming blocks to use, modify, and create programs. Children create algorithms or multiple algorithms. They practise predicting the behaviour of simple programs. They practise debugging (finding and fixing problems) within programs they have created. **CURRICULUM MILESTONES:** *I can create and run a program (an algorithm or multiple algorithms that can be understood by a computer)* *I can predict the behaviour of simple programs* *I can debug (find and fix a problem) within a simple program*	Year 4 Programming A: Repetition with Shapes Children will create programs by planning, modifying, and testing commands to create shapes and patterns. Children will use a text-based programming language. *Alternative:* Sphero Programmable Hardware Children programme Sphero programmable hardware. Children will create programs by planning, modifying, and testing commands to create shapes and patterns. Children will use block-based coding. **CURRICULUM MILESTONES:** *I can create a program that uses loop commands to achieve a particular outcome* *I can recognise that the order of commands may produce a different outcome* *I can identify a way to refactor (improve) my code*	Programming A: Selection with Microbits Children use physical computing to explore programming concepts, namely loops, conditions and variables. Children consider the concept of a digital assistant and how a Microbit might be coded to function in this way. Children explore code for a rock-paper-scissors game, played on the Microbit, and create the code for programming a bread timer. Children explore the radio signal function on Microbits, understanding how radio signals can be triggered and received. Finally, children create and modify a kick strength data logger. **CURRICULUM MILESTONES:** *I can create and modify a count or event-controlled loop* *I can use a condition in an 'if... then... else...' statement to produce given outcomes* *I can create my own variable for use in a program*	Year 6 Programming A: Variables in games Children explore the concept of variables in programming. First, pupils will learn what variables are, and relate them to real-world examples of values that can be set and changed. Children will then use variables to create a simulation of a scoreboard. With the *Use-Modify-Create* model, children will experiment with variables in an existing project, then modify them. They will create their own project and apply their knowledge of variables and design to improve a created game. **CURRICULUM MILESTONES:** *I can create my own variable in a program* *I can program the way that a variable changes* *I can use the value of a variable as a trigger for another event*

		Year 2 Programming B: Robot Algorithms	Year 4 Programming B: Repetition in games	Year 5 Programming B: Selection in Quizzes	Year 6 Programming B: Microbits – Getting Active
		Pupils develop their understanding of instructions in sequences and the use of logical reasoning to predict outcomes. Pupils use given commands in different orders to investigate how order can affect outcome. They will design algorithms and then test those algorithms as programs and debug them. CURRICULUM MILESTONES: I can predict the behaviour of simple programs I can create and run a program (an algorithm or multiple algorithms that can be understood by a computer) I can debug (find and fix a problem) within a simple program	Children will continue to explore the concept of repetition in programming using an on-screen coding environment. Children will compare and contrast this coding environment with the one they explored previously, noting similarities and differences between the two environments. Children look at the difference between count-controlled and infinite loops, and use their knowledge to modify existing animations and games using repetition. Children will design and create a game which uses repetition, applying stages of programming design throughout. CURRICULUM MILESTONES: *I can create a program that uses loops to achieve a particular outcome* *I can recognise that some programs can be run at the same time (concurrency)* *I can explain the outcome of changes to code*	Pupils develop their knowledge of 'selection' by revisiting how 'conditions' can be used in programming, and then learning how the 'if... then... else...' structure can be used to select different outcomes depending on whether a condition is 'true' or 'false'. They represent this understanding in algorithms, and then by constructing programs using an on-screen programming environment. They learn how to write programs that ask questions and use selection to control the outcomes based on the answers given. They use this knowledge to design a quiz in response to a given task and implement it as a program. To conclude the unit, children evaluate their program by identifying how it meets the requirements of the task, the ways they have improved it, and further ways it could be improved. CURRICULUM MILESTONES: *I can use selection in my programs.* *I can create an 'if... then... else...' statement that will result in different outcomes* *I can explain that instructions in a program will produce specific outcomes* *I can create and modify a count or event-controlled loop*	Children explore projects related to fitness and activity using programmable Microbit hardware. Children will further their understanding of variables – how they are created, how they can change, and how they can trigger events – while engaging in fitness-based projects that include the sensing of movement. As well as expanding their understanding of variables, children move their knowledge of selection and loops onwards. Understanding these concepts through the medium of programmable hardware gives this unit meaningful real-world relevance. CURRICULUM MILESTONES: *I can use variables of my own creation within my programs* *I can program the way that a variable changes* *I can program and debug multiple functions on programmable hardware*

Computer Science: Data & Information	Data & information Children explore a range of mostly non-screen based activities related to data gathering and information	**Year 1** Data & information: Grouping Data Pupils are introduced to labelling, grouping and searching - important aspects of data and information. Pupils will begin by using labels to put objects into groups, and labelling these groups. They will demonstrate that they can count a small number of objects, before and after the objects are grouped. Pupils will begin to demonstrate their ability to sort objects into different groups, based on the properties they choose. Finally, pupils will use their ability to sort objects into different groups to answer questions about data. CURRICULUM MILESTONES: *I can place items into groups* *I can decide on labels for groups*	**Year 4** Data & Information: Data Logging Children will consider how and why data is collected over time. Children will consider the senses that humans use to experience the environment and how computers can use special input devices called sensors to monitor the environment. Children will collect data as well as access data captured over long periods of time. They will look at data points, data sets, and logging intervals. Children will spend time using a computer to review and analyse data. Towards the end of the unit, children will pose questions and then use data loggers to automatically collect the data needed to answer those questions. *Alternative with Hardware:* Microbit Data Handling Children work through data handling concepts systematically, utilising the features of Microbit hardware. Children tackle the question of *What is data?* before looking at the code used to create a temperature sensor. Children consider the design process involved in creating a gadget that can measure and act upon data. Children work to understand conditions and selection within their code. CURRICULUM MILESTONES: I can use a digital device to collect data automatically I can choose how often to collect data samples	**Year 6** Data & Information: Spreadsheets Children are introduced to the fundamental operations of spreadsheets. They will be supported in organising data into columns and rows to create their own data set. Children will be taught the importance of formatting data to support calculations, while also being introduced to formulas and will begin to understand how they can be used to produce calculated data. Children will be taught how to apply formulas that include a range of cells, and apply formulas to multiple cells by duplicating them. Children will use spreadsheets to plan an event and answer questions. Finally, children will create graphs and charts, and evaluate their results in comparison to questions asked. CURRICULUM MILESTONES: *I can collect data and enter it into a spreadsheet* *I can recognise that data can be calculated using different operations* *I can apply a formula to calculate the data I need to answer questions*	**Year 6** Focus on Operational Core Skills Children will look critically at their written on-screen pieces, and re-order on-screen sentences for clarity, purpose or effect. They will be able to type at speed, with accurate spelling and a range of correctly incorporated punctuation. Children will use digital spelling checkers and thesaurus facilities with confidence.

	EYFS	Year 1/2	Year 3/4	Year 4/5	Year 6
Information Technology: Computer Systems & Contexts	IT Around Us
Children explore a range of mostly non-screen based activities that relate to devices, IT concepts and related vocabulary. | Year 2
IT Around us: Computer Systems & Networks
Children will look at information technology at school and beyond, in settings such as shops, hospitals, and libraries. Children will investigate how information technology improves our world, and they will learn about using information technology responsibly.

CURRICULUM MILESTONES:

I can identify information technology in the school, home, and beyond

I can create rules for using technology safely | Year 3
IT Around Us: Connecting Computers
Children develop their understanding of digital devices, considering inputs, processes, and outputs. Children compare digital and non-digital devices. Following this, children are introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. The unit concludes with children discovering the benefits of connecting devices to a network.

CURRICULUM MILESTONES:

I can identify networked devices around me

I can identify inputs and outputs of common computing devices | Year 5
IT Around Us: Systems & Searching
Children develop their understanding of computer systems and how information is transferred between systems and devices. Children consider small-scale systems as well as large-scale systems. They explain the input, output, and process aspects of a variety of different real-world systems. Children discover how information is found on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines.

CURRICULUM MILESTONES:

I can explain that a search engine uses web crawlers to create an index

I can explain that a search engine follows rules to rank results | Year 6
IT Around Us: Communication & Collaboration
Children learn about the World Wide Web as a communication tool. First, they will learn how we find information on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines. They will then investigate different methods of communication, before focusing on internet-based communication. Finally, they will evaluate which methods of internet communication to use for particular purposes.

CURRICULUM MILESTONES:

I understand that computer systems transfer information over networks in data packets

I understand that internet connected programs allow us to work together (collaborate) |
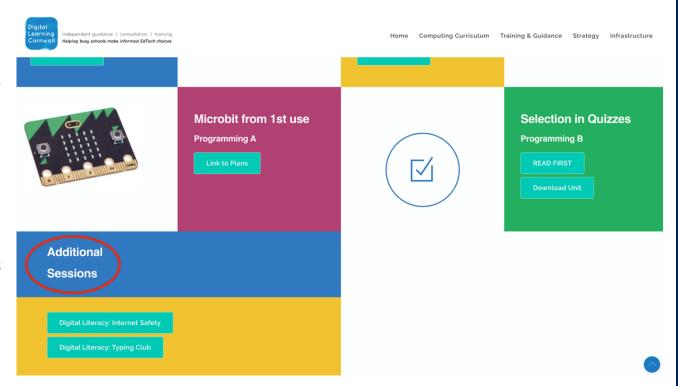
Information Technology: Digital Media	**Media & Sound Foundations** Children explore a range of mostly non-screen based activities that relate to: painting, pattern making, real / not real, sound making and music.	**Year 1** Digital Design: Digital Photography Children will learn to recognise that different devices can be used to capture photographs and will gain experience capturing, editing, and improving photos. Finally, they will use this knowledge to recognise that images they see may not be real.	**Year 3** Digital Design: Animation Children will use a range of techniques to plan and create stop-frame animations. Next, they will apply those skills to create a story-based animation. Children will add other types of media to their animation, such as music and text.	**Year 5** Digital Design: Vector Graphics Children will find out that vector images are made up of shapes. They will learn how to use the different drawing tools and how images are created in layers. They will explore the ways in which images can be grouped and duplicated to support them in creating more complex pieces of work.	**Year 6** Digital Design: 3D Modelling Children will develop their knowledge and understanding of using a computer to produce 3D models. Children will initially familiarise themselves with working in a 3D space, including combining 3D objects to make a house and examining the differences between working digitally with 2D and 3D graphics. Children will progress to making accurate 3D models of physical objects, such as a pencil holder, which include using 3D objects as placeholders. Finally, children will examine the need to group 3D objects, then go on to plan, develop, and evaluate their own 3D model.
		CURRICULUM MILESTONES: *I can use technology to capture and manipulate (position, re-size, rotate) photos as part of a piece of work* *I can describe ways in which people might make themselves look different online*	**CURRICULUM MILESTONES:** *I can design and plan for an animation (e.g. stop-frame animation on an iPad)* *I can create and edit an animation*	**CURRICULUM MILESTONES:** *I can create a vector drawing that is comprised of lines and shapes (objects) of different colours* *I can resize, duplicate, rotate, align and colour objects in vector drawings* *I can use grouping and layers in my vector drawing*	**CURRICULUM MILESTONES:** *I can modify and adjust objects in a 3D space.* *I can recognise the difference when working with 3D objects in comparison to 2D shapes.*

		Year 1	Year 3	Year 6	Year 5
		Digital Design: Digital Writing	Digital Design: Book Creator	Digital Design: Web Page Creation	Digital Design: Video Editing
		Children will develop their understanding of the various aspects of using a computer to create and manipulate text. Children will become familiar with using a keyboard and trackpad/mouse to enter and remove text. Children will also consider how to change the look of their text, and will be able to justify their reasoning in making these changes.	Children will develop their understanding of the creation and manipulation of text. Children will increase their confidence and abilities with keyboard typing, including grammar and punctuation. Children will experiment with pictorial elements and design features. Children will have the opportunity to publish their work to the world wide web.	Children learn how to create websites for a chosen purpose. Children identify what makes a good web page and use this information to design and evaluate their own website. Throughout the process, children pay specific attention to copyright and fair use of media, the aesthetics of the site, and navigation paths.	Children have the opportunity to learn how to create short videos in groups. As they progress, they will develop the skills and processes of capturing, editing, and manipulating video. Active learning is encouraged through guided questions and by working in small groups to investigate the use of devices and software. Children are guided to take their idea from conception to completion. The use of green screen may be incorporated into this sequence of learning, giving an opportunity for children to use cross-curricular knowledge and giving extra purpose.
		CURRICULUM MILESTONES:	CURRICULUM MILESTONES:	CURRICULUM MILESTONES:	CURRICULUM MILESTONES:
		I can choose letters on a keyboard to create words	*I can create audio using digital technology*	*I can recognise the components of a web page layout*	*I can edit video, bringing together different media elements to produce an effective final product.*
		I can save and retrieve work that I have produced (includes auto-save)	*I can edit and adjust audio using digital technology*	*I can devise my own web design which contains clear navigation structures (menus, hyperlinks etc.)*	*I can combine a variety of software (programs that run on computers) to accomplish given goals.*
				I can recognise the implications of linking to (and using) content owned by other people	

Digital Literacy including Internet Safety

Digital Literacy is split into *Operational Core Skills* and *Internet Safety*.

The following *Operational Core Skills* tasks and objectives are featured and interwoven within specific Computing units, extending coverage well above what is featured in the national curriculum. Schools may also wish to teach operational core skills more explicitly, e.g. brief typing practise sessions.

Internet Safety tasks often find crossover and incorporation into a school's PSHE delivery. We feature a separate page of resources for each year group.

The 'Additional Sessions' section of the Computing curriculum (at the bottom of each year-group page) provides advice and guidance on the delivery of all of these extra sessions).

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Digital Literacy		Operational Core Skills Children will use websites and apps to aid their learning. Children are able to save and retrieve work they have produced. Children learn to move a cursor with the trackpad on a laptop,	Operational Core Skills Children will develop their understanding of creating and manipulate text further. Children will become familiar with using a keyboard to enter, edit and remove text. Children will also consider how to change the appearance of text, and will be able to justify their reasoning in making such changes. Children will consider the differences between using a computer to create text, and handwritten approaches.

Children practise key skills such as two-finger scrolling, use of the shift key for capital letters, and deleting chosen parts of on-screen text. | Operational Core Skills Children use software to edit and improve written work from a cross-curricular subject. Children develop their use of the shift key, using numerous basic punctuation marks correctly within their on-screen writing. Children type to achieve a completed written piece that can be printed or published directly to the internet. Children use specific typing software to improve keyboard skills and awareness. | Operational Core Skills Children further improve their ability to type towards completed work, including more advanced punctuation marks and accuracy. Children use digital spell-check facilities to locate and correct spelling mistakes. Children will use multiple tabs within a web browser or move between different apps as part of a task. | Operational Core Skills Children will become confident and competent users of web-based programs and apps, combining numerous web-based programs and/or apps to accomplish goals. Children hone and improve their ability to type and improve on-screen written work, and continue to access typing practise software to develop this area. Children use digital thesaurus facilities to replace words and phrases with better choices. | Operational Core Skills Children will look critically at their written on-screen pieces, and re-order on-screen sentences for clarity, purpose or effect. They will be able to type at speed, with accurate spelling and a range of correctly incorporated punctuation. Children will use digital spelling checkers and thesaurus facilities with confidence. |
| | | Operational Core Skills Children use hand-eye coordination to operate devices such as touch-screens and touchpads | | | | | |
| | Internet Safety Children explore internet safety concepts at an appropriate level through retelling of stories and discussion. Children explore safe use of technology along with other physical items within their settings, | Internet Safety Children give examples of when and how to speak to an adult when they need to.

Children recognise some ways in which the internet can be used to communicate.

Children describe what information I should not put online without asking a trusted adult first.

Children describe how to behave online in ways that do not upset others | Internet Safety Children describe ways in which people might make themselves look different online.

Children explain some risks of communicating online with others they don't know well.

Children explain how information put online about them can last for a long time. | Internet Safety Children describe ways in which media can shape ideas about gender.

Children explain how their own and other people's feelings can be hurt by what is said or written online.

Children know who they should ask if they are not sure if they should put something online. | Internet Safety Children explain how their online identity can be different to the identity they present in 'real life'.

Children explain what it means to 'know someone' online and why this might be different from knowing someone in real life.

Children describe how they can find out information about someone by looking online. | Internet Safety Children explain how identity online can be copied, modified or altered.

Children explain how impulsive and rash communications online may cause problems.

Children describe ways that information about people online can be used by others to make judgments about an individual.) | Internet Safety Children explain how they can represent themselves in different ways online.

Children demonstrate how they would support others (including those who are having difficulties) online.

Children describe some simple ways that help build a positive online reputation. |

		Children identify devices they could use to access information on the internet. Children explain rules to keep us safe when we are using technology both in and beyond the home. Children identify some simple examples of personal information (e.g. name, address, birthday, age, location). Children name their work so that others know it belongs to them.	Children describe how to behave online in ways that do not upset others. Children demonstrate how to navigate a simple webpage to get to information they need (e.g. home, forward, back buttons; links, tabs and sections). Children create rules for using technology safely Children explain why they should always ask a trusted adult before they share information about themselves online. Children recognise that content on the internet may belong to other people.	Children describe rules about how to behave online and how to follow them. Children evaluate digital content and can explain how to make choices from search results. Children identify situations where they might need to limit the amount of time they use technology. Children describe simple strategies for creating and keeping passwords private. Children explain why copying someone else's work from the internet without permission can cause problems.	Children explain why they need to think carefully about how content they post might affect others, their feelings and how it may affect how others feel about them (their reputation). Children analyse information and differentiate between 'opinions', 'beliefs' and 'facts'. Children understand what criteria have to be met before something is a 'fact'. Children describe ways technology can affect healthy sleep and can describe some of the issues. Children explain how internet use can be monitored. Children assess and justify when it is acceptable to use the work of others.	Children explain how they would report online bullying on the apps and platforms that they use. Children explain why lots of people sharing the same opinions or beliefs online does not make those opinions or beliefs true. Children describe common systems that regulate age-related content (e.g. PEGI, BBFC, parental warnings) and describe their purpose. Children explain how lots of free apps or services may read and share private information (e.g. friends, contacts, likes, images, videos, voice, messages, geolocation) with others. Children demonstrate the use of search tools to find and access online content which can be reused by others.	Children identify a range of ways to report concerns both in school and at home about online bullying. Children demonstrate strategies to enable them to analyse and evaluate the validity of 'facts. Children explain why using these strategies are important. Children assess and action different strategies to limit the impact of technology on their health (e.g. nightshift mode, regular breaks, correct posture, sleep, diet and exercise). Children describe ways in which some online content targets people to gain money or information illegally; children describe strategies to help them identify such content (e.g. scams, phishing). Children demonstrate how to make references to and acknowledge sources they have used from the internet.