



Subject Intent

Through our computing curriculum at Lisle Marsden we aim to actively seek to prepare our pupils for life in modern Britain and give them the skills that will enable them to embrace and utilise new technology in a socially responsible and safe way. We want them to know the career opportunities that will be open to them if they study computing.

We want the use of technology to support learning across the entire curriculum within an enabling environment that nurtures the potential and talents of all. Not only do we want them to be digitally literate and competent end-users of technology but through our computing lessons we want them to have a breadth of experience, to develop their understanding on how to become members of a wider global community and act as responsible digital citizens.

At Lisle, computing is taught in discreet computing lessons and delivered in a way that ensures progression of skills and knowledge, and follows a sequence to build on previous learning. Our children's learning will progress through the three unit areas of: computer science, information technology and digital literacy.

Subject Sequence

Yr	Term / Unit
EYFS	Using a computer
EYFS	All About instructions
1	Improving mouse skills
1	Algorithms unplugged
2	Word Processing
2	Y2 Programming: Scratch Junior

Yr	Term / Unit
3	Journey Inside the Computer
3	Programming: Scratch
3	Video Trailers
4	Website Design
4	Further Programming: Scratch
4	HTML

Yr	Term / Unit
5	Search Engines
5	Micro:bit
5	Stop Motion Animation
6	Bletchley Park
6	Introduction to Python
6	History of Computers

SUBJECT Rationale

Implementation

The academy follows a broad and balanced Computing curriculum, that builds on previous learning and provides both support and challenge for learners, and has incorporated the three areas of study from the National Curriculum which are: computer science, information technology and digital literacy. Using Kapow Primary, three strands of learning have been followed to ensure curriculum coverage and breadth of study, which are Programming, Creating Media and Computing Systems and Networks. These specific strands are the foundations that we think branch out to other areas of computing, and have cross-curricular links. They enable and encourage creativity, computational thinking, problem solving and allow for children to be prepared to take on future jobs, that we don't even know exist yet. Kapow Primary provides a clear sequence of learning with vocabulary; progression of skills and video resources for teachers, and in some cases pupils too, to support staff professional development and confidence when teaching Computing. Staff will be expected to practice specific skills themselves before teaching. The units, where specific equipment is required in each year group, will be taught at different times across the year so as to manage the physical resources (laptops/Micro-bits) and demand for them.

Computing will be taught discretely but, where appropriate links to other subject areas, will be explicit. We want to ensure that Computing is embedded in our whole school curriculum and that opportunities for enhancing learning by using technology are always taken. The subject will be blocked in line with other foundation curriculum areas to provide the depth of study. The knowledge and skills necessary to succeed through these units, will be progressively built on through the 7 years of the computing curriculum, from EYFS through to Year 6, enabling children to have a deep understanding of digital literacy and online safety, computational thinking and computers and hardware

Impact - what progress will children make?

Our children enjoy and value Computing and know why they are doing things, not just how. Children will understand and appreciate the value of Computing in the context of their personal wellbeing and the technological, creative and cultural industries and their many career opportunities. Progress in Computing is demonstrated through regularly reviewing and scrutinising children's work to ensure that progression of skills is taking place. Namely through:

- Looking at pupils' work, especially over time as they gain skills and knowledge
- Observing how they perform in lessons
- Talking to them about what they know.

The Computing curriculum will contribute to children's personal and spiritual development in creativity, independence, judgement and self-reflection. This would be seen in them being able to talk confidently about their work, and sharing their work with others. Progress will be shown through outcomes and through the important record of the process leading to them.

SUBJECT Progression (Kapow)

Computer Science	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Hardware	❖ 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 a keyboard ❖ Learning how to operate a camera	❖ 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 via its output ❖ Using greater control when taking photos with tablets or computers ❖ Developing confidence with the keyboard and the basics of touch typing	❖ Understanding what the different components of a computer do and how they work together ❖ Drawing comparisons over 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 ❖ Understand the fetch, decode, execute cycle.	❖ Learning about the history of computers and how they have evolved over time ❖ Using the understanding of historical computers to design a computer of the future ❖ Understanding and identifying barcodes, RFID and QR codes ❖ Identifying devices and applications that can scan or read barcodes, RFID and QR codes ❖ Acknowledging that corruption can happen within data during transfer (for example when, downloading, installing, copying and updating files)
Networks and data representation	❖	❖	❖ 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 ❖ Understand that computer networks provide multiple	❖ 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	❖ Understanding that computer networks provide multiple services

				services such as the World Wide Web, and opportunities for communication and collaboration	simple character-based language ASCII ❖ Learning that messages can be sent by binary code, reading binary up to 8 characters and carrying out binary calculations ❖ Understanding how bit patterns represent images as pixels	
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 ❖ 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 ❖ Forming algorithms independently	❖ Solving unplugged problems by decomposing them into smaller parts ❖ Using decomposition to understand the purpose of a script of code ❖ Using decomposition to help solve problems ❖ 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 ❖ Creating algorithms for a specific purpose	❖ Decomposing animations into a series of images ❖ Decomposing a progress 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

Programming	❖ Programming a Beet-bot/blue-bot to follow a planned route ❖ Learning to debug instructions when things go wrong ❖ Developing a how-to-video to explain how the Bee-bot/Blue-bot works ❖ Learning to debug an algorithm in an unplugged scenario	❖ 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	❖ 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 ❖ 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 connected	❖ Programming an animation ❖ Iterating and developing their programming as they work. ❖ Beginning to use nested loops (loops within loops) ❖ Debugging their own code ❖ Writing code to create desired effect ❖ Using a range of programming commands ❖ Using repetition within a program ❖ Amending code within a live scenario ❖	❖ 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 ❖ Altering a websites code to create changes
Information Technology	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Using Software	❖ Using a basic range of tools within a graphic editing software ❖ Taking and editing photographs ❖ Understanding how to create digital art using an online paint tool ❖ Developing control o 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 animation ❖ 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 prediction based on their previous experience ❖ Using software program Sonic Pi to create music ❖ Using the video editing software to animate ❖ Identify ways to improve and edit programs, videos, images etc. ❖ Independently learning how to use	❖ Using logical thinking to explore software independently, iterating ideas and testing continuously ❖ Using search and word processing skills to create a presentation ❖ Planning, recording and editing a radio play ❖ Creating and editing sound recordings for a specific purpose ❖ Creating and editing videos, adding multiple elements: music, voiceover,

					3D design software package TinkerCAD	sound, text and transitions to create a video advert ❖ Using design software TinkerCAD to design a product ❖ Creating a website with embedded links and multiple pages
Using email and the internet	❖ Searching and downloading from the internet safely	❖	❖ 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	❖	❖ 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	❖ Understanding how search engines work
Using Data	❖ Introduction to spreadsheets ❖ Representing data in tables, charts and pictograms ❖ Sorting data and creating branching database ❖ 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 formula's and sorting data within spreadsheets
Wider use of technology	❖ Recognising common uses of information technology including beyond school ❖ Recognising uses of technology beyond school	❖ Learning how computers are used in the wider world	❖ Understanding the purpose of emails	❖ Understanding that software can be used collaboratively online to work as a team	❖ Learning what a search engine is	❖ 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

Digital Literacy	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	❖ 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	❖ Understanding how to stay safe when talking to people online. Not sharing personal information and what to do if they see or hear something online that makes them feel upset or uncomfortable	❖ 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	❖ 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	❖ Identifying possible dangers online and learning how to stay safe ❖ Creating an animation about digital safety ❖ Recognising that information on the Internet might not be true or correct and learning ways of checking validity ❖ Learning to use an online community safely	❖ Understanding the importance of secure passwords and how to create them ❖ Using search engines safely and effectively ❖ Recognising that updated software can help to prevent data corruption and hacking.

Subject Connections across Subjects

Year Group	Unit	Unit content	Possible connections with other subjects?
EYFS	Computing systems and networks Using a computer	To be able to understand what a computer keyboard is and recognize 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	
EYFS	Programming: All About instructions	To know that being able to follow and give simple instructions is important in computing To understanding that it is important for instructions to be in the right order To understand why a set of instructions may have gone wrong	
1	Computing systems and networks Improving mouse skills	To know that "log in and log out" means to begin and end a connection with a computer To know that passwords are important for security 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.	
1	Programming: Algorithms unplugged	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'	
2	Creating media: Word Processing	To know that touch typing is the fastest way to type To know that 'copy and paste' is a quick way of duplicating text To know that I can make text a different style, size and colour	
2	Programming: Scratch Junior	To know that coding is writing in a special language so that the computer understands what to do To understand that the character in ScratchJr is controlled by the programming blocks To know that you can write a program to create a musical instrument or tell a joke	
3	Computing systems and networks: Journey inside a computer	To know the roles that inputs and outputs play on computers. To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together To know what a tablet is and how it is different from a laptop/desktop computer	
3	Programming: Scratch	To know that Scratch is a programming language and some of its basic functions To understand how decomposition is used in programming To understand how to use loops to improve programming To understand that you can remix and adapt existing code	

3	Creating media: Video trailers	To know that different types of camera shots can make my photos or videos look more effective. To understand that I can add transitions and text to my video To know that I can edit photos and videos using film editing software.	
4	Computing systems and networks: HTML *Skills Showcase unit which includes collaborative learning	To understand that copyright means that those images are protected and to understand that we should do a 'creative commons' image search if we wish to use images from the internet To know what "fake news" is and ways to spot websites that carry this type of misinformation To understand and identify examples of HTML tags To understand what changing the HTML and CSS does to alter the appearance of an object on the web To know what the 'inspect' elements tool is and ways of using it to explore and alter text and images	
4	Programming: Further coding with Scratch	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 quiz on Scratch	
4	Creating media: Website design	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	
5	Computing systems and networks: Search engines	To know how a search engine works 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	
5	Programming: Micro:bit	To understand and recognise coding structures including variables. To know what techniques to use to create a program for a specific purpose (including decomposition) To know that a Micro:bit is a programmable device To know that Micro:bit uses a block coding language similar to Scratch	
5	Creating media: Stop motion animation	To know that decomposition of an idea is important when creating stop-motion animations To understand that stop motion animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph To know that editing is an important feature of making and improving a stop motion animation	
6	Computing systems and networks: Bletchley Park	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 To understand what techniques are required to create a presentation using appropriate software.	
6	Programming: Introduction to Python	To know that there are text-based programming languages such as Logo and Python. To know that nested loops are loops inside of loops. To understand the use of random numbers and remix Python code	
6	Creating media: History of Computers	To know that radio plays are plays where the audience can only hear the action so sound effects are important To know that sound clips can be recorded using sound recording software To know that sound clips can be edited and trimmed	