



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 2021)

At Stoke Park Primary School computing develops the school's three core values in the following ways:

Be proud

- Proud of their learning in computing
- Able to articulate their successes and learning journey; showcase their ideas and creativity
- Respectful use of resources and equipment

Be Kind

- 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

Strive for Success

- 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

Golden Thread: Oracy

At Stoke Park Primary, we recognise the vital role that oracy plays in the lives of our children, both during their time in primary school and for the rest of their lives. Research shows that oracy not only acts as a powerful tool for learning but is a key skill in itself which employers actively seek. By ensuring that children have explicit opportunities to develop their oracy skills as well as opportunities to learn through oracy across the curriculum, we aspire to create young adults who are able to work confidently, articulately and collaboratively.

We promote oracy through Computing by teaching vocabulary that allows the children to explain, discuss, debate and share their ideas when thinking about their own projects and solving problems.



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;
- 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; and
- use talk as a tool for learning.

Long term sequence

There are three strands that run throughout the Kapow Computing Scheme of work:

- Computer science
- Information technology
- Digital literacy

The *Kapow Primary* scheme is organised into five 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



EYFS:

Understanding the World

Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

Computing is covered in Understanding the world	Nursery – how is this achieved?	Reception – how is this achieved?	Key vocabulary	Core Books that link to foundational experiences & knowledge
Children require access to a range of technologies, both digital and non-digital in their early lives. Exploring with different technologies through play provides opportunities to develop skills that children will go on to use in their lifetimes.	Children are taught to operate simple equipment, for example turning on a CD player. Children show skills in making different toys work by pressing buttons, lifting flaps etc. Children know that information can be retrieved from the internet. Children begin to form an understanding of cause and effect, for example making a string puppet.	Children complete a simple program on electronic devices Children can create simple content, for example a video or voice recording. Children can begin to understand that information can be retrieved from the internet and begin to use the internet under the supervision and guidance of adults. Children learn about online safety.	computer internet ipad touchscreen mouse keyboard screen interactive whiteboard button	A selection of books allow children to explore the role of technology in the world around them.

Continuous Provision Play experiences with provocations for Computing based thinking and talk

Children:

- have access to CD players and a selection of CDs;
- take photos of their work, themselves, the classroom and their local environment;
- are given the opportunities to cook and use tools such as an electric whisk; and
- are given toys with pulling mechanics and levers.

	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: Scratch Jr	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)

Knowledge Organisers

Knowledge organisers for each unit support pupils in building a foundation of factual knowledge by encouraging recall of key facts and vocabulary. Examples of Year 1 and Year 5 knowledge organisers shown below:

Programming - Bee Bot

Algorithm	A clear set of instructions to carry out a task.
Bee-Bot	A small, programmable four robot, with seven buttons (forwards, backwards, turn right, turn left, go, pause and clear).
Computing code	Words, numbers and symbols that make a computer language.
Computer program	A series of instructions, that are written for a computer to follow. Also known as apps.
Explain	Give clear information about something to someone.
Explore	Look at something new to learn more about it.
Instructions	A list of commands and directions on how to do something.
Predict	To make a guess.
Tinker	To explore and play with something to discover what it can do.
Video	Moving pictures, that make up a film or cartoon.

Key facts

Mars Rover 1

Binary code	A code used in computers, based around the binary values of 0 and 1.
Data	Information used for a specific purpose or investigation.
Data transmission	The movement of information from one or more points to another.
Discovery	When something is intentionally or unintentionally found.
Distance	The amount of space between two places or objects.
Input	Information sent to a computer by an input device such as a keyboard or mouse for processing.
Mars Rover	A robotic vehicle, that explores, investigates and returns data about the terrain on Mars.
Moon	Orbits round planet Earth and is Earth's only natural satellite.
Numerical data	Information that is based on numbers and digits.
Output	Information or data that is sent by the computer to an output device such as a printer or speakers.
Planet	A large natural object that orbits around a star.
Radio signal	A radio wave that is sent or received to somewhere.
Scientist	A person who studies within the fields of Science, such as Physics, Biology and Chemistry.
Sequence	A set order or pattern for something to follow.
Signal	A voltage, current or electromagnetic wave that is either sent or obtained.
Computer simulation	Computer generated imitation of something such as a program test or product prototype.
Space (astronomy)	A vast area around and beyond planet Earth, which is not inhabited.

Key facts

The Mars Rover had to travel 390,000km to get to Mars, it took eight and a half months.

It is approximately 31,666,666 double-decker buses in distance!

Binary
When a robot thinks independently, it needs to be able to calculate a range of data. All decisions carried out by a robot, or any computer, are done in binary - including the Mars Rover.

Binary values	Decimal value
0	zero
1	one
2	two
3	three
4	four
5	five
6	six
7	seven
8	eight
9	nine
10	ten

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	<ul style="list-style-type: none"> Recognising that a range of technology is used in places such as homes and schools 	<ul style="list-style-type: none"> Logging in and out and saving work on their own account 	<ul style="list-style-type: none"> Understanding that personal information should not be shared on the internet. 	<ul style="list-style-type: none"> Learning to be a responsible digital citizen; understanding their responsibilities to treat others respectfully and recognising when digital behaviour is unkind 	<ul style="list-style-type: none"> Recognising what appropriate behaviour is when collaborating with others online 	<ul style="list-style-type: none"> Learning about how permissions work and how to change them 	<ul style="list-style-type: none"> Understanding the importance of secure passwords and how to create them, along with two-step authentication
Digital literacy	<ul style="list-style-type: none"> Learning to log in and log out 	<ul style="list-style-type: none"> Understand the importance of a password 	<ul style="list-style-type: none"> Learning how to be respectful to others when sharing content online. 	<ul style="list-style-type: none"> Learning about cyberbullying 	<ul style="list-style-type: none"> Recognising that information on the Internet might not be true or correct and that some sources are more trustworthy than others 	<ul style="list-style-type: none"> Identifying possible issues with online communication 	<ul style="list-style-type: none"> Using search engines safely and effectively
	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 		<ul style="list-style-type: none"> Learning that not all emails are genuine, recognising when an email might be fake and what to do about it 	<ul style="list-style-type: none"> Learning about different forms of advertising on the internet. 	<ul style="list-style-type: none"> Considering the effects of screen-time on physical and mental wellbeing 	<ul style="list-style-type: none"> Recognising that updated software can help to prevent data corruption and hacking
		<ul style="list-style-type: none"> Recognising when someone has been unkind online 		<ul style="list-style-type: none"> Learning that not all information on the internet is factual 		<ul style="list-style-type: none"> Learning about online bullying and where to seek advice 	<ul style="list-style-type: none"> Considering their digital footprint and online reputation and future implications they may have
		<ul style="list-style-type: none"> Learning some top tips for staying safe online 		<ul style="list-style-type: none"> Understanding who personal information should/ should not be shared with 			<ul style="list-style-type: none"> Learning about how to collect evidence and report online bullying concerns
		<ul style="list-style-type: none"> Understanding how we 'share' information on the internet 					

IMPLEMENTATION - how will we deliver the curriculum?

Linking curriculum and pedagogy:

Our computing curriculum is taught across each year in units of work (KS2) or modules (KS1) that enable pupils to study in depth key skills and vocabulary and demonstrate their understanding. Each module builds upon prior learning and these are strategically planned throughout the academic year with opportunities to introduce and revisit key concepts in order to deepen pupil understanding and embed learning. Computing lessons follow the *Kapow Primary* schemes of work.

Lesson design

Computing lessons may vary depending on the element being taught; but it is expected that every lesson has the following elements:

- Connect to prior learning which leads onto next key learning
- Explicit opportunities for talk to develop learning
- Computing vocabulary explicitly taught
- Skills or knowledge based learning objective and success criteria made clear
- Modelling of learning
- Review of learning
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Curriculum enrichment

- Additional focus is placed on being safe online for events such as Safer Internet Day (typically in February of each year).
- Anti-bullying week (typically November of each year) includes content and a focus on behaviour online, especially with increasing risk of exposure to inappropriate comments online and on social media.

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

Children showcase skills at various points in the curriculum, in order to:

- demonstrate pride and effort
- capture increasing understanding of computing concepts and knowledge
- demonstrate a clear sequence of learning
- use technical vocabulary accurately where appropriate
- demonstrate that learners are thinking critically about the world of computing