BRINDLE GREGSON LANE

Our World of Learning in computing

Love learning and inspire each other to thrive in the world.

Language and Literacy

First Hand Learning

My World and Me

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Early Years Foundation Stage				
Using a computer: learning about the main parts of computer and how to use the keyboard and mouse. Logging in and out.	**Exploring hardware**: Tinkering and exploring with different computer hardware and learning to operate a camera	**Programming Bee-Bots**: Children learn about directions, experiment with programming a Bee-Bot and tinker with hardware	**All about instructions**: children learn to receive and give instructions and understand the importance of precise instructions	**Introduction to data**: Children sort and categorise data and are introduced to branching databases and pictograms

National Curriculum KS1

Pupils should be taught to:

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions;
- create and debug simple programs;
- use logical reasoning to predict the behaviour of simple programs;
- use technology purposefully to create, organise, store, manipulate and retrieve digital content;
- recognise common uses of information technology beyond school;
- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

National Curriculum KS2

Pupils should be taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts;
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output;
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs;
- understand computer networks including the internet; how they can provide multiple services, such as the world wide web, and the opportunities they offer for communication and collaboration;
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content;
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information;
- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Intent

It is the intent of Brindle Gregson's Lane Primary School to prepare our pupils to play an active role in the digital world they live in. Through teaching our Computing curriculum, we hope to equip our children to participate safely in a rapidly changing world where both work and leisure activities are increasingly transformed by technology.

It is our intention to enable children to become digitally literate – able to use, express themselves and develop ideas effectively through information and communication technology.

We recognise that Computing skills are a significant factor in enabling children to be confident, creative and independent learners and it is our intention that children have every opportunity available to allow them to achieve this whilst having a clear understanding of internet safety and how to remain safe online.

Implementation

At BGL, computing is taught on a half-termly basis. This ensures children are able to develop depth in their knowledge and skills over the duration of each of their computing topics. Teachers use the Kapow Computing scheme, as a starting point for the planning of their computing lessons. Knowledge and skills are mapped across each topic and year group to ensure systematic progression. We have a range of devices including iPads, laptops and class computers to ensure that all year groups have the opportunity to use a range of devices and programs for many purposes across the wider curriculum, as well as in discrete computing lessons. Employing cross-curricular links motivates pupils and supports them to make connections and remember the steps they have been taught. The implementation of the curriculum also ensures a balanced coverage of computer science, information technology and digital literacy. The children will have experiences of all three strands in each year group with increasing level of difficulty and challenge as children move through school. Subject specific language and computing in the real world is embedded within the delivery of computing.

Impact

Through implementation of the computing curriculum at BGL, children will:

- understand and apply subject specific vocabulary
- achieve age related expectations at the end of each academic year
- retain and build on knowledge and understanding of computing
- have the opportunity to apply skills across the curriculum
- know the role of technology within our lives and how to use it responsibly.
- know how to stay safe online
- Children will develop proficiency in computing knowledge and skills to apply to their day-today life.

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		Y1	Y2	Y3	Y4	Y5	Y6
Computer Science	Hardware	• Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary. • Learning how to operate a camera • Recognising that a range of technology is used in places such as homes and schools • Learning what a keyboard is and how to locate relevant keys • Learning what a mouse is and • developing basic mouse skills such as moving and clicking	• Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary • Learning how to operate a camera • Recognising that a range of technology is used in places such as homes and schools • Learning what a keyboard is and how to locate relevant keys • Learning what a mouse is and • developing basic mouse skills such as moving and clicking	• 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)
	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 • 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 calculations • Understanding how bit patterns represent images as pixels	• Understanding that computer networks provide multiple services

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Computer Science	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 • Explaining the purpose of an algorithm • 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 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
	Programming	• Programming a Bee-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 corrected	• 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 a 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 website's code to create changes

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Information Technology	Using Software	• 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 software programme 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 3D design software package TinkerCAD	• 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, 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 images 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 relevantinformation on the internet • Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating searchreturns	• Understanding how search engines work
	Using Data	• 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
	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 thepurpose of emails.	• Understanding that software can be used collaboratively online to work as a team	• Understanding how to effectively use a search engine.	• 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

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Digital Literacy		• 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

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Computing Key Vocabulary	*Colour fade to indicate different units across the year*	account, clipart, computer, log on, log off, mouse, password, resize, screen (monitor), software, tool, username algorithm, Bee-Bot, computing code, computer program, explain, explore, instructions, predict, tinker, video algorithm, bug, debug, decompose, device, input, instructions, output, solution camera, collage, crop, delete, download, drag and drop, editing software, image, image filter, import, online, photo, resize, save as, search engine, sequence, storage space, visual effects branching database, categorise, chart, computer, data, information, label, pictogram, record, sort, table, text digital content, e-document, folder, list, save, sequence, share, spreadsheet	battery, buttons, computer, desktop, device, electricity, input, invention, keyboard, laptop, screen (monitor), mouse, output, technology, wires backspace, bold, copy, copyright, cut, delete, highlight, image, import, italics, keyboard, keyboard character, paste, redo, space bar, touch typing, underline, undo, word processing algorithm, animation, bug, computer code, code (verb), debug, icon, immitate, instructions, loop, repeat, Scratch JR, sequence abstraction, algorithm, artificial intelligence, bug, correct, data, debug, decompose, error, key features, loop, predict, unnecessary approximate, astronaut, data, digital content, experiment, interactive map, International space station (I.S.S), interpret, laboratory, monitor (verb), satellite, sensor, space, survival, thermometer animation, animator, contraption, decompose, design, device, download, film review, filming, import image, plan, sketch, software, stop motion, storyboard, upload	account, attachment (file), BCC, CC, computer, cyberbully, cyberbullying, domain, email, email account, emoji, information, log off, log on, password, spam, username animation, application, code, code block, debug, decompose, interface, loop, predict, program, remixing code, repetition code, review, Scratch, sprite, tinker algorithm, computer, computer program, CPU, (central processing unit) data, desktop, GPU (graphics processing unit), HDD (hard disk drive), QR code, RAM (random access memory), ROM (read only memory), tablet device, trackpad desktop, device, DSL (digital subscriber line), file, internet, laptop, network, network map, network switch, router, server, submarine cables, The Cloud, WiFi, wired, wireless, wireless access points application, desktop, digital device, edit, film, film editing software, graphics, import (software), key events, laptop, music, photo, plan, recording (electronic), sound effects, time code, video, voiceover categorise, data, database, fields (data), filter (data), graphs and charts, information, record, sort, spreadsheet	algorithm, atmosphere, automated machine, calculate, climate, design, device, forecast, input, log data, online, predict, record, sensor, source, spreadsheet, units of measurement, weather, weather satellite computer code, code block, conditional statement, decompose, direction, feature, icon, orientation, position, program (verb), Scratch project, Scratch, Scratch script, sprite, Scratch stage, tinker, variable collaboration, content, create, design, edit, embed, feature, header, hyperlinks, image, insert (file), online, plan, tab, web page, website, WWW (world wide web) code (verb), content, copyright, CSS (cascading style sheet), fake news, hacker, hex code, HTML (hypertext markup language), internet browser, permission, script, URL (uniform resource locator), web page collaborate, comment, e-document, edit, email, icon, insert (file), link, presentation, presentation software, reply, reviewing comments, share, spreadsheet, transition abstraction, algorithm design, computer code, code block, computational thinking, computer, decompose, pattern recognition, problem, Scratch, Scratch script, sequence, variable	catfishing, cyberbully, cybercriminal, cyberstalking, exclusion, fake profile, harassment, information, online, outing, online safety, password, personal information/data, phishing, trickery, trolling .hex file, .zip file, bluetooth, code block, decompose, emulator, feature, loop, Micro:bit, pedometer, predict, program, systematic, tinker, USB universal serial bus), variable basic commands, bug, computer code, code (verb), debug, error, live loop, loop, pitch, program language, rhythm, Sonic Pi, soundtrack, tempo, timbre, tinker algorithm, company logo, data leak, data privacy, fake news, inaccurate information, index, keywords (internet), network, online, page rank, search engine, web crawler, website, WWW (world wide web) binary code, data, data transmission, discovery, distance, input, Mars Rover, moon, numerical data, output, planet, radio signal, research, scientist, sequence, signal, computer simulation, space (astronomy) algorithm, binary image, bit, bit pattern, CAD (computer-aided design), compression file, CPU (central processing unit), data, digital image, encode, image, JPEG (joint photographic experts group), memory, operating system, pixels, RGB (red, green, blue)	algorithm, computer code, computer command, decompose, import (software), indentation (programming), loop, nested loop, random numbers, remix, script libraries, variable barcode, boolean, brand, commuter, contactless, data, data privacy, encrypt, infrared waves, NFC (near field communication), QR (quick response) code, radio waves, RFID (radio frequency identification), signal systems or data analyst, transmission big data, bluetooth, corrupt data, digital revolution, GPS (global positioning system), infrared waves, IoT (internet of things), QR code, RFID, SIM, smart city, smart school acrostic code, brute force hacking, caesar cipher, chip and pin system, cipher, date shift cipher, encrypt, invention, Nth letter cipher, password, pigpen cipher, secure, technological advancement, trial and error background noise, byte, computer, CPU, device, gigabyte, kilobyte, megabyte, memory storage, mouse, operating system (OS), radio play, ROM, sound effects, terabyte, touch screen, trackpad adapt, advertisement, algorithm, bug, CAD, computer code, code (verb), design, edit, electronic components, image rights, image, information, input, invention, loop, output, photo, product, program, repetition (code), screenshot, selection (programming), sequence, structure, variable