Computing
INTENT - to what do we aspire for our children?

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

Source: National Curriculum (updated Jan 21)

At HPPS computing develops the school's 4 key drivers in the following ways:

Excellence
- Proud of their learning in computing
- Able to articulate their successes and learning journey; showcase their ideas and creativity

Equity
We believe that all children regardless of need will engage in a curriculum that will enable them to become competent and responsible users of technology;
- Spiral curriculum with key knowledge made explicit and building complexity over time
- Explicit scaffolding of oracy
- Knowledge organisers used to reduce split attention effect
- Explicit teaching of tier 2 and subject specific vocabulary
- Make reasonable adaptations to computing lessons and resources

Character
- Respectful use of resources and equipment
- Be aware of online safety issues and be able to deal with any problems in a responsible and appropriate manner
- Use technology responsibly
- Understanding the impact of their words and actions on others
- Work collaboratively to use technology successfully

Community
- **B**uild and participate in a safe and responsible online community
- Understand the importance that computing will have in their social and personal futures; education and working life
- Be critical thinkers and be able to understand how to make informed digital choices in the future

Aims of the Computing Curriculum
Our aims, inline with the national curriculum, ensure that all pupils:
- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation;
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems;
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems; and
- are competent, confident and creative users of information and communication technology
- are responsible users of technology and recognise the risks associated with an online presence
- are critical consumers of online information

Curriculum Overview
Kapow computing scheme of work has been deliberately chosen as our scheme of work for the following reasons:
- Authored by primary computing specialists using free readily-available software
- In-built CPD for teachers: learn as you plan

- A full scheme of work, easily adaptable to individual teaching needs
- Clear progression of skills and learning throughout EYFS, KS1 & KS2
- Relevant cross-curricular opportunities
- Content mapped to Education for a Connected World framework

There are **three core strands** that run throughout the Kapow Computing Scheme of work:
- Computer science
- Information technology
- Digital literacy

Long term sequence

The Kapow Primary scheme is organised into 5 key areas, creating a cyclical route through which pupils can develop their computing knowledge and skills, by revisiting and building on previous learning:
- Computer Systems and networks
- Programming
- Creating media
- Data handling
- Online safety

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Online Safety
EYFS	Set up continuous provision in your classroom: Computing through continuous provision	Computing systems and networks / Using a computer / Learning about the main parts of a computer and how to use the keyboard and mouse. Learning how to log in and out.	Programming 1 / All about instructions / The children learn to receive and give instructions and understand the importance of precise instructions.	Computing systems and networks / Exploring hardware / Tinkering and exploring with different computer hardware and learning to operate a camera.	Programming 2 / Programming Bee-Bots / Children learn about directions, experiment with programming a Bee-bot/Blue-bot and tinker with hardware.	Data handling / Introduction to data / Children sort and categorise data and are introduced to branching databases and pictograms.	
Year 1	Computing systems and networks / Improving mouse skills	Programming 1 / Algorithms unplugged	Skills showcase / Rocket to the moon	Programming 2 / Programming Bee-bots / Option 1: Bee-Bots / Option 2: Virtual Bee-bots	Creating media / Digital imagery / Option 1: Google / Option 2: Microsoft Office 365	Data handling / Introduction to data	Online safety / Online safety Y1 (4 lessons)
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: Google / Option 2: Microsoft Office 365	Programming 2 / Programming: ScratchJr	Creating media / Stop Motion / Option 1: Using tablet devices / Option 2: Using cameras / Option 3: Devices without cameras	Data handling / International Space Station	Online safety / Online safety Y2

Year 3	Computing systems and networks 1	Programming	Computing systems and networks 2	Computing systems and networks 3	Creating media	Data handling	Online safety
	Networks and the internet Option 1: Google Option 2: Microsoft Office 365	Programming: Scratch	Emailing Option 1: Google Option 2: Microsoft Office 365	Journey inside a computer	Video trailers Option 1: Using devices other than iPads. Option 2: Using iPads	Comparison cards databases Option 1: Google Option 2: Microsoft Office 365	Online safety Y3 (4 lessons)

Year 4	Computing systems and networks	Programming 1	Creating media	Skills showcase	Programming 2	Data handling	Online safety
	Collaborative Learning Option 1: Google Option 2: Microsoft Office 365	Further coding with Scratch Option 1: Google Option 2: Microsoft Office 365	Website design Option 1: Google Option 2: Microsoft Office 365	HTML	Computational thinking	Investigating weather Option 1: Google Option 2: Microsoft Office 365	Online safety Y4 (6 lessons)

Year 5	Computing systems and networks	Programming 1	Data handling	Programming 2	Creating media	Skills showcase	Online safety
	Search engines Option 1: Google Option 2: Microsoft Office 365	Programming music Option 1: Sonic Pi Option 2: Scratch	Mars Rover 1	Micro:bit	Stop motion animation Option 1: Stop motion studio Option 2: Using cameras	Mars Rover 2	Online safety Y5

Year 6	Computing systems and networks	Programming	Data handling	Creating media	Data handling	Skills showcase	Online safety
	Bletchley Park Option 1: Google Option 2: Microsoft Office 365	Intro to Python	Big data 1	History of computers Option 1: Google Option 2: Microsoft Office 365	Big data 2	Inventing a product Option 1: Google Option 2: Microsoft Office 365	Online safety Y6 (6 lessons)

IMPLEMENTATION - how will we deliver the curriculum?

Linking curriculum and pedagogy

The Kapow modules enable pupils to study in depth key computational understanding, digital skills and vocabulary. Each module aims to activate and build upon prior learning, including EYFS, to ensure better cognition and retention. Each module is carefully sequenced to enable pupils to purposefully layer learning from previous sessions to facilitate the acquisition and retention of key knowledge. Individual modules and lessons build on knowledge that has previously been taught. Outcomes are revisited either later in the year or in the following year as part of a spaced retrieval practice method to ensure pupils retain key knowledge and information.

Year 1 - Year 6

Computing is taught in a modular approach with each year group from Year 1 to Year 6 having 3 module sessions each week on a 3-week rotation (see below), meaning there is more frequent teaching of Computing over the course of a year. This takes into account some key research and evidence including:

- Forgetting curve - we want to make sure we ease the forgetting curve by coming back to those key learning points after a shorter period of time
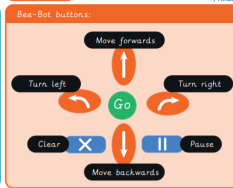- Retrieval and spaced retrieval practice - powerful toolkit to strengthen learning and memory

Knowledge Organisers

Accompanying each module is a Knowledge Organiser which contains key vocabulary, information and concepts which all pupils are expected to understand and retain. Knowledge organisers help pupils acquire the content of each module and are continually referenced through planning and in the classroom. Examples from Year 1 and 5 are shown below.
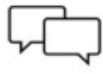
Progression of Skills

The Progression of Skills document shows how understanding and application of key concepts and skills builds year on year. An example is shown below:

Kapow Primary	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computer science							
Information technology / **Digital literacy**	• Recognising that a range of technology is used in places such as homes and schools • Learning to log in and log out • 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	• 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 how we 'share' information on 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 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 who personal information should/ should not be shared with	• 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 • Learning about different forms of advertising on the internet.	• 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 bullying concerns

Lesson Design

Connect   Explain   Example   Attempt   Apply   Challenge

Each lesson follows the model above.
- CONNECT to prior knowledge
- EXPLAIN new content
- give an EXAMPLE of new learning
- Pupils ATTEMPT new learning with scaffolding
- APPLY new learning independently
- Pupils are CHALLENGED to integrate learning with prior knowledge

In every computing lesson you would expect to see;
- Vocabulary explicitly taught and used by the pupils
- Knowledge notes and organisers used to scaffold the learning
- What success looks like; made clear
- Respectful use of materials and technology

We aim to **enrich the curriculum** with:
- Annual online safety day
- Anti-bullying week, which includes an online safety focus

IMPACT - how do we know our curriculum is effective?

Pupil Voice:
- use computing vocabulary
- talk about computing skills
- talk about the 'why' behind the work i.e. why online is vital to their safety
- explain how current learning builds on previous knowledge
- explain how they have made progress regardless of starting point

High quality outcomes: Book study...
- demonstrates pride and effort
- captures increasing understanding of computing concepts and knowledge
- demonstrates a clear sequence of learning
- vocabulary used correctly where appropriate