

# Computing Progression of Skills



*"Our DREAM is for greatness in our learning. To BELIEVE, in our unique talents and gifts and ACHIEVE a better world, living life to the full."*

Computer Science

Computer Systems and Networks

	Year A	Year B
EYFS	<p>To locate relevant keys To log in and log out. To develop basic mouse skills such as moving and clicking. To use a simple online paint tool to create digital art. Learning how to explore and tinker with hardware to develop familiarity To operate a camera and/or iPad and use it to take photographs.</p>	
KS1	<p>Understanding what a computer is and that it is made up of different components. 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 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. Learning how computers are used in the wider world</p>	<p>Learning how to explore and tinker with hardware to find out how it works. Learning where keys are located on the keyboard. Using a basic range of tools within graphic editing software. Developing control of the mouse through dragging, clicking and resizing images to create different effects. Developing an understanding of different software tools. Recognising devices that are connected to the internet. Logging in and out and saving work on their own account.</p>
LKS2	<p>Learning about the purpose of routers. Understanding the role of the key components of a network. 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. Identifying the key components within a network, including whether they are wired or wireless.</p>	<p>Understanding that computer networks provide multiple services, such as the world wide web, and opportunities for communication and collaboration. Use online software for documents, presentations, forms and spreadsheets. Using software to work collaboratively with others. Understanding that software can be used collaboratively online to work as a team.</p>

	<p>Recognising links between networks and the internet. Learning how data is transferred.</p> <p>Understanding what the different components of a computer do and how they work together. Drawing comparisons across different types of computers. Using decomposition to explain the parts of a laptop computer. Explaining the purpose of an algorithm</p>	<p>Recognising what appropriate behaviour is when collaborating with others online.</p>
UKS2	<p>Developing searching skills to help find relevant information on the internet. Learning how to use search engines effectively to find information, focus on keyword searches and evaluate search returns. Learn about different forms of communication that have developed with the use of technology. Recognising that information on the Internet might not be true or correct and learning ways of checking validity.</p>	<p>Learning about the history of computers and how they have evolved over time. Using past experiences to help solve new problems. Writing increasingly complex algorithms for a purpose. Debugging quickly and effectively to make a program more efficient. Remixing existing code to explore a problem. Changing a program to personalise it. Evaluating code to understand its purpose. Predicting code and adapting it to a chosen purpose. Using search and word processing skills to create a presentation. Understanding how search engines work. Using search engines safely and effectively. Understanding the importance of secure passwords and how to create them. Using the understanding of historic computers to design a computer of the future. Planning, recording and editing an audio recording. Creating and editing sound recordings for a specific purpose.</p>

Progression of Knowledge

Computer Science

Computer Systems and Networks

	Year A	Year B
--	--------	--------

EYFS	<p>To know what a keyboard is.</p> <p>Understand why we need to log in and out.</p> <p>To learn what a mouse is.</p> <p>Know that a range of technology is used in places such as homes and schools</p>	
KS1	<p>The difference between a desktop and a laptop computer.</p> <p>People control technology.</p> <p>Some input devices that give a computer an instruction about what to do (output).</p> <p>Computers often work together.</p>	<p>Log in and log out means to begin and end a connection with a computer</p> <p>A computer and mouse can be used to click, drag, fill, select, add backgrounds, text, layers, shapes and clipart.</p> <p>Passwords are important for security and to keep us safe</p>
LKS2	<p>To understand that a network is a group of interconnected devices.</p> <p>To know the components that make up a network (Wireless access point/WAP, Network switch, Router, Server and devices).</p> <p>To know that a server is central to a network and responds to requests made.</p> <p>To know that the internet connects all the networks around the world.</p> <p>To know that a router connects us to the internet.</p> <p>To know what a packet is and why it is important for website data transfer.</p> <p>To know the roles that inputs and outputs play on computers.</p> <p>To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together.</p> <p>To know what a tablet is and how it is different from a laptop/desktop computer.</p>	<p>Software can be used collaboratively online to work as a team.</p> <p>What type of comments and suggestions on a collaborative document can be helpful.</p> <p>You can use images, text, transitions and animation in presentation slides.</p>
UKS2	<p>How search engines work.</p> <p>Anyone can create a website; therefore, people should take steps to check the validity of websites.</p> <p>Web crawlers are computer programs that crawl through the internet.</p> <p>What copyright is</p>	<p>The importance of having a secure password and what brute force hacking is.</p> <p>The first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2.</p> <p>About some of the historical figures that contributed to technological advances in computing.</p> <p>What techniques are required to create a presentation using appropriate software.</p> <p>Sound clips can be recorded using sound recording software.</p> <p>Sound clips can be edited and trimmed.</p>

## Progression of Skills

### Computer Science

#### Programming

	Year A	Year B
EYFS	<p>To follow instructions as part of practical activities and games</p> <p>To give simple instructions</p> <p>To debug when things go wrong</p> <p>To predict the outcome of an algorithm.</p>	
KS1	<p>Developing confidence with the keyboard and the basics of touch typing.</p> <p>Articulating what decomposition is.</p> <p>Decomposing a game to predict the algorithms used to create it.</p> <p>Learning that there are different levels of abstraction.</p> <p>Explaining what an algorithm is.</p> <p>Following an algorithm.</p> <p>Creating a clear and precise algorithm.</p> <p>Learning that programs execute by following precise instructions.</p> <p>Incorporating loops within algorithms.</p> <p>Using logical thinking to explore software, predicting, testing and explaining what it does.</p> <p>Using an algorithm to write a basic computer program.</p> <p>Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts.</p> <p>Recognising that buttons cause effects and that technology follows instruction</p> <p>Explaining what an algorithm is.</p> <p>Following an algorithm.</p> <p>Creating a clear and precise algorithm.</p> <p>Learning that programs execute by following precise instructions.</p> <p>Incorporating loops within algorithms.</p> <p>Using logical thinking to explore software, predicting, testing and explaining what it does.</p> <p>Using an algorithm to write a basic computer program.</p>	<p>Recognising that some devices are input devices and others are output devices.</p> <p>Learning that decomposition means breaking a problem down into smaller parts.</p> <p>Using decomposition to solve unplugged challenges.</p> <p>Developing the skills associated with sequencing in unplugged activities.</p> <p>Following a basic set of instructions.</p> <p>Assembling instructions into a simple algorithm.</p> <p>Learning to debug instructions when things go wrong.</p> <p>Learning to debug an algorithm in an unplugged scenario.</p>

	<p>Using loop blocks when programming to repeat an instruction more than once.</p> <p>Using software (and unplugged means) to create story animations.</p> <p>Learning how to explore and tinker with hardware to find out how it works.</p> <p>Learning how to operate a camera to take photos and videos.</p> <p>Using decomposition to solve unplugged challenges.</p> <p>Using logical reasoning to predict the behaviour of simple programs.</p> <p>Developing the skills associated with sequencing in unplugged activities.</p> <p>Following a basic set of instruction.</p> <p>Assembling instructions into a simple algorithm.</p> <p>Programming a floor robot to follow a planned route.</p> <p>Learning to debug instructions when things go wrong.</p> <p>Using programming language to explain how a floor robot works.</p> <p>Learning to debug an algorithm in an unplugged scenario.</p> <p>Taking and editing photographs</p>	
LKS2	<p>Using decomposition to explore the code behind an animation.</p> <p>Using repetition in programs.</p> <p>Using logical reasoning to explain how simple algorithms work.</p> <p>Explaining the purpose of an algorithm.</p> <p>Forming algorithms independently.</p> <p>Using logical thinking to explore more complex software; predicting, testing and explaining what it does.</p> <p>Incorporating loops to make code more efficient.</p> <p>Continuing existing code.</p> <p>Making reasonable suggestions for how to debug their own and others' code.</p>	<p>Using decomposition to solve a problem by finding out what code was used.</p> <p>Using decomposition to understand the purpose of a script of code.</p> <p>Creating algorithms for a specific purpose.</p> <p>Coding a simple game.</p> <p>Incorporating variables to make code more efficient.</p> <p>Remixing existing code.</p>
UKS2	<p>Predicting how software will work based on previous experience.</p> <p>Writing more complex algorithms for a purpose.</p> <p>Iterating and developing their programming as they work.</p> <p>Confidently using loops in their programming.</p> <p>Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.</p> <p>Writing code to create a desired effect.</p> <p>Using a range of programming commands.</p>	<p>Decomposing a program into an algorithm.</p> <p>Writing increasingly complex algorithms for a purpose.</p> <p>Debugging quickly and effectively to make a program more efficient.</p> <p>Remixing existing code to explore a problem.</p> <p>Using and adapting nested loops.</p> <p>Programming using the language Python.</p> <p>Changing a program to personalise it.</p> <p>Evaluating code to understand its purpose.</p>

	<p>Using repetition within a program.</p> <p>Amending code within a live scenario.</p> <p>Using logical thinking to explore software more independently, making predictions based on their previous experience.</p> <p>Using a software programme (Scratch) to create music.</p> <p>Identify ways to improve and edit programs, videos, images etc.</p>	<p>Using logical thinking to explore software independently, iterating ideas and testing continuously.</p>
--	---	--

## Progression of Knowledge

### Computer Science

#### Programming

	Year A	Year B
EYFS	To know that an algorithm is a set of instructions to carry out a task, in a specific order	
KS1	<p>To understand what machine learning is and how it enables computers to make predictions.</p> <p>To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times.</p> <p>To know that abstraction is the removing of unnecessary detail to help solve a problem.</p> <p>To know that coding is writing in a special language so that the computer understands what to do.</p> <p>To understand that the character in ScratchJr is controlled by the programming blocks.</p> <p>To know that you can write a program to create a musical instrument or tell a joke</p> <p>The basic functions of a Bee-Bot.</p> <p>You can use a camera/tablet to make simple videos.</p> <p>Algorithms move a Bee-Bot accurately to a chosen destination.</p>	<p>An algorithm is when instructions are put in an exact order.</p> <p>Decomposition means breaking a problem into manageable chunks and that is important in computing.</p> <p>We call errors in an algorithm are called bugs and fixing these is called debugging</p>
LKS2	<p>Scratch is a programming language and some of its basic functions.</p> <p>How to use loops to improve programming.</p>	<p>That a variable is a value that can change (depending on conditions) and know that you can create them in Scratch.</p>

	<p>How decomposition is used in programming.</p> <p>That you can remix and adapt existing code</p>	<p>What a conditional statement is in programming.</p> <p>That using variables can help you to create a quiz on Scratch.</p>
UKS2	<p>That a soundtrack is music for a film/video and that one way of composing these is on programming software.</p> <p>Loops can make the process of writing music simpler and more effective.</p> <p>How to adapt their music while performing.</p>	<p>To know that there are text-based programming languages such as Logo and Python.</p> <p>To know that nested loops are loops inside of loops.</p> <p>To understand the use of random numbers and remix Python code.</p>

## Progression of Skills

### IT

#### Data Handling

		Year A	Year B
EYFS			
KS1			<p>Developing confidence with the keyboard and the basics of touch typing.</p> <p>Creating and labelling images.</p> <p>Collecting and inputting data into a spreadsheet.</p> <p>Interpreting data from a spreadsheet.</p> <p>Learning how computers are used in the wider world.</p>
LKS2			<p>Using tablets or digital cameras to film a weather forecast.</p> <p>Understanding that weather stations use sensors to gather and record data that predicts the weather.</p> <p>Using keywords to effectively search for information on the internet.</p> <p>Searching the internet for data.</p> <p>Designing a device that gathers and records sensor data.</p> <p>Recording data in a spreadsheet independently.</p> <p>Sorting data in a spreadsheet to compare using the 'sort by...' option.</p> <p>Understanding that data is used to forecast weather.</p>
UKS2			<p>Understanding and identifying barcodes, QR codes and RFID.</p> <p>Identifying devices and applications that can scan or read barcodes, QR codes and RFID.</p> <p>Understanding how barcodes, QR codes and RFID work.</p> <p>Gathering and analysing data in real time.</p> <p>Creating formulas and sorting data within spreadsheets.</p> <p>Learning how 'big data' can be used to solve a problem or improve efficiency.</p> <p>Learning that a separate computer can program external devices.</p> <p>Recognising how the size of RAM affects the processing of data.</p>



		<p>Learning the vocabulary associated with data: data and transmit.</p> <p>Recognising that computers transfer data in binary and understanding simple binary addition.</p> <p>Relating binary signals (Boolean) to the simple character-based language, ASCII.</p> <p>Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations.</p> <p>Understanding how data is collected in remote or dangerous places.</p> <p>Understanding how data might be used to tell us about a location.</p> <p>Learn about different forms of communication that have developed with the use of technology.</p>
--	--	--

## Progression of Knowledge

### IT

#### Data Handling

	Year A	Year B
EYFS		
KS1		<p>Simple data can be entered into a spreadsheet.</p> <p>What steps are needed to take to create an algorithm.</p> <p>What data to use to answer certain questions.</p> <p>Computers can be used to monitor supplies</p>
LKS2		<p>To know that computers can use different forms of input to sense the world around them so that they can record and respond to data ('sensor data').</p> <p>To know that a weather machine is an automated machine that respond to sensor data.</p> <p>To understand that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films.</p>
UKS2		<p>Data contained within barcodes and QR codes can be used by computers.</p> <p>Infrared waves are a way of transmitting data.</p> <p>Radio Frequency Identification (RFID) is a more private way of transmitting data.</p> <p>Data is often encrypted so that even if it is stolen it is not useful to the thief.</p> <p>Mars Rover is a motor vehicle that collects data from space by taking photos and examining rock samples.</p>

		<p>What numbers using binary code look like and be able to identify how messages can be sent in this format.</p> <p>RAM is Random Access Memory and acts as the computer’s working memory.</p> <p>What simple operations can be used to calculate bit patterns.</p>
--	--	---

Progression of Skills

IT

Creating Media

		Year A	Year B
EYFS			
KS1			<p>Learning how to explore and tinker with hardware to find out how it works.</p> <p>Learning where keys are located on the keyboard.</p> <p>Learning how to operate a camera to take photos and videos.</p> <p>Developing the skills associated with sequencing in unplugged activities.</p> <p>Using a basic range of tools within graphic editing software.</p> <p>Taking and editing photographs.</p> <p>Developing control of the mouse through dragging, clicking and resizing images to create different effects.</p> <p>Developing an understanding of different software tools.</p> <p>Searching and downloading images from the internet safely.</p>

		When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable
LKS2	Using logical thinking to explore more complex software; predicting, testing and explaining what it does. Taking photographs and recording video to tell a story. Using software to edit and enhance their video adding music and text on screen with transitions.	
UKS2	Decomposing animations into a series of images. Decomposing a story to be able to plan a program to tell a story. Using video editing software to animate.	

## Progression of Knowledge

### IT

#### Creating Media

	Year A	Year B
EYFS		
KS1		Holding a camera or device still and considering angles and light are important to taking good pictures. Photographs can be edited, cropped and filtered. How to search safely for images online.
LKS2	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.	
UKS2	Decomposition of an idea is important when creating stop-motion animations.	

	<p>Stop-motion animation is filmed one frame at a time using models and with tiny changes between each photograph.</p> <p>Editing is an important feature of making and improving a stop-motion animation</p>	
--	---	--

## Progression of Skills

### Digital Literacy

### Online Safety

	Year A	Year B
EYFS		
KS1	<p>Recognising devices that are connected to the internet.</p> <p>Understanding that we are connected to others when using the internet.</p> <p>Understanding some of the ways we can use the internet.</p> <p>When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable.</p> <p>Understanding how to interact safely with others online.</p> <p>Recognising how actions on the internet can affect others.</p> <p>Recognising what a digital footprint is and how to be careful about posting online.</p> <p>Discussing ways to balance time spent online and offline.</p>	<p>Identifying whether information is safe or unsafe to be shared online.</p> <p>Learning how to create a strong password.</p> <p>Learning to be respectful of others when sharing online and ask for their permission before sharing content.</p> <p>Learning strategies for checking if something they read online is true.</p> <p>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.</p>
LKS2	Recognising how social media platforms are used to interact.	Understanding why some results come before others when searching.

	<p>Recognising that different information is shared online, including facts, beliefs and opinions.</p> <p>Learning how to identify reliable information when searching online.</p> <p>Learning how to stay safe on social media.</p> <p>Considering the impact technology can have on mood</p>	<p>Understanding that information found by searching the internet is not all grounded in fact.</p> <p>Learning to make judgements about the accuracy of online searches.</p> <p>Identifying forms of advertising online.</p> <p>Reflecting on the positives and negatives of time online.</p> <p>Identifying respectful and disrespectful online behaviour.</p> <p>Recognising that information on the Internet might not be true or correct and that some sources are more trustworthy than others.</p>
UKS2	<p>Understand that passwords need to be strong and that apps require some form of password.</p> <p>Recognise some types of online communication and know who to go to if they need help with any communication matters online.</p> <p>Search for simple information about a person, such as their birthday or key life moments.</p> <p>Know what bullying is and that it can occur both online and in the real world.</p> <p>Recognise when health and well-being are being affected in either a positive or negative way through online use.</p> <p>Offer some advice and tips to combat the negative effects of online use.</p>	<p>Learning about the positive and negative impacts of sharing online.</p> <p>Learning strategies to create a positive online reputation.</p> <p>Understanding the importance of secure passwords and how to make them.</p> <p>Learning strategies to capture evidence of online bullying to seek help.</p> <p>Recognising that updated software can help to prevent data corruption and hacking.</p>

## Progression of Knowledge

### Digital Literacy

#### Online Safety

	Year A	Year B
EYFS		
KS1	<p>To know that the internet is many devices connected to one another.</p> <p>To know what to do if you feel unsafe or worried online – tell a trusted adult.</p> <p>To know that people you do not know on the internet (online) are strangers and are not always who they say they are.</p> <p>To know that to stay safe online it is important to keep personal information safe.</p>	<p>To understand the difference between online and offline.</p> <p>To understand what information I should not post online.</p> <p>To know how to create a strong password.</p> <p>To know that you should ask permission from others before sharing about them online and that they have the right to say ‘no.’</p> <p>To understand that not everything I see or read online is true.</p>

	To know that 'sharing' online means giving something specific to someone else via the internet and 'posting' online means placing information on the internet.	
LKS2	<p>That not everything on the internet is true: people share facts, beliefs and opinions online.</p> <p>The internet can affect people's moods and feelings.</p> <p>Privacy settings limit who can access important personal information, such as names, ages, gender etc.</p> <p>What social media is and that age restrictions apply.</p>	<p>Some of the methods used to encourage people to buy things online.</p> <p>Technology can be designed to act like or impersonate living things.</p> <p>Technology can be a distraction and identify when someone might need to limit the amount of time spent using technology.</p> <p>What behaviours are appropriate to stay safe and be respectful online.</p>
UKS2	<p>Possible dangers online and how to stay safe.</p> <p>The pros and cons of online communication.</p> <p>That information on the internet might not be true or correct and ways of checking validity.</p> <p>What to do if they experience bullying online.</p> <p>How to use an online community safely.</p>	<p>A digital footprint means the information that exists on the internet as a result of a person's online activity.</p> <p>What steps are required to capture bullying content as evidence.</p> <p>It is important to manage personal passwords effectively.</p> <p>What it means to have a positive online reputation.</p> <p>Some common online scams.</p>

