

West Bridgford Junior School - Computing Curriculum Map



At West Bridgford Junior School, we believe that a high-quality Computing curriculum will equip our children with the computational thinking and creativity to understand, respond to and change the world. We follow the Kapow scheme for computing which fulfils the requirements of the National Curriculum 2014 through three strands: Computer Science (CS), Information Technology (IT) and Digital Literacy (DL). The Kapow scheme is designed as a spiral curriculum meaning the children build on prior knowledge and skills; revisit the key areas each year; and each year they cover the key areas with increasing complexity. We aim to ensure our children understand how digital systems work and how to put this knowledge to use through programming. Building on this knowledge and understanding, the children will use information technology to create their own content, express themselves and develop their ideas in real life contexts. This will equip them with the skills and knowledge needed for the future workplace and ensure they become active participants in an ever-changing digital world.

Key Stage 2 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.

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Year 3					
Autumn		Spring		Summer	
Online safety (DL)	Computing systems and networks 1 Networks and the internet (CS)	Programming: Scratch (CS)	Computer systems and networks 2: Emailing (IT)	Creating media: Video trailers (IT)	Data handling: Comparison cards databases. (IT)

Computer Science	Information Technology	Digital Literacy
<p>Understanding the role of the key components of a network</p> <p>Understanding that websites & videos are files that are shared from one computer to another.</p> <p>Learning about the role of packets.</p> <p>Understanding how networks work and their purpose.</p> <p>Identifying the key components within a network, including whether they are wired or wireless.</p> <p>Recognising links between networks and the internet</p> <p>Learning how data is transferred</p> <p>Using decomposition to explain the parts of a laptop computer.</p> <p>Using repetition in programs</p> <p>Using logical reasoning to explain how simple algorithms work.</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>Making reasonable suggestions for how to debug their own and others' code</p>	<p>Taking photographs and recording video to tell a story.</p> <p>Using software to edit and enhance their video adding music, sounds and text on screen with transitions</p> <p>Learning to log in and out of an email account</p> <p>Writing an email including a subject, 'to' and 'from'.</p> <p>Sending an email with an attachment.</p> <p>Replying to an email.</p> <p>Understanding the vocabulary associated with databases: field, record, data</p> <p>Learning about the pros and cons of digital versus paper databases.</p> <p>Sorting and filtering databases to easily retrieve information</p> <p>Creating and interpreting charts and graphs to understand data.</p> <p>Recognising how social media platforms are used to interact.</p> <p>Understanding the purpose of emails.</p>	<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>Learning about cyberbullying</p> <p>Learning that not all emails are genuine, recognising when an email might be fake and what to do about it</p>

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Year 4					
Autumn		Spring		Summer	
Online safety (DL)	Data handling: Investigating weather (IT)	Computing systems and networks: Collaborative learning (IT)	Creating media: Website design (IT)	Programming: Further coding with Scratch (CS)	Skills showcase: HTML (CS, DL, IT)

Computer Science	Information Technology	Digital Literacy
<p>Using tablets or digital cameras to film a weather forecast.</p> <p>Understanding that weather stations use sensors to gather and record data which predicts the weather</p> <p>Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.</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>	<p>Building a web page and creating content for it.</p> <p>Designing and creating a webpage for a given purpose.</p> <p>Use online software for documents, presentations, forms and spreadsheets.</p> <p>Using software to work collaboratively with others.</p> <p>Understanding why some results come before others when searching.</p> <p>Using keywords to effectively search for information on the internet</p> <p>Understanding that information found by searching the internet is not all grounded in fact.</p> <p>Searching the internet for data.</p> <p>Designing a device which 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> <p>Understanding that software can be used collaboratively online to work as a team</p>	<p>Learning to make judgements about the accuracy of online searches</p> <p>Identifying forms of advertising online</p> <p>Recognising what appropriate behaviour is when collaborating with others 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>

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Year 5

Autumn

Spring

Summer

Online safety (DL)

Programming 1:
Music (CS, IT)

Data handling:
Mars Rover 1 (CS)

Skills showcase:
Mars Rover 2 (CS, IT)

Creating media:
Stop motion animation
(CS, IT)

Programming 2:
Micro:bit (CS)

Computer Science

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 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 eight characters and carrying out binary calculations.
 Decomposing animations into a series of images
 Predicting how software will work based on previous experience
 Writing code to create a desired effect and amending it
 Writing more complex algorithms for a purpose
 Programming an animation
 Confidently using loops and repetition in their programming.

Information Technology

Using logical thinking to explore software more independently, making predictions based on their previous experience.
 Using a software programme (Sonic Pi/Scratch) to create music
 Using video editing software to animate
 Identify ways to improve and edit programs, videos, images etc.
 Independently learning how to use 3D design software package TinkerCAD.
 Understanding how data is collected in remote or dangerous places
 Understanding how data might be used to tell us about a location.
 Learn about different forms of communication that have developed with the use of technology

Digital Literacy

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 and learning ways of checking validity
 Learning what to do if they experience bullying online
 Learning to use an online community safely.



Year 6

Autumn

Spring

Summer

Online safety (DL)

Computer systems and networks:
Bletchley Park (CS, IT, DL)

Programming:
Intro to Python (CS)

Data handling:
Big Data 1 (IT)

Skills showcase:
Inventing a product (CS, IT, DL)

Computer Science

Information Technology

Digital Literacy

Learning about the history of computers and how they have evolved over time.
Understanding and identifying barcodes, QR codes and RFID.
Identifying devices and applications that can scan or read barcodes, QR codes and RFID
Decomposing a program into an algorithm.
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.
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

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 videos, adding multiple elements: music, voiceover, sound, text and transitions.
Using design software TinkerCAD to design a product.
Creating a website with embedded links and multiple pages
Understanding how search engines work.
Understanding how barcodes, QR codes and RFID work
Gathering and analysing data in real time.
Creating formulas and sorting data within spreadsheets
Learning how 'big data' can be used to solve a problem or improve efficiency.

Learning about the positive and negative impacts of sharing online.
Learning strategies to create a positive online reputation.
Understanding the importance of secure passwords and how to create them.
Learning strategies to capture evidence of online bullying in order to seek help.
Using search engines safely and effectively
Recognising that updated software can help to prevent data corruption and hacking