We speak the language of Computing

By the time they leave pupils will:
⌖ Be responsible, competent, confident and creative users of information and communication technology ⌖ Appreciate how to be respectful and responsible online; recognise acceptable/unacceptable behaviour and know ways to report concerns about content and contact ⌖ Appreciate how search engines work and evaluate digital content for suitability ⌖ Understand that computer networks provide multiple services and opportunities for communication and collaboration ⌖ Apply knowledge of information technology to new and unfamiliar technologies to solve problems ⌖ Understand and apply the fundamental principles and concepts of computer science (abstraction, logic, algorithms, data representation, sequence, selection and repetition in programs) when designing and writing programs ⌖ Use computational language when analysing a problem, breaking the problem down into smaller parts (decompose) to correct errors (debug) ⌖ Know how to select, use and combine a variety of software on a range of digital devices to collect, analyse, evaluate and present data and information
EYFS links
EYFS: Computing is embedded throughout the whole of the curriculum: This will look like: Instructional language, 1 and 2 step instructions, fixing instructions, giving directions Supporting children to stay safe on devices Use toy phones/cameras/computers within children's play Turning technological devices on and off Completing a simple programme on a device such as an iPad or a computer Draw information from computers to support children's learning

Curriculum End Points – Computing

The end points for each year group show how children apply the knowledge, skills and understanding they are taught before moving on with their learning.

Year 1

Online Safety	**Computing Systems: mouse skills**	**Programming 1: Algorithms unplugged**	**Programming 2: Bee-Bot**	**Creating Media: Digital imagery**	**Data Handling: Introduction to Data**	**Skills Showcase: Rocket to the Moon**
Children can…. • Search the internet safely and get help when needed • Know top tips for staying safe online • Understand the importance of a password	Children can…. • show good control of a mouse • show how we can use the internet • explain how we use information technology and give some examples	Children can…. • break down a problem in to smaller bits • explain what an algorithm is • follow a simple set of instructions	Children can…. • programme a BeeBot to follow a route • make corrections when things go wrong • explain my thinking behind my program	Children can…. • take photos and edit them to change them • download and search for images • operate a camera	Children can…. • represent data in tables, charts and pictograms • sort data • explain why digital data might be more useful than paper data	Children can…. • apply my skills with more independence • adapt and change my thinking when I run in to problems

Year 2

Online Safety	Computing Systems and Networks – What is a Computer?	Computing Systems and Network: Word Processing	Programming 1: Algorithms and debugging Programming 2: Scratch Jr	Creating Media: Stop Motion	Data Handling: International Space Station

Children can…. • Understand that personal information should not be shared on the internet. • be respectful to others when sharing content online	Children can…. • say what a computer is made up from • say what personal information should and should not be shared on the internet • say how computers and used in the wider world	Children can…. • show the basic skills of touch typing copy and paste text, and using shortcuts	Children can…. • explain that buttons cause effects • explain what decomposition is • explain what abstraction is • create a clear algorithm • use loops to make my code more efficient	Children can… • take photos with good control • use software to create animations • create and label images	Children can… • collect and input data • interpret my data

Year 3

Online Safety	Computing Systems and Network: **Networks and the Internet**	**Programming 1: Scratch**	Computing Systems and Network: **Emailing**	Computing Systems and Network: **Journey inside a Computer**	**Creating Media: Video Trailers**	Data Handling: **Comparison Cards databases**
Children can…. • recognise how social media platforms are used to interact • explain cyberbullying • Learning that not all information on the internet is factual • explain who personal information should/ should not be shared with	Children can…. • explain what a server does • explain what a network is • show how data is transferred	Children can…. • explain the purpose of an algorithm • use loops to make a code more efficient • debug a code, justifying what was wrong	Children can…. • log in and out of an email account • write an email including a subject, to and from • send an attachment	Children can…. • explain the different components of a computer • compare different types of computer	Children can…. • explore the code behind an animation • take photographs and record video to tell a story • edit and enhance my video to add music, sounds and text	Children can…. • use vocabulary relating to databases accurately • sort and filter databases • create and interpret charts and graphs

Year 4

Logical and resilient thinkers
Responsible, confident and creative users
Represent data
Analyse and solve problems
Digitally literate

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Online Safety	Computing Systems and Network: **Collaborative Learning**	Programming 1: **Further Coding with Scratch**	Creating Media: **Website Design**	Computing Systems and Network: **HTML**	Programming 1: **Computational Thinking**	Data Handling: **Investigating Weather**
Children can…. • Recognise what appropriate behaviour is when collaborating with others online • Recognise that information on the Internet might not be true or correct and that some sources are more trustworthy than others • Understanding why some results come before others when searching	Children can…. • work collaboratively with others • understand that we can use software to collaborate	Children can…. • code a simple game • use past experiences to solve new problems	Children can…. • design and create a webpage • learn about adverts on the internet	Children can…. • alter the code behind a website • build a webpage and create content for it	Children can…. • decompose a problem in to smaller parts • use abstraction and pattern to edit and modify code • remix an existing code	Children can…. • use their skills to design a weather station which gathers and records data

Year 5

Online Safety	Data Handling: Mars Rover 1	Skills Showcase: Mars Rover 2	Computing Systems and Network: Search Engines	Programming 1: Music	Programming 2: Micro:bit	Creating Media: Stop Motion Animation
Children can…. • state about how permissions work and how to change them • Considering the effects of screen-time on physical and mental wellbeing • Know about online bullying and where to seek advice	Children can…. • explain the difference between ROM and RAM • explain what binary is and can understand simple binary • explain who message can be sent using binary	Children can…. • apply my skills to a project • show how bit patterns represent images as pixels	Children can…. • refine my search to find relevant information on the internet • understand how my search results might be affected	Children can…. • use a nested loop • write code to achieve a desired affect • use Scratch to create music	Children can…. • understand the fetch, decode, execute cycle • show how external devices can be programmed by a computer	Children can…. • decompose animations in to a series of images • decompose to plan a story • programme an animation

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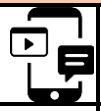
Year 6

Online Safety 	Skills Showcase: Bletchley Park 	Creating Media: History of Computers 	Data Handling: Big Data 1 	Programming: Intro to Python 	Data Handling: Big Data 2 	Skills Showcase: Inventing a Product 
Children can…. • Understand the importance of secure passwords and how to create them, along with two-step authentication • Use search engines safely and effectively • Consider their digital footprint and online reputation • Learn about how to collect evidence and report online bullying concerns	Children can…. • explain what code is and what is its purpose • state why are strong passwords important • explain the significance of Bletchley Park • identify the contribution of historical figures to advances in computing	Children can…. • explain what an operating system is • add and edit sound effects to achieve an effect • show how computers have changed over time • explain your choices of your own computer design of the future	Children can…. • explain that infrared waves can transmit data • identify a variety of ways to collect and send data • explain why it is important to analyse data • identify how you keep your data private and what is this right called	Children can…. • explain happens if I run specified code • show common coding language • break down your instructions in to smaller chunks • create and correct loops	Children can…. • name some types of data that can be transferred wirelessly • explain what Big Data is • explain how smart devices work together • decide and consider - should businesses collect data to improve their products?	Children can…. • suggest how programs can be improved • explain how products can be designed and what features are needed • explain how websites are created • identify techniques used to advertise products

Progression in Computing through the Year Groups

Code – Connect – Communicate – Collect






	Year 1 Inc Skills Showcase	Year 2	Year 3	Year 4 Inc Skills Showcase	Year 5 Inc Skills Showcase	Year 6 Inc Skills Showcase
	Online Safety – Knowledge					
	• 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	• Understanding that personal information should not be shared on the internet. • Learning how to be respectful to others when sharing content online	• Recognising how social media platforms are used to interact • 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	• 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 • Understanding why some results come before others when searching • Understanding that information on the internet is not all grounded in fact	• 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

	how we 'share' information on the internet		who personal information should/ should not be shared with			bullying concerns
	Hardware - Knowledge					
	• 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 of touch typing	• 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 - Knowledge					
	• 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 calculations • Understanding how bit patterns represent images as pixels	• Understanding that computer networks provide multiple services
	Computational thinking - 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	• 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	• 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

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	Programming - Skills					
	• Programming a Bee-bot/Virtual Bee-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 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
	Using Software - Skills					
	• Using a basic range of tools within graphic editing software • Taking and editing photographs • Understanding how	• Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts	• Taking photographs and recording video to tell a story. • Using software to edit and enhance their video adding music, sounds	• Building a web page and creating content for it • Designing and creating a webpage for a given purpose	• Using logical thinking to explore software more independently, making predictions based on their previous experience • Using a software	• Using logical thinking to explore software independently, iterating ideas and testing continuously • Using search and

	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	• Using word processing software to type and reformat text • Using software to create story animations • Creating and labelling images	and text on screen with transitions	• Use Google online software for documents, presentations, forms and spreadsheets. • Work collaboratively with others	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	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 - Knowledge					
	• 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	• 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

			search engines			
	Using Data - 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
	Wider use of technology - Knowledge					
	• Recognising common uses of information technology, including beyond school •Understanding 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
	Digital literacy - Knowledge					
	• Logging in and out and saving work on	Understanding that personal information	• Learning to be a responsible digital	• Recognising what appropriate behaviour is	• Learning about how permissions work and	• Understanding the importance of secure

	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	should not be shared on the internet. • Learning how to be respectful to others when sharing content online.	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	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.	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	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
Big Ideas/Key Questions	Can I show good control of a mouse? Can I show how we can use the internet? Can I explain how we use information technology and give some examples? Can I break down a problem in to smaller bits? Can I explain what an algorithm is? Can I follow a simple set of	Can I say what a computer is made up from? Can I say what personal information should and should not be shared on the internet? I can say how computers and used in the wider world? Can I show the basic skills of touch typing? Can I copy and paste text,	Can I explain what a server does? Can I explain what a network is? Can I show how data is transferred? Can I explain the purpose of an algorithm? Can I use loops to make a code more efficient? Can I debug a code, justifying what was wrong?	Can I work collaboratively with others? Can I understand that we can use software to collaborate? Can I code a simple game? Can I use past experiences to solve new problems? Can I design and create a webpage? Can I learn about adverts on	Can I explain the difference between ROM and RAM? Can I explain what binary is and can understand simple binary? Can I explain who message can be sent using binary? Can I apply my skills to a project? Can I show how bit patterns represent images as pixels? Can I refine my search to find relevant information on the	What code is and what is its purpose? Why are strong passwords important? What is the significance of Bletchley Park? Can you identify the contribution of historical figures to advances in computing? Can you explain what an operating system is?

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	instructions? Can I programme a BeeBot to follow a route? Can I make corrections when things go wrong? Can I explain my thinking behind my program? Can I take photos and edit them to change them? Can I download and search for images? Can I operate a camera? Can I represent data in tables, charts and pictograms? Can I sort data? Can I explain why digital data might be more useful than paper data? Can I apply my skills with more independence? Can I adapt and change my thinking when I run in to problems?	and using shortcuts? Can I explain that buttons cause effects? Can I explain what decomposition is? Can I explain what abstraction is? Can I create a clear algorithm? Can I use loops to make my code more efficient? Can I take photos with good control? Can I use software to create animations? Can I create and label images? Can I collect and input data? Can I interpret my data?	 Can I log in and out of an email account? Can I write an email including a subject, to and from? Can I send an attachment? Can I explain the different components of a computer? Can I compare different types of computer? Can I explore the code behind an animation? Can I take photographs and record video to tell a story? Can I edit and enhance my video to add music, sounds and text? Can I use correct vocabulary? Can I sort and filter databases? Can I create and interpret charts and graphs?	the internet? Can I alter the code behind a website? Can I build a webpage and create content for it? Can I decompose a problem in to smaller parts? Can I use abstraction and pattern to edit and modify code? Can I remix existing code? Can I use my skills to design a weather station which gathers and records data?	internet? Can I understand how my search results might be affected? Can I use a nested loop? Can I write code to achieve a desired affect? Can I use Scratch to create music? Can I understand the fetch, decode, execute cycle? Can I show how external devices can be programmed by a computer? Can I decompose animations in to a series of images? Can I decompose to plan a story? Can I programme an animation?	Can you add and edit sound effects to achieve an effect? Can you show how computers have changed over time? Can you explain your choices of your own computer design of the future? Can you explain that infrared waves can transmit data? Do you know a variety of ways to collect and send data? Why it is important to analyse data? How can you keep your data private and what is this right called? What happens if I run specified code? Can you show common coding language? Can you break down your instructions in to smaller chunks? Can you create and correct loops? Name some types of data that can be transferred wirelessly? What is Big Data? How do smart devices work together? Should businesses collect data to improve their products?

						How can programs be improved? How can products be designed and what features are needed? How are websites created? What techniques are used to advertise products?