Computing

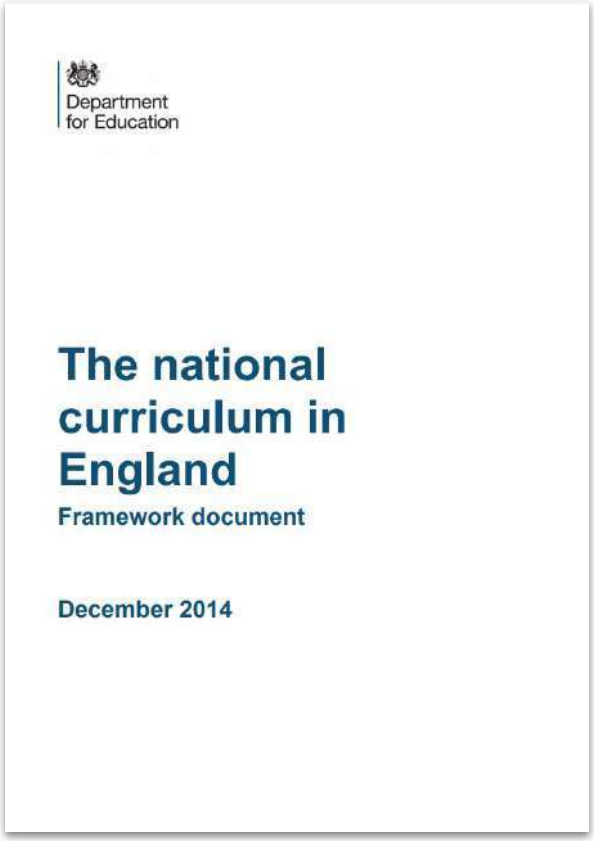
Long-term plan

Standard

Our full 36-week EYFS, KS1 and KS2 long-term plan for **Computing** is designed for schools that deliver the subject each week.

How does Kapow Primary help our school to meet the statutory guidance for computing?

Our scheme of work fulfils the statutory requirements for computing outlined in the **National curriculum (2014)** and, when used in conjunction with our RSE & PSHE scheme, also covers the government's **Education for a Connected World -2020 edition** framework (see our [Education for a Connected World framework mapping).]



How does Kapow Primary's scheme of work align with the National curriculum?

Our scheme of work fulfils the statutory requirements outlined in the **National curriculum (2014)**. The National Curriculum Programme of Study for Computing aims to ensure that all pupils:

We have identified these three strands which run throughout our scheme of work:

- ★ 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.

Computer Science

- ★ Can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems.

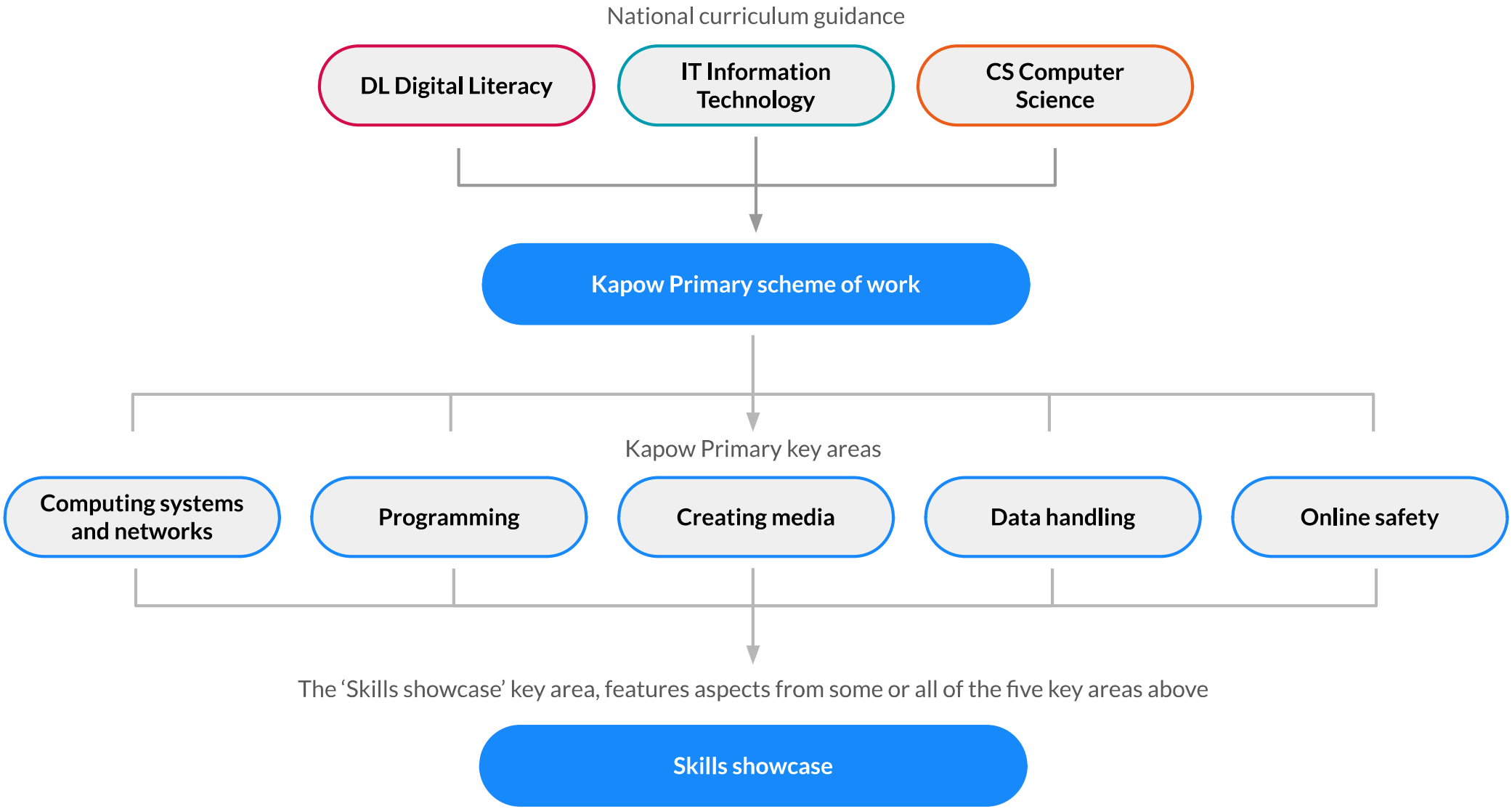
Information Technology

- ★ Are responsible, competent, confident and creative users of information and communication technology.

Digital Literacy

Our National curriculum mapping document shows which of our units cover each of the National curriculum attainment targets as well as each of the three strands. Each lesson plan references the relevant National curriculum objectives, along with cross-curricular links to any other subjects.

How is the Computing scheme of work organised?



Key areas

We have categorised our lessons into the five key areas below, which we return to in each year group making it clear to see prior and future learning for your pupils and how what you are teaching fits into their wider learning journey.

Computing systems and networks	Programming	Creating media	Data handling	Online safety
Identifying hardware and using software, while exploring how computers communicate and connect to one another.	Understanding that a computer operates on algorithms, and learning how to write, adapt and debug code to instruct a computer to perform set tasks.	Learning how to use various devices — record, capture and edit content such as videos, music, pictures and photographs.	Ensuring that information is collected, recorded, stored, presented and analysed in a manner that is useful and can help to solve problems.	Understanding the benefits and risks of being online — how to remain safe, keep personal information secure and recognising when to seek help in difficult situations.

Skills showcase units

There are four units entitled Skills showcase. These units give children the chance to combine and apply skills and knowledge gained, from a range of the five key areas above, to produce a specific outcome.

Y1 - Rocket to the moon	Y4 - HTML	Y5 - Mars Rover 2	Y6 - Inventing a product
	Heading Heading 2 Heading 3 Heading 4 Heading 5 Heading 6		

Oracy in Computing

'Oracy is the ability to speak eloquently, to articulate ideas and thoughts, to influence through talking, to collaborate with peers and to express views confidently and appropriately.

Oracy refers both to the development of speaking and listening skills, and the effective use of spoken language in teaching and learning. It is to speech what literacy is to reading and writing, and numeracy is to Maths.'

Speak for Change: Final report and recommendations from the Oracy All-Party Parliamentary Group Inquiry.

Learning *through* talk

At Kapow Primary, we believe it's crucial to provide pupils with opportunities for exploratory talk during their learning. This involves thinking aloud, questioning, discussing, and collaboratively building ideas.

Learning *to* talk

Similarly, developing oracy skills is essential for pupils to express and articulate themselves effectively across various contexts and settings, including formal ones like public speaking, debates, and interviews.

Through our Computing curriculum, pupils have opportunities to develop their oracy skills by:

- Communicating and solving problems collaboratively in groups or pairs.
- Building on the ideas of others and using discussions to plan programming projects.
- Articulating their thoughts, processes and reasoning (e.g. when debugging).
- Explaining and justifying their decisions during problem-solving tasks.
- Presenting their final outcomes to an audience, enhancing their public speaking skills.
- Evaluating the final outcomes of peers' work.

A spiral curriculum

Kapow Primary's Computing scheme of work has been designed as a spiral curriculum with the following key principles in mind:

✓ **Cyclical**: Pupils revisit the five key areas throughout KS1 and KS2.

✓ **Increasing depth**: Each time a key area is revisited, it is covered with greater complexity.

✓ **Prior knowledge**: Upon returning to each key area, prior knowledge is utilised so pupils can build on previous foundations, rather than starting again.

Is there any flexibility in the Kapow Primary Computing scheme?

Our Computing scheme of work is organised into units. Within each unit, lessons must be taught in order as they build upon one another.

Across a single year group, units themselves do not need to be taught in the suggested order, with the exception of the numbered units which should be taught in the correct order (e.g. **Programming 1** before **Programming 2**). We would also suggest that the **Autumn 1** unit is taught first each year where possible.

The flexibility in the order the units can be taught, allows schools to adapt the planning to suit their school and to make use of cross-curricular links available.

Assessment in Computing

Formative assessment

Every lesson begins with the 'Recap and recall' section which is intended to allow pupils retrieval practice of key knowledge relevant to the upcoming lesson. This section also provides teachers with an opportunity to make informal judgements about whether pupils have retained prior learning and are ready to move on.

Each lesson contains the 'Assessing progress and understanding' section which helps teachers to identify those pupils who are secure in their learning or working at a greater depth in each lesson. These assessments can then be recorded on our Computing: Assessment spreadsheet which supports the teacher in identifying gaps in learning amongst the class or for individual pupils.

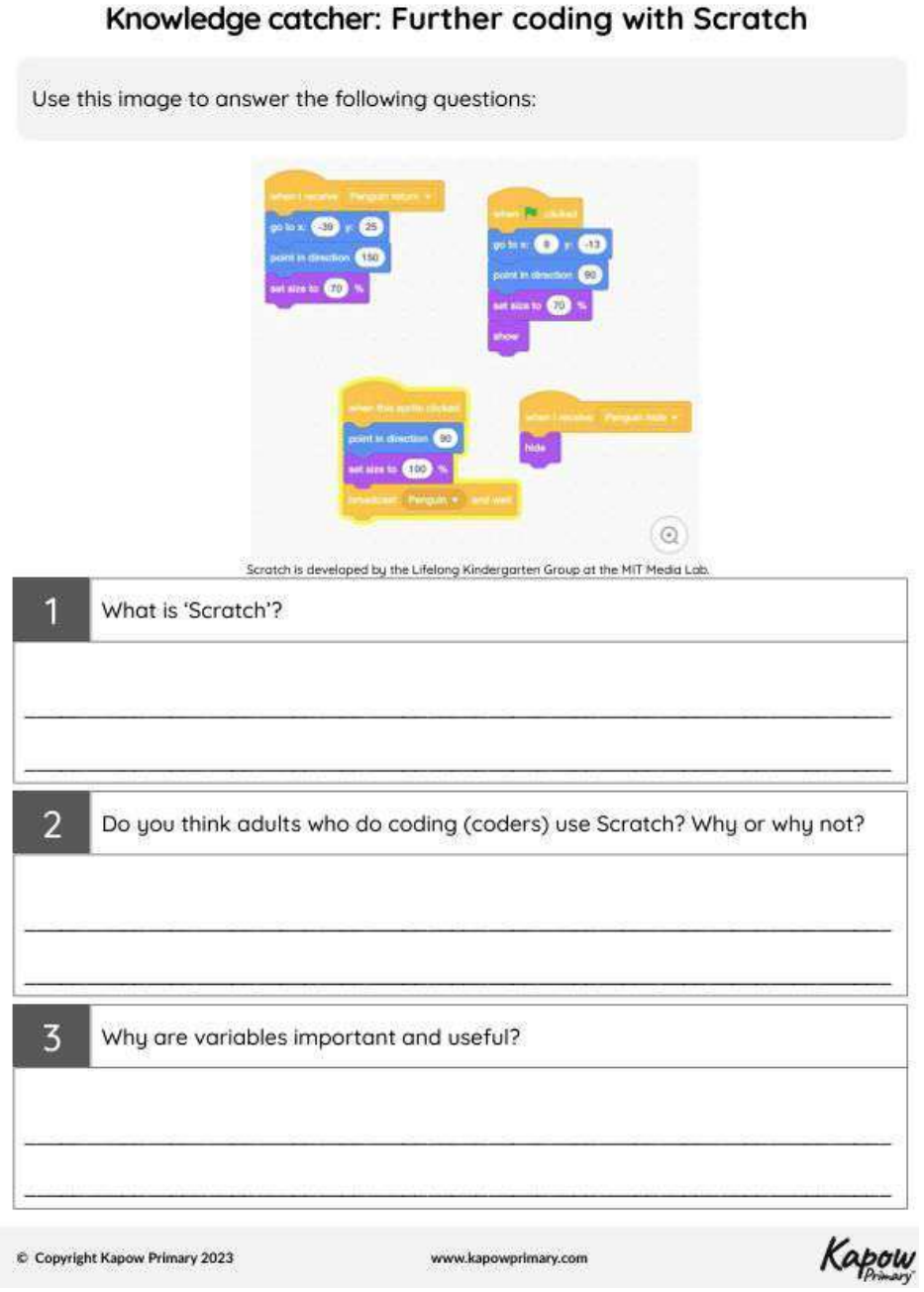
Summative assessment

Each unit of work assesses children's understanding and retention of key knowledge using an assessment quiz with multiple choice and open-ended questions.

In addition, each unit uses a knowledge catcher. This can be used at the beginning and/or end of a unit and gives children the opportunity to further demonstrate their understanding of the key concepts covered.

Assessment quizzes, and knowledge catchers provide teachers with a record of summative assessment as evidence of progression throughout the year and as pupils move between key stages.

It is suggested that teachers keep all forms of assessment as children move through primary school so that the subject lead and teachers will have a record of children's learning.



Knowledge catcher: Further coding with Scratch

Use this image to answer the following questions:

Scratch is developed by the Lifelong Kindergarten Group at the MIT Media Lab.

1 What is 'Scratch'?

2 Do you think adults who do coding (coders) use Scratch? Why or why not?

3 Why are variables important and useful?

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What about online safety?

Recognising the increasing importance of this key area, we have created an Online safety unit for each year group.

You may wish to teach this unit in the same way as the other units, on a dedicated Online Safety Day (for example, on Safer Internet Day in February each year) or spread throughout the year. See Guidance: How to fit in our Online safety units when considering the best option for your school.

Computing in EYFS

Our EYFS lessons are a natural precursor to our Year 1 Computing plans. They are designed especially for the Reception classroom and are play-based, hands-on and fun.

Please read the teacher guidance for:

- ✓ Supporting a child-led project using technology.
- ✓ Computing through continuous provision.

Whilst the technology strand is no longer a specific area in the new EYFS framework (2021), having the opportunity to develop computing skills at an early age can foster interest and confidence in technology and give pupils an advantage going into KS1.

Our EYFS units focus on the same key areas and link to Primary and Specific Areas of the ***EYFS framework 2021*** and ***Development Matters Guidance*** as detailed on individual lesson plans and on our National curriculum mapping document.

Suggested long-term plan: Computing

Overview (All year groups)

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Online safety
EYFS: Reception	Computing systems and networks 1: Using a computer		Programming 1: All about instructions	Computing systems and networks 2: Exploring hardware		Data handling: Introduction to data	
Year 1	Computing systems and networks: Improving mouse skills		Programming 1: Algorithms unplugged	Creating media: Digital imagery	*New* Programming 2: Bee-Bots		Online safety: Year 1
Year 2	Computing systems and networks 1: What is a computer?	Programming 1: Algorithms and debugging	Computing systems and networks 2: Word processing	Option 1: *New* Programming 2: MakeCode	Stop motion – Option 1: Using tablets	Data handling: International Space Station	Online safety: Year 2
Year 3	Computing systems and networks 1: Networks	*New* Programming Scratch	Microsoft Office 365: Computing systems and networks 2: Emailing	Computing systems and networks 3: Journey inside a computer	Video trailers – Option 1: Using devices other than iPads	Data handling: Comparison cards databases	Online safety: Year 3
Year 4	Google: Computing systems and networks: Collaborative learning	Programming 1: *New* Further coding with Scratch	Google: Creating media: Website design	Skills showcase: HTML	*New* Computational thinking	Data handling: Investigating weather	Online safety: Year 4
Year 5	Computing systems and networks: Search engines	*New* Programming 1: Music	Data handling: Mars Rover 1	*New* Programming 2: BBC micro:bit	Stop-motion animation – Option 1: Stop Motion Studio	Skills showcase: Mars Rover 2	Online safety: Year 5
Year 6	*NEW* Computing systems and networks: Bletchley Park and the history of computers	*NEW* Computing systems and networks: Exploring AI	Data handling 1: Big Data 1	Programming: Intro to Python	Data handling 2: Big Data 2	Skills showcase: Inventing a product	Online safety: Year 6

Suggested long-term plan: Computing

Overview - EYFS

EYFS

Unit 1	Computing systems and networks 1: Using a computer 5 lessons Learning about the main parts of a computer and how to use the keyboard and mouse. Logging in and out	**Unit 2**	Programming 1: All about instructions 5 lessons The children learn to receive and give instructions and understand the importance of precise instructions
Unit 3	Computing systems and networks 2: Exploring hardware 5 lessons Tinkering and exploring with different computer hardware and learning to operate a camera	**Unit 4**	Data handling: Introduction to data 5 lessons Children sort and categorise data and are introduced to branching databases and pictograms

Suggested long-term plan: Computing

Overview - Key stage 1

Year 1

Unit 1	Computing systems and networks: Improving mouse skills 6 lessons Knowing how to log in and navigate around a computer, developing mouse skills, learning how to drag, drop, click and control a cursor to create works of art inspired by Kandinsky and self-portraits.	**Unit 2**	Programming 1: Algorithms unplugged 6 lessons Using an unplugged approach so that algorithms, decomposition and debugging are made relatable to familiar contexts, such as dressing up and making a sandwich, while learning why instructions need to be very specific.
Unit 3	Creating media: Digital imagery 8 lessons Using creativity and imagination to plan a miniature adventure story and capture it using developing photography skills. Learn to enhance photos using a range of editing tools as well as searching for and adding other images to a project, resulting in a high-quality photo collage showcase.	**Unit 4**	*New* Programming 2: Bee-Bots 6 lessons Exploring commands, instructions and errors, the children program a Bee-Bot, practise debugging and begin thinking logically about sequencing.
Unit 5	Online safety: Year 1 6 lessons Learning about online safety, including using useful tips to stay safe when online; how to manage feelings and emotions when someone or something has upset us online; learning about the responsibility we have as online users; exploring the idea of a 'digital footprint'.		

Suggested long-term plan: Computing

Overview - Key stage 1

Year 2

Autumn 1	Computing systems and networks 1: What is a computer? 6 lessons Exploring what a computer is by identifying and learning how inputs and outputs work. Understanding how computers are used in the wider world, children design their own computerised invention.	**Autumn 2**	Programming 1: Algorithms and debugging 6 lessons Developing an understanding of what algorithms are, how to program them and how they can be developed to be more efficient through a range of unplugged and plugged-in activities.
Spring 1	Computing systems and networks 2: Word processing 6 lessons Learning about word processing, the children develop touch typing skills, explore how to stay safe online, use important keyboard shortcuts, import images into their documents and apply simple editing tools such as bold, italics, underlining and font colour.	**Spring 2**	Option 1: *New* Programming 2: MakeCode 6 lessons Using 'MakeCode' to explore what blocks do, planning and building a program.
Summer 1	Stop motion – Option 1: Using tablets 6 lessons Creating simple animations, storyboarding creative ideas and decomposing a story into small parts of action.	**Summer 2**	Data handling: International Space Station 6 lessons Learning how astronauts survive on the ISS, including identifying necessary items, designing sensor displays and exploring habitable planets. Children gain an understanding of living in space and how space exploration can benefit life on Earth.
Online safety	Online safety: Year 2 5 lessons Learning about online safety, including: what happens to information posted online; how to keep things private online; who we should ask before sharing online; describing different ways to ask for, give, or deny permission online.		

Suggested long-term plan: Computing

Overview - Lower key stage 2

Year 3

Autumn 1	Computing systems and networks 1: Networks 6 lessons Introduction to the concept of networks, learning how devices communicate. From identifying components, learn how information is shared and deepen this understanding by exploring examples of real-world networks	**Autumn 2**	*New* Programming Scratch 6 lessons Exploring Scratch by programming an animation, the children learn key coding concepts, test and debug their work and develop their ability to improve digital projects through evaluation.
Spring 1	Microsoft Office 365: Computing systems and networks 2: Emailing 6 lessons Children learn how to send emails with attachments and discover how to be a responsible digital citizen by thinking about the contents of what is sent. This unit is compatible with Microsoft devices.	**Spring 2**	Computing systems and networks 3: Journey inside a computer 6 lessons Assuming the role of computer parts and creating paper versions of computers helps to consolidate an understanding of how a computer works, as well as identifying similarities and differences between various models.
Summer 1	Video trailers – Option 1: Using devices other than iPads 6 lessons Creating book trailers	**Summer 2**	Data handling: Comparison cards databases 8 lessons By learning about records, fields and data, the children further explore the concepts of sorting and filtering.
Online safety	Online safety: Year 3 6 lessons Learning about online safety: ‘fake news’, privacy settings, ways to deal with upsetting online content, protecting our personal information on social media.		

Suggested long-term plan: Computing

Overview - Lower key stage 2

Year 4

Autumn 1	Google: Computing systems and networks: Collaborative learning 6 lessons Google Docs, Slides, Form and Sheet	**Autumn 2**	Programming 1: *New* Further coding with Scratch 6 lessons Programming a game, the children use variables, sensors and if statements, debug their projects and evaluate their designs to improve functionality.
Spring 1	Google: Creating media: Website design 6 lessons Website creation and Google Sites.	**Spring 2**	Skills showcase: HTML 6 lessons Editing the HTML of a web page to change the layout of a website and the text and images.
Summer 1	*New* Computational thinking 6 lessons Exploring computational thinking through unplugged activities and applying these to programming.	**Summer 2**	Data handling: Investigating weather 6 lessons Researching and storing data using spreadsheets, designing a weather station which gathers and records data and learning how weather forecasts are made. Children use tablets or digital cameras to present a weather forecast.
Online safety	Online safety: Year 4 6 lessons Learning how to navigate the internet in an informed, safe and respectful way.		

Suggested long-term plan: Computing

Overview - Upper key stage 2

Year 5

Autumn 1	Computing systems and networks: Search engines 6 lessons Understanding how search engines work and developing searching skills to find relevant and accurate information online.	**Autumn 2**	*New* Programming 1: Music 6 lessons Applying programming skills to plan and create a soundtrack for a particular genre.
Spring 1	Data handling: Mars Rover 1 6 lessons Identifying some of the types of data that the Mars Rover collects and explaining how the Mars Rover transmits the data back to Earth. Children will read binary numbers, and understand binary addition as well as identifying input, processing and output on the Mars Rovers.	**Spring 2**	*New* Programming 2: BBC micro:bit 6 lessons Exploring how to program the BBC micro:bit, the children create interactive projects using sensors, experiment with variables, apply conditional statements and develop an understanding of how coding brings digital devices to life.
Summer 1	Stop-motion animation – Option 1: Stop Motion Studio 6 lessons Pupils learn how to create animations using Stop Motion Studio.	**Summer 2**	Skills showcase: Mars Rover 2 6 lessons Learning about pixels and binary, creating a pixel picture and saving a JPEG as a bitmap to understand the transfer of image data. Children will learn about the 'fetch, decode, execute' cycle and its real-world applications while beginning to use 3D design tools.
Online safety	Online safety: Year 5 6 lessons Learning about potential online dangers and safety.		

Suggested long-term plan: Computing

Overview - Upper key stage 2

Year 6

Autumn 1	*NEW* Computing systems and networks: Bletchley Park and the history of computers 6 lessons Exploring code-breaking at Bletchley Park, historical figures in computing, the evolution of computers, designing a computer of the future and creating an audio advert, this unit combines lessons from archived content while retaining the progression and skills previously covered in two separate units.	**Autumn 2**	*NEW* Computing systems and networks: Exploring AI 6 lessons Exploring what AI is and how it generates text, images and code, as well as learning about creating and refining prompts to improve AI responses while also considering the ethical implications of AI and its potential to replace human roles.
Spring 1	Data handling 1: Big Data 1 6 lessons Understanding about the use of big data including barcodes, QR codes, infrared, and RFID technologies. Children will create and scan their own QR codes, manipulate real-time data in spreadsheets, and present their findings. They also analyse transport data to understand its usefulness to commuters.	**Spring 2**	Programming: Intro to Python 6 lessons Learning the fundamentals of the programming language of Python, they will test, change and explain what their program does. Children use loops and explain what repeats do and what the parts of the loop do while recognising that computers choose random numbers and decompose the program into an algorithm.
Summer 1	Data handling 2: Big Data 2 6 lessons Understanding data usage through the use of mobile data vs wi-fi, the Internet of Things, and big data. Identifying high/low data activities and preparing presentations on using Big Data/IoT to improve school efficiency while respecting privacy.	**Summer 2**	Skills showcase: Inventing a product 6 lessons Designing a new electronic product and using CAD software to design appropriate housing for it. Developing skills in website design, video editing, and persuasive language to promote their product. Evaluating and adapting existing code, debugging programs, and searching for accurate information online.
Online safety	Online safety: Year 6 7 lessons Learning how to navigate the internet in an informed, safe and respectful way.		