WHOLE SCHOOL

COMPUTING PROGRESSION PROGRESSION OF SKILLS

Curriculum Intent

- Ensure our children behave kindly, responsibly and safely online
- Equip children with confidence to use new technologies and software.
- An enjoyable curriculum with clear progression that allows them to succeed now and long after primary school.

COMPUTER SCIENCE	HARDWARE				
YEAR GROUP	KS1	YEAR 3	YEAR 4	YEAR 5	YEAR 6
SKILLS	Learning how to explore and tinker with hardware to find out how it works Understanding that computers and devices around us use inputs and outputs, identifying some of these Learning where keys are located on the keyboard Learning how to operate a camera Understanding what a computer is and that it's 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 tablets or computers Developing confidence with the keyboard and the basics	Understanding what the different components of a computer do and how they work together Drawing comparisons across different types of computers Learning what a server does	Learning about the purpose of routers	Learning that external devices can be programmed by a separate computer Learning the difference between ROM and RAM Recognising how the size of RAM affects the processing of data Understanding the fetch, decode, execute cycle	Learning about the history of computers and how they have evolved over time 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 Acknowledging that corruption can happen within data during transfer (for example when downloading, installing, copying and updating files)

COMPUTER SCIENCE	NETWORKS AND DATA REPRESENTATION				
YEAR GROUP	KS1	YEAR 3	YEAR 4	YEAR 5	YEAR 6
SKILLS	Understanding what the internet is	Learning what a network is and its purpose Identifying the key components within a network, including whether they are wired or wireless Recognising links between networks and the internet Learning how data is transferred	Consolidating understanding of the key components of a network Understanding that websites & videos are files that are shared from one computer to another Learning about the role of packets Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration	Learning the vocabulary associated with data: data and transmit Learning how the data for digital images can be compressed 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 8 characters and carrying out binary calculation Understanding how bit patterns represent images as pixels	Understanding that computer networks provide multiple services

Computer Science	Computational Thinking				
Year Group	KS1	Year 3	Year 4	Year 5	Year 6
Skills	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 Learning that an algorithm is a set of step by step instructions used to carry out a task, in a specific order Follow a basic set of instructions Assembling instructions into a simple algorithm Articulating what decomposition is Decomposing a game to predict the algorithms used to create it Using decomposition to decompose a story into smaller parts Learning what abstraction is Learning that there are different levels of abstraction Explaining what an algorithm is Following an algorithm Creating a clear and precise algorithm Learning that computers use algorithms to make predictions Learning that programs execute by following precise instructions Incorporating loops within algorithms	Using decomposition to explain the parts of a laptop computer. Using decomposition to explore the code behind an animation. Using repetition in programs. Understanding that computers follow instructions. Using an algorithm to explain the roles of different parts of a computer. Using logical reasoning to explain how simple algorithms work. Explaining the purpose of an algorithm. Forming algorithms independently	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.	Decomposing animations into a series of images Decomposing a program without support. Decomposing a story to be able to plan a program to tell a story. Predicting how software will work based on previous experience. Writing more complex algorithms for a purpose	Decomposing a program into an algorithm. Using past experiences to help solve new problems. Writing increasingly complex algorithms for a purpose

Computer Science	Programming				
Year Group	KS1	Year 3	Year 4	Year 5	Year 6
Skills	Programming a Bee-bot/Virtual Bee-bot to follow a planned route Learning to debug instructions when things go wrong Developing a howto video to explain how the Bee-bot works. Learning to debug an algorithm in an unplugged scenario	Using logical thinking to explore more complex software; predicting, testing and explaining what it does Incorporating loops to make code more efficient Remixing existing code Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected	Understanding that websites can be altered by exploring the code beneath the site Coding a simple game Using abstraction and pattern recognition to modify code	Programming an animation Iterating and developing their programming as they work Beginning to use nested loops (loops within loops) Debugging their own code	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

	Using logical thinking to explore software, predicting, testing and explaining what it does Using an algorithm to write a basic computer program Learning what loops are Incorporating loops to make code more efficient		Incorporating variables to make code more efficient Remixing existing code 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	Changing a program to personalise it Evaluating code to understand its purpose Predicting code and adapting it to a chosen purpose Altering a website's code to create changes

Computer Science	Using Software				
Year Group	KS1	Year 3	Year 4	Year 5	Year 6
Skills	Using a basic range of tools within graphic editing software Taking and editing photographs Understanding how to create digital art using an online paint tool Developing control of the mouse through dragging, clicking and resizing of images to create different effects Developing understanding of different software tools Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts Using word processing software to type and reformat text Using software to create story animations Creating and labelling images	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	Building a web page and creating content for it Designing and creating a webpage for a given purpose Use Google online software for documents, presentations, forms and spreadsheets. Work collaboratively with others	Using logical thinking to explore software more independently, making predictions based on their previous experience Using a software programme (Sonic Pi or Scratch) to create music Using video editing software or animation software to animate Identify ways to improve and edit programs, videos, images etc. Independently learning how to use 3D design software package TinkerCAD	

Computer Science	Using email and the internet				
Year Group	KS1	Year 3	Year 4	Year 5	Year 6
Skills	Searching and downloading images from the internet safely Understanding that we are connected to others when using the internet Understanding that personal information should not be shared on the internet. Learning how to be respectful to others when sharing content online.	Learning to log in and out of an email account Writing an email including a subject, 'to' and 'from' Sending an email with an attachment Replying to an email Identifying useful terms and phrases for search engines	Understanding why some results come before others when searching Understanding that information on the internet is not all grounded in fact	Developing searching skills to help find relevant information on the internet Understanding how apps can access our personal information and how to alter the permissions.	Understanding how search engines work

Computer Science	Using Data				
Year Group	KS1	Year 3	Year 4	Year 5	Year 6
Skills	Introduction to spreadsheets Representing data in tables, charts and pictograms Sorting data and creating branching databases Identifying where digital content can have advantages over paper when storing and manipulating data Collecting and inputting data into a spreadsheet Interpreting data	Understanding the vocabulary associated with databases: field, record, data Learning about the pros and cons of digital versus paper databases Sorting and filtering databases to easily retrieve information Creating and interpreting charts and graphs to understand data	Designing a weather station which gathers and records sensor data	Understanding how data is collected	Understanding how barcodes, QR codes and RFID work. Gathering and analysing data in real time Creating formulas and sorting data within spreadsheets

Computer Science	Wider use of technology				
Year Group	KS1	Year 3	Year 4	Year 5	Year 6
Skills	Recognising common uses of information technology, including beyond school Understandin g some of the ways we can use the internet Learning how computers are used in the wider world	Understanding the purpose of emails. Learning what a search engine is Recognising how social media platforms are used to interact	Understanding that software can be used collaboratively online to work as a team	Learn about different forms of communication that have developed with the use of technology.	Learning about the Internet of Things and how it has led to 'big data'. Learning how 'big data' can be used to solve a problem or improve efficiency

Computer Science	Online Safety				
Year Group	KS1	Year 3	Year 4	Year 5	Year 6
Skills	Logging in and out and saving work on their own account Understand the importance of a password 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 Recognising when someone has been unkind online Learning some top tips for staying safe online Understanding how we 'share' information on the internet Understanding that personal information should not be shared on the internet. Learning how to be respectful to others when sharing content online.	Learning to be a responsible digital citizen; understanding their responsibilities to treat others respectfully and recognising when digital behaviour is unkind Learning about cyberbullying Learning that not all emails are genuine, recognising when an email might be fake and what to do about it Learning that not all information on the internet is factual Understanding who personal information should/ should not be shared with	Recognising what appropriate behaviour is when collaborating with others online Recognising that information on the Internet might not be true or correct and that some sources are more trustworthy than others Learning about different forms of advertising on the internet.	Learning about how permissions work and how to change them Identifying possible issues with online communication Considering the effects of screen-time on physical and mental wellbeing Learning about online bullying and where to seek advice	Understanding the importance of secure passwords and how to create them, along with two-step authentication Using search engines safely and effectively Recognising that updated software can help to prevent data corruption and hacking Considering their digital footprint and online reputation and future implications they may have Learning about how to collect evidence and report online bullying concerns