Computing

Purpose of Study
- To equip pupils with computational thinking and creativity to understand and change the world.
- To have deep links with mathematics, science and design and technology, to provide insights into both natural and artificial systems.
- To teach the principles of information and computation, how digital systems work and how to put this knowledge to use through programming.
- To building on knowledge and understanding, to master the ability to use information technology to create programs, systems and a range of content.
- To ensure 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.

Aim
- To be able to understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation **(Computer Science)**
- To be able to analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems **(Computer Science)**
- To be able to evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems **(Information Technology)**
- To be responsible, competent, confident and creative users of information and communication technology **(Digital Literacy)**

Computer Science	The understanding of coding and programming across a range of physical devices and digital resources.
Information Technology	The range of skills required to operate and manipulate specific programs, systems, and content.
Digital Literacy	The knowledge required to use technology safely and to evaluate and react to any potential risks of the online/digital world.

Attainment target
- Pupils' progress is assessed through skills being taught, ensuring that each and every pupil is successful.
- Attainment and progress are linked to the National Curriculum expectations.

Useful Links
- BBCBitesize
- Scratch Coding
- Scratch Games
- STEM

Scheme of work

Kapow Primary	**Kapow Primary**

Intent

- The Computing scheme aims to instil a sense of enjoyment around using technology and to develop pupil's appreciation of its capabilities and the opportunities technology offers to, create, manage, organise and collaborate. 'Tinkering' with software and programs forms a part of the ethos of the scheme as we want to develop pupils' confidence when encountering new technology, which is a vital skill in the ever evolving and changing landscape of technology. Through our curriculum, we intend for pupils not only to be digitally competent and have a range of transferable skills at a suitable level for the future workplace, but also to be responsible online citizens.

- The scheme of work enables pupils to meet the end of Key Stage Attainment targets outlined in the National curriculum and the aims align with those in the National curriculum. When used in conjunction with Kapow's RSE & PSHE scheme, our Computing scheme of work also satisfies all the objectives of the DfE's Education for a Connected World framework. This guidance was created to help equip children for life in the digital world, including developing their understanding of appropriate online behaviour, copyright issues, being discerning consumers of online information and healthy use of technology.

Implementation

The implementation of the curriculum relates to how the learning is going to be delivered across your school, taking the intent of the learning and translating it into a progressive and effective curriculum.

- The National curriculum purpose of study states:
'*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*'

- Therefore, the cheme of work is designed with three strands which run throughout:
  - **Computer science**
  - **Information technology**
  - **Digital literacy**

- Our Curriculum overview shows which of our units cover each of the National curriculum attainment targets as well as each of these three strands.

- Our Progression of skills shows the skills that are taught within each year group and how these skills develop year on year to ensure attainment targets are securely met by the end of each key stage.

- The 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**

- The implementation of the Computing scheme ensures a broad and balanced coverage of the National curriculum requirements and our 'Skills showcase' units provide pupils with the opportunity to learn and apply transferable skills. Where meaningful, units have been created to link to other subjects such as science, art and music to enable the development of further transferable skills and genuine cross-curricular learning.

- Lessons incorporate a range of teaching strategies from independent tasks, paired and group work as well as unplugged and digital activities. This variety means that lessons are engaging and appeal to those with a variety of learning styles. Differentiated guidance is available for every lesson to ensure that lessons can be accessed by all pupils and opportunities to stretch pupils' learning are available when required. Knowledge organisers for each unit support pupils in building a foundation of factual knowledge by encouraging recall of key facts and vocabulary.

- Strong subject knowledge is vital for staff to be able to deliver a highly effective and robust computing curriculum. Each of our units of lessons include teacher videos to develop subject knowledge and support ongoing CPD. Further CPD opportunities can also be found via our webinars with our Computing subject specialists. Kapow has been created with the understanding that many teachers do not feel confident delivering the computing curriculum and every effort has been made to ensure that they feel supported to deliver lessons of a high standard that ensure pupil progression.

E-Safety and Digital Citizenship

- A key part of implementing our computing curriculum was to ensure that safety of our pupils is paramount. We take online safety very seriously and we aim to give children the necessary skills to keep themselves safe online. Children have a right to enjoy childhood online, to access safe online spaces and to benefit from all the opportunities that a connected world can bring them, appropriate to their age and stage.

Impact
This relates to how staff identify that the curriculum is having a positive impact on pupils' learning, how to identify gaps in their learning and how to fill these.

- The impact of the scheme can be constantly monitored through both formative and summative assessment opportunities. Each lesson includes guidance to support teachers in assessing pupils against the learning objectives and each unit has a unit quiz and knowledge catcher which can be used at the start and/ or end of the unit.

- After the implementation of the Computing scheme, pupils should leave school equipped with a range of skills to enable them to succeed in their secondary education and be active participants in the ever increasing digital world.

- The expected impact of following the Computing scheme of work is that children will:
  - Be critical thinkers and able to understand how to make informed and appropriate digital choices in the future.
  - Understand the importance that computing will have going forward in both their educational and working life and in their social and personal futures.
  - Understand how to balance time spent on technology and time spent away from it in a healthy and appropriate manner.
  - Understand that technology helps to showcase their ideas and creativity. They will know that different types of software and hardware can help them achieve a broad variety of artistic and practical aims.
  - Show a clear progression of technical skills across all areas of the National curriculum - computer science, information technology and digital literacy.
  - Be able to use technology both individually and as part of a collaborative team.
  - Be aware of online safety issues and protocols and be able to deal with any problems in a responsible and appropriate manner.
  - Have an awareness of developments in technology and have an idea of how current technologies work and relate to one another.
  - Meet the end of key stage expectations outlined in the National curriculum for Computing

Long Term Plan

CYCLE A	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception	Set up continuous provision in your classroom: Computing through continuous provision	Computing systems and networks: Using a computer	Programming 1: All about instructions	Computing systems and networks: Exploring hardware	Programming 2: Programming Bee-Bots	Data handling: Introduction to data
Years 1 / 2	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)					
Years 3 / 4	Computing systems and networks 1: Networks and the internet Option 1: Google) Option 2: Microsoft Office 365	Programming 1: Programming: ScratchJr	Computing systems and networks 2: Emailing Option 1: Google Option 2: Microsoft Office 365	Computing systems and networks 3: Journey inside a computer	Creating media: Video trailers Option 1: Using devices other than iPads , Option 2: Using iPads	Data handling: Comparison cards databases Option 1: Google Option 2: Microsoft Office 365
	Online Safety: Online safety Y3 (4 lessons)					
Years 5 / 6	Computing systems and networks: Search engines Option 1: Google Option 2: Microsoft Office 365	Programming 1: Programming music Option 1: Sonic Pi , Option 2: Scratch	Data handling: Mars River 1	Programming 2: Microbit	Creating media: Stop motion animation Option 1: Stop motion studio Option 2: Using cameras	Skills showcase: Mars River 2
	Online Safety: Online safety Y5					

CYCLE B	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception	Set up continuous provision in your classroom: Computing through continuous provision	Computing systems and networks: Using a computer	Programming 1: All about instructions	Computing systems and networks: Exploring hardware	Programming 2: Programming Bee-Bots	Data handling: Introduction to data
Years 1 / 2	Computing systems and networks 1: What is a computer?	Programming 1: Algorithms and debugging	Computing systems and networks 2: Word processing	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 (4 lessons)					

Years 3 / 4	Computing systems and networks: Collaborative Learning Option 1: Google Option 2: Microsoft Office 365	Programming 1: Further coding with Scratch Option 1: Google Option 2: Microsoft Office 365	Creating media: Website design Option 1: Google Option 2: Microsoft Office 365	Skills showcase: HTML	Programming 2: Computational thinking	Data handling: Inverstigating weather
	Online Safety: Online safety Y4 (6 lessons)					
Years 5 / 6	Computing systems and networks: Bletchley Park Option 1: Google Option 2: Microsoft Office 365	Programming: Intro to Python	Data handling: Big data 1	Creating media: History of Computers	Data handling: Big data 2	Skills showcase: Inventing a product
	Online Safety: Online safety Y6 (6 lessons)					