Computing curriculum overview

Kapow Primary offers full coverage of the KS1 and KS2 Computing curriculum, including EYFS.
We have categorised our content into three areas:

DL **Digital Literacy and Online Safety**

CT **Computational Thinking**

CH **Computers and Hardware**

Early Years Foundation Stage - Early years outcomes: Technology You may observe that a child:	Kapow Primary's computing themes	Kapow Primary's topics
Completes a simple program on a computer	**DL**	Computing through continuous provision Using a computer
Interacts with age-appropriate computer software	**CT** **DL**	Computing through continuous provision Exploring hardware All about instructions Programming: Bee Bots Using a computer
ELG: Children recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes	**CT** **CH**	Supporting a child-led project using technology Exploring hardware Programming: Bee Bots Sorting and categorising: Introduction to data Using a computer

Key stage 1 - National Curriculum computing subject content Pupils should be taught to:	Kapow Primary's computing themes	Kapow Primary's topics
Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions	CT	Y1 > Programming: Bee-Bots, Algorithms unplugged Y2 > What is a computer?, Programming: ScratchJr, Algorithms and debugging, International Space Station
Create and debug simple programs	CT	Y1 > Programming: Bee-Bots, Algorithms unplugged Y2 > Programming: ScratchJr, Algorithms and debugging
Use logical reasoning to predict the behaviour of simple programs	CT	Y1 > Programming: Bee-Bots, Digital imagery Y2 > Programming: ScratchJr, Algorithms and debugging
Use technology purposefully to create, organise, store, manipulate and retrieve digital content	DL	Y1 > Getting started, Digital imagery, Introduction to data, Rocket to the moon Y2 > Word processing, Programming: ScratchJr, International Space Station, Stop motion
Recognise common uses of information technology beyond school	CH	Y1 > Getting started, Digital imagery, Introduction to data Y2 > What is a computer?, Stop motion
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	DL	Y1 > Getting started, Digital imagery Y2 > Word processing

Key stage 2 - National Curriculum computing subject content	Kapow Primary's computing themes	Kapow Primary's topics
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	**CT**	Y3 > Journey inside a computer, Programming: Scratch Y4 > HTML, Computational thinking, Further coding with Scratch Y5 > Micro:bit, Sonic Pi Y6 > Intro to Python, Skills showcase
Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	**CT**	Y3 > Programming: Scratch Y4 > HTML, Investigating weather, Computational thinking, Further coding with Scratch Y5 > Micro:bit, Sonic Pi Y6 > Intro to Python, Skills showcase
Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	**CT**	Y3 > Journey inside a computer, Programming: Scratch Y4 > HTML, Computational thinking, Further coding with Scratch Y5 > Micro:bit, Sonic Pi Y6 > Intro to Python, Skills showcase
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	**CH** **DL**	Y3 > Journey inside a computer, Emailing, Networks (archived), Networks and the internet (new) Y4 > Collaborative learning, The internet Y5 > Micro:bit, Search engines, Mars Rover 1 Y6 > Bletchley Park 1, Skills showcase, Big Data 1
Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	**CH** **DL**	Y3 > Digital literacy, Networks and the internet (new) Y4 > The internet (archived) Y5 > Search engines Y6 > Bletchley Park 1, Skills showcase

Key stage 2 - National Curriculum computing subject content Pupils should be taught to:	Kapow Primary's computing themes	Kapow Primary's topics
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	**CH** **CT**	Y3 > Emailing, Top trumps databases, Digital literacy Y4 > Collaborative learning, Website design, Investigating weather Y5 > Online Safety, Micro:bit, Sonic Pi, Mars Rover 1 Y6 > Bletchley Park 1, Skills showcase, Big Data 1
Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	**DL**	Y3 > Emailing Y4 > Website design, HTML, Investigating weather Y5 > Online Safety, Search engines Y6 > Bletchley Park 1, Skills showcase, Big Data 1

EYFS	Description	Curriculum coverage	Links to other areas of learning
Teacher guidance: Computing through continuous provision Go to guidance	Resourcing your continuous and enhanced provision, and observing computing skills through play.	**CH** **CT** Guidance for teachers on how to audit the classroom environment to ensure opportunities for the exploration of computers, hardware and computational thinking are being provided. Guidance on undertaking observations of the children at play to ensure computing outcomes are met and developed.	
Teacher guidance: Supporting a child-led project using technology Go to guidance	Using technology to support pupils' learning in other areas and introducing digital safety.	**DL** Modelling how to search for images safely online. When using the internet alongside an adult, or independently, learning what to do if they come across something that worries them or makes them feel uncomfortable. **CH** Using a camera and/or iPad to take photos. Recognising that a range of technology is used in places such as homes and school.	Communication and language - speaking Physical development - moving and handling CoEL - Playing and exploring
Exploring hardware (5 lessons) Go to unit	Exploring hardware through the use of tinker trays for play and introducing cameras and other technology to record meaningful moments.	**CH** Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary. Learning how to operate a camera and/or iPad and use them to take photos Recognising that a range of technology is used in places such as homes and schools.	Communication and language - understanding & speaking Mathematics -numbers & shape, space and measures CoEL - Active learning CoEL - Creating and thinking critically
All about instructions (5 lessons) Go to unit	Learning how to follow and give instructions in 'unplugged' practical games and activities, and learning what to do when things go wrong.	**CT** Following instructions as part of practical activities and games and learning to debug when things go wrong. Learning to give simple instructions. Learning that an algorithm is a set of instructions to carry out a task, in a specific order. Using logical reasoning to read simple instructions and predict the outcome	
Programming: Bee Bots (5 lessons) Go to unit	Exploring how Bee Bots work and how to give them simple instructions, using them in child-led play. Acquiring the help of an adult to learn to debug and problem solve when things go wrong.	**CH** Experimenting with programming a Bee-bot/Blue-bot and learning how to give simple commands. **CT** Learning to debug instructions, with the help of an adult, when things go wrong.	PSED - self-confidence and self-awareness Mathematics - shape, space and measures CoEL - Playing and exploring CoEL - Creating and thinking critically

EYFS	Description	Curriculum coverage	Links to other areas of learning
Introduction to data: Sorting and categorising (5 lessons) Go to unit	Understanding how to sort and categorise objects and give reasons why, including a play-based exploration of branch databases. Learning to represent data in practical ways and through pictograms.	**DL** **CT** Representing data through sorting and categorising objects in unplugged scenarios. Representing data through pictograms. Exploring branch databases through physical games.	Mathematics -numbers & shape, space and measures CoEL - Active learning CoEL - Creating and thinking critically
Using a Computer (5 lessons) Go to unit	Learning the basic skills needed to use a computer, including keyboard and mouse exploration, and using these skills for a purpose.	**DL** Learning to log in and log out. Using a simple online paint tool to create digital art. **CH** 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.	Physical development - moving and handling CoEL - Playing and exploring CoEL - Active learning

Year 1	Getting started (5 lessons)	Programming: Bee-Bots	Algorithms unplugged (5 lessons)	Digital imagery (5 lessons)	Introduction to data (5 lessons)	Rocket to the moon (5 lessons)
	Introducing children to logging in and using technology for a purpose, including creating art **Go to topic**	(5 lessons) Using Bee-Bots to navigate an area and constructing simple algorithms, through the story of The Three Little Pigs **Go to topic**	Learning how computers handle information by exploring 'unplugged' algorithms- completing tasks away from the computer **Go to topic**	Taking and manipulating digital photographs, including adding images found via a search engine **Go to topic**	Learning about what data is and how it can be represented and using these skills to show the findings of a mini beast hunt **Go to topic**	Appreciating the value of computers, understanding that they helped us get to the moon **Go to topic**
	DL Recognising common uses of information technology. Logging in and saving work on their own account. Knowing what to do if they have concerns about content or contact online. Understanding of how to create digital art using an online paint tool. **CH** Learning to locate where keys are on the keyboard. Developing basic mouse skills.	**CT** Learning how to explore and tinker with hardware to find out how it works. Constructing a series of instructions into a simple algorithm. Applying computing concepts to real world situation in an unplugged activity.	**CT** Understanding how to create algorithms. Learning that computers need information to be presented in a simple and clear way. Understanding how to break a computational thinking problem into smaller parts in order to solve it.	**DL** Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Knowing what to do if they have concerns about content or contact online. **CT** Using logical reasoning to predict the behaviour of simple programs. **CH** Using cameras or tablets to take photos.	**DL** Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Selecting software appropriately. **CH** Recognising uses of technology beyond school.	**DL** Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Selecting software appropriately.
Cross curricular links	Art & Design Maths			English: Reading	Maths Science	Science D&T Maths History

Year 2	What is a computer? (5 lessons)	Word processing (5 lessons)	Programming: ScratchJr (5 lessons)	Algorithms and debugging (5 lessons)	International Space Station (5 lessons)	Stop motion (5 lessons)
	Children explore exactly what a computer is, identifying and learning how inputs and outputs work, how computers are used in the wider world and designing their own computerised invention **Go to topic**	Using their developing word processing skills, pupils write simple messages to friends and learn why we must be careful about who we talk to online **Go to topic**	Using the app 'ScratchJr', pupils programme a familiar story and an animation of an animal, make their own musical instruments and follow an algorithm to record a joke **Go to topic**	Identifying problems with code using both 'unplugged' and 'plugged' systems to diagnose and correct errors in an algorithm- a process known as 'debugging' **Go to topic**	Building on their understanding of how computers sense the world around us, pupils learn how data is collected, used and displayed to keep astronauts safe on-board the I.S.S **Go to topic**	Pupils create simple animations, storyboarding their ideas then decomposing it into small parts of action to be captured using Stop Motion Animation Software **Go to topic**
	CT Learning about inputs and outputs and how they are used in algorithms. **CH** Understanding what a computer is and the role of individual components.	**DL** Using word processing software to type and reformat text. Understanding the importance of staying safe online.	**CT** Creating and debugging simple programs. Using logical reasoning to predict the behaviour of simple programs. Understanding what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. **DL** Using technology purposefully to create, organise, store, manipulate and retrieve digital content.	**CT** Creating and debugging simple programs. Using logical reasoning to predict the behaviour of simple programs. Understanding what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.	**DL** Using technology to create and label images and to put data into a spreadsheet. **CT** Consider inputs and outputs to understand how sensors work.	**DL** Using technology purposefully to create, organise, store, manipulate and retrieve digital content. **CH** Understanding how to use tablets or computers to take photos.
Cross curricular links	D&T Science	PSHE			Science	English

Year 3	Emailing (5 lessons)	Journey inside a computer (5 lessons)	Top trumps databases (5 lessons)	Digital literacy (5 lessons)	Programming: Scratch (5 lessons)	Networks and the internet (5 lessons)
	Pupils learn how to send emails, including attachments and how to be responsible digital citizens Go to topic	Children learn about the different parts of a computer through role-play and develop their understanding of how they follow instructions Go to topic	Developing their understanding of data and databases, children play with and create their own Top Trumps cards, learning how to interpret information by ordering and filtering Go to topic	Developing their video skills, pupils create a book trailer, storyboarding their trailers before then filming and editing their videos, adding effects such as transitions, music, voice and text Go to topic	Using Scratch, with its block-based approach to coding, pupils learn to tell stories and create simple games Go to topic	To understand how computers communicate, children learn about networks and the internet, and how they are used to share information. Go to topic
	DL Learn about cyberbullying and fake emails. Understanding the purpose of emails.	**CH** Understanding what different components of a computer do. **CT** Understanding that programs execute by following precise and unambiguous instructions.	**DL** Using technology purposefully to create, organise, store, manipulate and retrieve data.	**DL** Using technology purposefully to create, organise, store, manipulate and retrieve digital content, including searching for relevant information.	**CT** Using logical reasoning to explain how simple algorithms work. Designing, writing and debugging programs that accomplish specific goals, including controlling or simulating physical systems. Solving problems by decomposing them into smaller parts. Using sequence, selection, and repetition in programs. Working with variables and various forms of input and output.	**CH** Identifying network components and understand how they are used to connect to the internet and how data is transferred. **DL** Understanding 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.
Cross curricular links	English		Maths	English		

Year 4	Collaborative learning (5 lessons)	Further coding with Scratch (5 lessons)	Website design (5 lessons)	HTML (5 lessons)	Investigating weather (5 lessons)	Computational thinking (5 lessons)
	Learning to work collaboratively in a responsible way using tools including Google Docs and Sheets **Go to topic**	The coding program Scratch is explored further by revisiting key features and introducing the children to the crucial concept and execution of using 'variables' in code scripts. **Go to topic**	Pupils design and create their own websites, considering content and style, as well as understanding the importance of working collaboratively **Go to topic**	Pupils explore the language behind well-known websites, while developing their understanding of how to change the core characteristics of a website using HTML and CSS **Go to topic**	Children investigate the role of computers in forecasting and recording weather as well as how technology is used to present forecasts **Go to topic**	Through developing their understanding of the four pillars of computational thinking, children learn to identify them in different contexts **Go to topic**
	DL Selecting using and combining a variety of software to design and create a range of programs, systems and content that accomplish given goals. Understanding opportunities offered by the World Wide Web for communication and collaboration.	**CT** Using logical reasoning to explain how simple algorithms work. Designing, writing and debugging programs that accomplish specific goals, including controlling or simulating physical systems. Solving problems by decomposing them into smaller parts. Using sequence, selection and repetition in programs. Working with variables and various forms of input and output.	**DL** Selecting using and combining a variety of software to design and create a range of programs, systems and content that accomplish given goals. Understanding opportunities offered by the World Wide Web for communication and collaboration.	**DL** Recognising that information on the Internet might not be true or correct. Using technology safely, by recognising acceptable/unacceptable behaviour. Knowing what to do when they have concerns about content or contact online. **CT** Understanding that websites can be altered by exploring the code beneath the site. Designing, writing and debugging programs that accomplish specific goals. Solving problems by decomposing them into smaller parts.	**DL** Understanding why some sources are more trustworthy than others. **CT** Understanding the role of inputs and outputs in computerised devices.	**CT** Understand what decomposition is and how it facilitates problem solving. Designing, writing and debugging programs that accomplish specific goals. Understand abstraction and patterns recognition.
Cross curricular links					Science Geography	

Year 5	Online safety (5 lessons)	Micro:bit (5 lessons)	Search engines (5 lessons)	Sonic Pi (5 lessons)	Mars Rover 1 (5 lessons)	Mars Rover 2 (5 lessons)
	Pupils create an online safety resource for younger children using tools such as presentation software, video tools or a simple stop-motion animation **Go to topic**	Programming a small device called a micro:bit to display animations or messages on its simple LED display using block coding **Go to topic**	To enable children to quickly and accurately find information and become independent learners, they need to develop their searching skills and learn how to identify trustworthy sources **Go to topic**	Composing music using code through Sonic Pi, pupils can import samples, add drum beats and compose simple tunes culminating in a 'battle of the bands' using live loops of music **Go to topic**	Pupils explore inputs and outputs as well as Binary numbers to understand how the Mars Rover transmits and receives data and how scientists are able to control it to explore another planet! **Go to topic**	Children learn how the Mars Rover is able to send images all the way back to Earth and experiment with online CAD software to design new tyres for it **Go to topic**
	DL Recognising that information on the Internet might not be true or correct. Using technology safely, by recognising acceptable/ unacceptable behaviour and knowing what to do when they have concerns about content or contact online.	**CT** Using block coding to program a device. To explore variables and different forms of input. **CH** Understand how external devices can be programmed by a separate computer.	**DL** Recognising that information on the Internet might not be true or correct. Know how to use key words to quickly find accurate information.	**DL** Selecting using and combining a variety of software to design and create a range of programs, systems and content that accomplish given goals. **CT** Using programming language to create music, including use of loops.	**DL** Understanding 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. **CH** Using search technologies effectively, appreciating how results are selected and ranked, and be discerning in evaluating digital content. Recognising that computers transfer data in binary and understand simple binary addition.	**DL** Developing their CAD skills. **CH** Understanding how image data is transferred.
Cross curricular links				English: Reading Music		

Year 6	Bletchley Park 1 & 2 (10 lessons)		Intro to Python (5 lessons)	Big Data 1 (5 lessons)	Big Data 2 (5 lessons)	Skills Showcase (5 lessons)
	Children learn about the history of Bletchley Park, including: key historical figures, how the first modern computers were created at as part of a WWII code breaking team and consider how computers have evolved over time. They then go on to investigate secret codes and how they are created, exploring 'brute force' hacking and learn how to make passwords more secure **Go to topic**		Building on their knowledge of coding from previous years, children are introduced to the text-based programming language Python, which is the language behind many apps and programs, such as Dropbox **Go to topic**	Children learn how data is collected and stored by exploring barcodes, QR codes and RFID chips, and investigate how collecting big data can be used to help people in a variety of different scenarios **Go to topic**	Children learn the difference between mobile data and WiFi and how data is transferred and use their understanding of big data to design their own smart school **Go to topic**	Reflecting on and showcasing their computing skills, pupils create an entire project around a specific theme **Go to topic**

	DL	**DL**	**CT**	**DL**	**DL**	**DL**
	Understanding the importance of secure passwords and using searching and word processing skills to create a presentation. **CT** Using programming software to understand hacking, relating this to computer cracking codes in WWII.	Editing sound recordings for specific purpose. **CH** Learning about the history of computers and how they evolved over time.	Understanding that websites can be altered by exploring the code beneath the site. Designing, writing and debugging programs that accomplish specific goals Solving problems by decomposing them into smaller parts.	Understanding how learning can be applied to a real world context. Selecting, using and combining a variety of software to design and create a range of programs, systems and content to collect, analyse, evaluate and present data. **CH** Understanding that computer networks provide multiple services Understanding how barcodes and QR codes work.	Selecting, using and combining a variety of software to design and create a range of programs, systems and content to collect, analyse, evaluate and present data.	Showcasing their digital literacy skills. **CT** Demonstrating their computational thinking skills by designing and debugging programs, using different inputs and outputs. **CH** Understanding how search engines work and knowing how to use them safely and effectively.

Cross curricular links	History Maths	English	Art & Design Maths	Science		