



The Computing Curriculum at Sheepscombe Primary School

The Sheepscombe School Community believes that:

The Sheepscombe School community believes that there is a balance to be found between the need for children to be digitally literate without excessive dominance of screen time in the curriculum. Alongside programmes such as [] and Mathletics that help secure core skills in English and Maths, we will use information technology in ways that foster creativity, and in general will deploy screen use in a way that supports our offline learning rather than governs or dominates it.

We will make appropriate use of IT for opportunities to expand our children's communication skills, and to provide complementary outlets and opportunities for art and design. Our IT curriculum will have close linkage with the maths curriculum and computational thinking, and we will explore logic in the digital sphere by having fun with coding and robotics. We will learn about and celebrate the human achievements that have been made possible through the development of computers and the internet. Through age-appropriate advice, we will ensure that our children know how to operate safely in the online world.

As a result, by the time our children leave in Year 6, they are competent users of information technology, and can apply computational thinking to solve problems; they are individuals who have been encouraged to explore the creative potential of information technology, without becoming reliant upon it, and can operate safely and confidently in the digital sphere.

National Curriculum – Aims

The national curriculum for computing aims to ensure that all pupils: can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation; can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems; can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems; are responsible, competent, confident and creative users of information and communication technology

National Curriculum – Purpose of Study

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

Early Years Foundation Stage

Computing may not be part of the EYFS Statutory Framework, but there is much that goes on in the EYFS that provides a foundation for computational thinking. We provide a rich environment in which children can build up an understanding of the technological world through play. We help children to be curious about technology in real world contexts. We would worry about an environment, at home or school, in which young children are spending too much time 'plugged in' to screens, narrowing communication and the range of practical experiences from which children learn. An education without technology would be an education that seems to diminish relevance to the modern world; a digital only education would also be a hugely impoverished early childhood experience. Young children should also be learning outside, making mud pies, making dens, sharing books, making models and chatting with their friends. There are a wide range of digital technologies that young children can use playfully and collaboratively, such as digital cameras, audio recorders, tablets, computers, phones and simple, programmable robots. The use of technology can support children across other areas of learning, providing children with new ways to communicate and share their ideas. In the 'creating with materials' strand of the 'expressive arts and design' area of learning, the early learning goal states the expectation that children can safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function and share their creations, explaining the process they have used. The requirement doesn't specify digital media or information technology, but nor does it preclude it. Alongside working with crayons, pencils, paints and craft materials, there's ample opportunity for children to use photography, record music they make, video one another and paint with fingers, trackpad or mouse on screen.

In EYFS and KS1 all children will: use equipment and software confidently, safely and purposefully, to communicate and handle information and to support their problem solving, recording and expressive skills.

In Key Stage 2 all children will: become digitally literate and be able to join the rest of the world on its digital platform. They will be equipped, not only with the skills and knowledge to use technology effectively and for their own benefit, but more importantly – safely. The biggest impact we want on our children is that they understand the consequences of using the internet and that they are also aware of how to keep themselves safe online. Children will develop the ability to explore the Internet and the future of technology. They will learn to present, print and store information using word processing, spreadsheets and presentation. By the time they reach the end of year 6 our children will show competence in coding for a variety of practical and inventive purposes, including the application of ideas within other subjects. They will have developed the ability to connect with others safely and respectfully, understanding the need to act within the law and with moral and ethical integrity.

Merlin Class				Kestrel Class		Eagle Class	
Little Lambs	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
COMPUTER SCIENCE Online Programming - Begin to talk about good & bad choices in real life e.g. taking turns, saying	COMPUTER SCIENCE Hardware - Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary.	COMPUTER SCIENCE Hardware - Learning how to operate a camera or tablet to take photos and videos.	COMPUTER SCIENCE Hardware - Understanding what a computer is and that it's made up of different components.	COMPUTER SCIENCE Hardware – N/A Networks and data	COMPUTER SCIENCE Hardware - Understanding what the different components of a computer do and how they work together.	COMPUTER SCIENCE Hardware - Learning that external devices can be programmed by a separate computer.	COMPUTER SCIENCE Hardware - Learning about the history of computers and how they have evolved over time.

kind things, helping others, telling an adult if something upsets you Programming - Begin to help adults operate equipment around the school, operating simple equipment with support With support, press buttons on a beebot to make it move and talk about the movements <u>INFORMATION TECHNOLOGY</u> Multimedia - Begin to recognise images and sound when using ICT Begin to use a camera or sound recorder to collect photos or sound Make choices about picture backgrounds and sounds on an app or interactive board <u>DIGITAL LITERACY</u> Technology - Begin to recognise purposes for using technology in school and at home	Recognising and identifying familiar letters and numbers on a keyboard. Developing basic mouse skills such as moving and clicking. Networks and data Representation - N/A Computational thinking - Using logical reasoning to understand simple instructions and predict the outcome. Programming - Following instructions as part of practical activities and games. Learning to give simple instructions. Experimenting with programming a Bee-bot/Blue- bot and learning how to give simple commands. Learning to debug instructions, with the help of an adult, when things go wrong. <u>INFORMATION TECHNOLOGY</u> Using software - Using a simple online paint tool to create digital art. Using internet searches - N/A Using data - Representing data through sorting and categorising objects in unplugged scenarios. Representing data through physical pictograms. Exploring branch databases through physical games. <u>DIGITAL LITERACY</u> Learning to log in and log out. Computing systems and networks - To be able to understand what a computer keyboard is and recognising some letters and numbers. To know that a mouse can be used to click, drag and create simple drawings. To know that to use a computer you need to log in to it and then log out at the end of your session. Programming - To know that being able to follow and give simple instructions is important in computing. To understand that it is important for instructions to be in the right order. To understand why a set of instructions may have gone wrong. To know that you can program a Bee-Bot with some simple commands. To understand that debugging means how to fix some simple programming errors. To understand that an algorithm is a set of clear and precise instructions. Creating media – N/A Data handling - To know that sorting objects into various categories can help you locate information. To know that using yes/no questions to find an answer is a branching database.	Learning how to explore and tinker with hardware to find out how it works. Recognising that some devices are input devices and others are output devices. Learning where keys are located on the keyboard. Networks and data Representation - N/A Computational thinking - Learning that decomposition means breaking a problem down into smaller parts. Using decomposition to solve unplugged challenges. Using logical reasoning to predict the behaviour of simple programs. Developing the skills associated with sequencing in unplugged activities. Following a basic set of instructions. Assembling instructions into a simple algorithm. Programming - Programming a Floor robot to follow a planned route. Learning to debug instructions when things go wrong. Using programming language to explain how a floor robot works. Learning to debug an algorithm in an unplugged scenario. <u>INFORMATION TECHNOLOGY</u> Using software - Using a basic range of tools within graphic editing software. Taking and editing photographs. Developing control of the mouse through dragging, clicking and resizing of images to create different effects. Developing understanding of different software tools. Using internet searches - Recognising devices that are connected to the internet. Using data - Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. Using representations to answer questions about data. Using software to explore and create pictograms and branching databases. <u>DIGITAL LITERACY</u> Logging in and out and saving work on their own account. Computing systems and networks - To know that "log in and log out" means to begin and end a connection with a computer.	Recognising that buttons cause effects and that technology follows instructions. Learning how we know that technology is doing what we want it to do via its output. Using greater control when taking photos with cameras, tablets or computers. Developing confidence with the keyboard and the basics of touch-typing. Networks and data Representation - N/A Computational thinking - Articulating what decomposition is. Decomposing a game to predict the algorithms used to create it. Learning that there are different levels of abstraction. Explaining what an algorithm is. Following an algorithm. Creating a clear and precise algorithm. Learning that programs execute by following precise instructions. Incorporating loops within algorithms. Programming - Using logical thinking to explore software, predicting, testing and explaining what it does. Using an algorithm to write a basic computer program . <u>INFORMATION TECHNOLOGY</u> Using software - Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. Using word processing software to type and reformat text. Creating and labelling images. Using internet searches - N/A Using data - Collecting and inputting data into a spreadsheet. Interpreting data from a spreadsheet. Wider use of technology - Learning how computers are used in the wider world. <u>DIGITAL LITERACY</u> Learning how to create a strong password. Understanding how to stay safe when talking to people online and what to do if they see or hear something online that makes them feel upset or uncomfortable Identifying whether information is safe or unsafe to be shared online.	Representation - Understanding the role of the key components of a network. Identifying the key components within a network, including whether they are wired or wireless. Understanding that websites and videos are files that are shared from one computer to another. Learning about the role of packets. Understanding how networks work and their purpose. Recognising links between networks and the internet. Learning how data is transferred. Computational thinking - Using decomposition to explain the parts of a laptop computer. Using decomposition to explore the code behind an animation. Using repetition in programs. Using logical reasoning to explain how simple algorithms work. Explaining the purpose of an algorithm. Forming algorithms independently. Programming - Using logical thinking to explore more complex software; predicting, testing and explaining what it does. Incorporating loops to make code more efficient. Continuing existing code. Making reasonable suggestions for how to debug their own and others' code. <u>INFORMATION TECHNOLOGY</u> Using software - Taking photographs and recording video to tell a story. Using software to edit and enhance their video adding music, sounds and text on screen with transitions. Using internet searches - N/A Using data - N/A Wider use of technology - N/A <u>DIGITAL LITERACY</u> Computing systems and networks - To know what a tablet is and how it is different from a laptop/desktop computer. To understand what a network is and how a school network might be organised. To know that a server is central to a network and responds to requests made. To know how the internet uses networks to share files. To know that a router connects us to the internet. To know what a packet is and why it is important for website data transfer. To know the roles that inputs and outputs play on computers.	Drawing comparisons across different types of computers. Learning about the purpose of routers. Networks and data Representation - Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration. Computational thinking – In the Scratch environment and using decomposition to solve a problem by finding out what code was used. Using decomposition to understand the purpose of a script of code. Identifying patterns through unplugged activities. Using past experiences to help solve new problems. Using abstraction to identify the important parts when completing both plugged and unplugged activities. Programming - Creating algorithms for a specific purpose. Coding a simple game. Using abstraction and pattern recognition to modify code. Incorporating variables to make code more efficient. Remixing existing code. <u>INFORMATION TECHNOLOGY</u> Using software - To appreciate the internet as a network of networks which need to be kept secure. To learn that the World Wide Web is part of the internet, and have opportunities to explore the World Wide Web for in order to learn about who owns content and what they can access, add, and create. Using internet searches - Understanding that information found by searching the internet is not all grounded in fact. Using data - N/A Wider use of technology - Understanding that software can be used collaboratively online to work as a team. <u>DIGITAL LITERACY</u> Recognising that information on the internet might not be true or correct and that some sources are more trustworthy than others. Learning to make judgements about the accuracy of online searches. Identifying forms of advertising online. Recognising what appropriate behaviour is when collaborating with others online. Reflecting on the positives and negatives of time spent online. Identifying respectful and disrespectful online behaviour.	Recognising how the size of RAM affects the processing of data. Networks and data Representation - Learning the vocabulary associated with data: data and transmit. Recognising that computers transfer data in binary and understanding simple binary addition. Relating binary signals (Boolean) to the simple character-based language, ASCII. Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations. Computational thinking - Predicting how software will work based on previous experience. Writing more complex algorithms for a purpose. Programming - Iterating and developing their programming as they work. Confidently using loops in their programming. Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected. Writing code to create a desired effect. Using a range of programming commands. Using repetition within a program. Amending code within a live scenario. <u>INFORMATION TECHNOLOGY</u> Using software - Building a web page and creating content for it. Use online software for documents, presentations, forms and spreadsheets. Using software to work collaboratively with others. Using internet searches - Developing searching skills to help find relevant information on the internet. Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns. Using data - Understanding how data is collected in remote or dangerous places. Understanding how data might be used to tell us about a location. Wider use of technology - Learn about different forms of communication that have developed with the use of technology. <u>DIGITAL LITERACY</u> Identifying possible dangers online and learning how to stay safe. Evaluating the pros and cons of online communication. Recognising that information on the internet might not be true or correct	Using the understanding of historic computers to design a computer of the future. Understanding and identifying barcodes, QR codes and RFID. Identifying devices and applications that can scan or read barcodes, QR codes and RFID. Networks and data Representation - N/A Computational thinking - Decomposing a program into an algorithm. Using past experiences to help solve new problems. Writing increasingly complex algorithms for a purpose. Programming - Debugging quickly and effectively to make a program more efficient. Remixing existing code to explore a problem. Using and adapting nested loops. Programming using the language Python. Changing a program to personalise it. Evaluating code to understand its purpose. Predicting code and adapting it to a chosen purpose. <u>INFORMATION TECHNOLOGY</u> Using software - Using logical thinking to explore software independently, iterating ideas and testing continuously. Using search and word processing skills to create a presentation. Creating and editing sound recordings for a specific purpose. Using internet searches - Understanding how search engines work. Using data - Understanding how barcodes, QR codes and RFID work. Gathering and analysing data in real time. Creating formulas and sorting data within spreadsheets. Wider use of technology - Learning how 'big data' can be used to solve a problem or improve efficiency. <u>DIGITAL LITERACY</u> Understanding the importance of secure passwords and how to create them. Using search engines safely and effectively. Computing systems and networks - To understand the importance of having a secure password and what "brute force hacking" is. To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2. To know about some of the historical figures that contributed to technological advances in computing.
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	To know that a pictogram is a way of showing information. Online Safety - To understand the difference between online and offline. To understand what information I should not post online.	To know that a computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art. To know that passwords are important for security. To know that when we create something on a computer it can be more easily saved and shared than a paper version. To know some of the simple graphic design features of a piece of online software. Programming - To understand that an algorithm is when instructions are put in an exact order. To know that input devices get information into a computer and that output devices get information out of a computer. To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing. To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'. To understand the basic functions of a Bee-Bot. To know that you can use a camera/tablet to make simple videos. To know that algorithms move a bee-bot accurately to a chosen destination. Creating media – N/A Data handling - To know how that charts and pictograms can be created using a computer. To understand that a branching database is a way of classifying a group of objects. To know that computers understand different types of 'input'. Online Safety - To understand the difference between online and offline. To understand what information I should not post online.	Learning to be respectful of others when sharing online and ask for their permission before sharing content. Learning strategies for checking if something they read online is true. Computing systems and networks - To know the difference between a desktop and laptop computer. To know that people control technology. To know that buttons are a form of input that give a computer an instruction about what to do (output). To know that computers often work together. Programming - To understand what machine learning is and how that enables computers to make predictions. To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times. To know that abstraction is the removing of unnecessary detail to help solve a problem. Creating media – N/A Data handling - To understand that you can enter simple data into a spreadsheet. To understand what steps you need to take to create an algorithm. To know what data to use to answer certain questions. To know that computers can be used to monitor supplies. Online Safety - To understand the difference between online and offline. To understand what information I should not post online. To know what the techniques are for creating a strong password. To know that you should ask permission from others before sharing about them online and that they have the right to say 'no.' To understand that not everything I see or read online is true.	To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together. Programming - To know that Scratch is a programming language and some of its basic functions. To understand how to use loops to improve programming. To understand how decomposition is used in programming. To understand that you can remix and adapt existing code. Creating media – To know that different types of camera shots can make my photos or videos look more effective. To know that I can edit photos and videos using film editing software. To understand that I can add transitions and text to my video. Data handling - To know that a database is a collection of data stored in a logical, structured and orderly manner. To know that computer databases can be useful for sorting and filtering data. To know that different visual representations of data can be made on a computer. Online Safety - To know that not everything on the internet is true: people share facts, beliefs and opinions online. To understand that the internet can affect your moods and feelings. To know that privacy settings limit who can access your important personal information, such as your name, age, gender etc. To know what social media is and that age restrictions apply.	Computing systems and networks - To understand that software can be used collaboratively online to work as a team. To know what type of comments and suggestions on a collaborative document can be helpful. To know that you can use images, text, transitions and animation in presentation slides. Programming - To understand that a variable is a value that can change (depending on conditions) and know that you can create them in Scratch. To know what a conditional statement is in programming. To understand that variables can help you to create a game on Scratch. To know that combining computational thinking skills (sequence, abstraction, decomposition etc) can help you to solve a problem. To understand that pattern recognition means identifying patterns to help them work out how the code works. To understand that algorithms can be used for a number of purposes e.g. animation, games design etc. Creating media – To develop understanding of how digital images can be changed and edited, and how they can then be resaved and reused. To consider the impact that editing images can have, and evaluate the effectiveness of their choices. Data handling - N/A Online Safety - To know that not everything on the internet is true: people share facts, beliefs and opinions online. To understand that the internet can affect your moods and feelings. To know that privacy settings limit who can access your important personal information, such as your name, age, gender etc. To know what social media is and that age restrictions apply.	and learning ways of checking validity. Learning what to do if they experience bullying online. Learning to use an online community safely Computing systems and networks - To know how search engines work. To understand that anyone can create a website and therefore we should take steps to check the validity of websites. To know that web crawlers are computer programs that crawl through the internet. To understand what copyright is. To know the difference between ROM and RAM. Programming - To know how to create a short film/video and that one way of composing these is on programming software. To understand that using loops can make the process simpler and more effective. To know how to adapt their code while performing their video. Creating media – To know some of the features of web design software. To know that a website is a collection of pages that are all connected. To know that websites usually have a homepage and subpages as well as clickable links to new pages, called hyperlinks. To know that websites should be informative and interactive. Data handling - To know that Mars Rover is a motor vehicle that collects data from space by taking photos and examining samples of rock. To know what numbers using binary code look like and be able to identify how messages can be sent in this format. To understand that RAM is Random Access Memory and acts as the computer's working memory. To know what simple operations can be used to calculate bit patterns. Online Safety - To know different ways we can communicate online. To understand how online information can be used to form judgements. To understand some ways to deal with online bullying. To know that apps require permission to access private information and that you can alter the permissions. To know where I can go for support if I am being bullied online or feel that my health is being affected by time online.	To understand what techniques are required to create a presentation using appropriate software. Programming – This unit brings together elements of all the four programming constructs: sequence, repetition, selection and variables. It offers learners the opportunity to use all of these constructs in a different, but still familiar environment, while also utilising a physical device — the micro:bit. The unit begins with a simple program for learners to build in and test in the programming environment, before transferring it to their micro:bit. Creating media – To develop their knowledge and understanding of using a computer to produce 3D models. They 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. Learners will progress to making accurate 3D models of physical objects, such as a pencil holder, which include using 3D objects as placeholders. Creating websites for a chosen purpose. Learners identify what makes a good web page and use this information to design and evaluate their own website using Google Sites. Throughout the process, learners pay specific attention to copyright and fair use of media, the aesthetics of the site, and navigation paths. Data handling - To know that data contained within barcodes and QR codes can be used by computers. To know that infrared waves are a way of transmitting data. To know that Radio Frequency Identification (RFID) is a more private way of transmitting data. To know that data is often encrypted so that even if it is stolen it is not useful to the thief. Online Safety - To know that a 'digital footprint' means the information that exists on the internet as a result of a person's online activity. To know what steps are required to capture bullying content as evidence. To understand that it is important to manage personal passwords effectively. To understand what it means to have a positive online reputation. To know some common online scams.
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