



# Computing Overview



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## The Curriculum – our approach

Appleton Primary School strives to drive the curriculum through a love of reading. We are creating opportunities for our children to become aspirational in all areas of their lives through a structured build-up of knowledge and skills. We are committed to meeting the needs of all the children in our school. We offer a curriculum which remove barriers to learning by being broad and balanced and building on the knowledge, understanding and skills of the children, whatever their starting points, as they progress through our Foundation Unit and each Key Stage. Our aim is for children to be successful, resilient, independent and motivated learners in readiness for their next stage of education and beyond.

Using the children's interests through talking to pupils, their families and the local community we ensure we capture the enthusiasm of the children to take their development forward. We have a two-year programme of 6 themes across the year groups which captures the children's imagination and interests and ensures that there is a progressive sequence of skills and knowledge based on the National Curriculum. Each theme is supported by an appropriate text to nurture the children's love of reading and quest for knowledge. Our teaching sequences ensure that we teach skills and knowledge and provide sufficient opportunities for pupils to apply these independently. Through the consistent use of assessment, we can identify and address misconceptions to ensure learning is securely embedded and children can remember what they have learned.

At Appleton, we believe that all children are entitled to a broad, balanced and relevant curriculum through which we support children with additional needs. All children are encouraged to achieve their full potential and to be included in the social and academic life of the school. We aim to provide educational experiences that reflect the individual needs of children, appropriate to their level of ability. For some pupils with additional needs, there are times when the curriculum will need to be adapted to best meet their needs.

We will ensure our pupils have a wide range of cultural experiences and develop an understanding of opportunities available to them, so they leave us with high aspirations. We endeavour to introduce our whole community to the rich and diverse world in which we live in. To achieve this we promote tolerance and respect towards others in our both community and society as a whole using our PSHE programme, which runs throughout the school. Successes are celebrated and children are taught respect, empathy and fundamental British values and how they can contribute to our "Appleton family" and the wider world in which we live.

### Our Curriculum Drivers

**Reading** is the key for learning

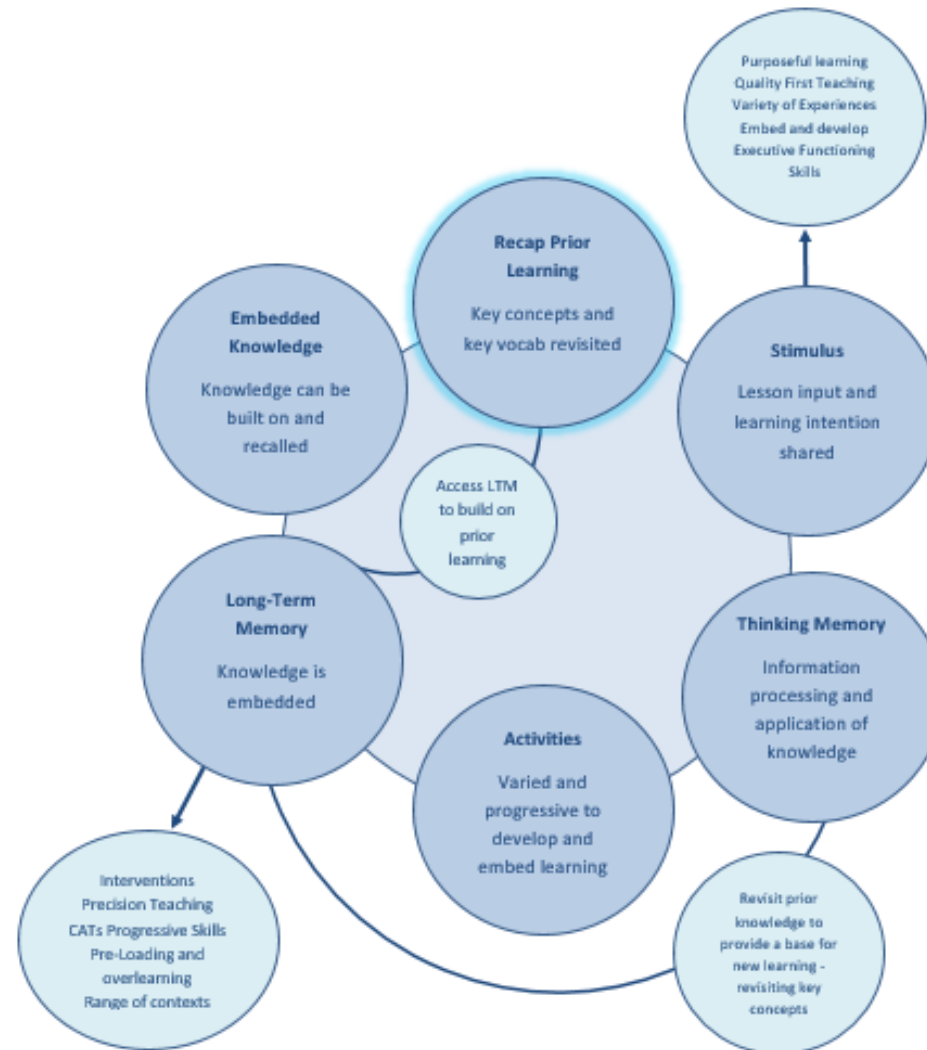
**PSHE** through developing resilience and promoting wellbeing our pupils can learn

**Vocabulary** we aim to extend pupils' language to enable them to learn from a wide range of experiences in our language rich curriculum

**Fundamental Values** promoting empathy and British values are at the core of our "Appleton family" approach.

## Working Memory Model

With the collation of all this extensive research, we have generated a 'Working Memory Model' which enables teachers to ensure that learning is robust and that all pupils are using their interconnected schema to their full potential. Fundamental to our model is “grow what you know” and retrieval of prior learning.



## A Broad and Balanced Curriculum at Key Stage 2






We ensure that we celebrate the talents of all pupils and provide everyone with opportunities to shine.

Reading, Writing and Maths are taught daily. Pupils who need phonic support continue on the Read Write Inc. and Fresh Start programmes. Science and PE are taught for 2 hours each week. RE and PSHE are taught for 1 hour each week. Foundation subjects are blocked over half term units. Y4 and 5 have Wider Opportunities for Music taught by a brass specialist. PE specialists and sport organisations regularly visit the school to teach pupils in lessons.











































### Key Concepts (Big Ideas)

Through collaboration with subject leaders and subject specialists across our secondary schools, each subject has identified key concepts (big ideas) for their subject. These key concepts are the skills and knowledge essential to pupils achieving and exceeding expected standards in that specific subject. Key concepts are subject specific and build progressively as pupils move through the school. When pupils encounter a key concept, they will revisit other topics where they learnt about the same concept to enable them to make connections between different learning and build the schema they need. Thus they will have opportunities to link new learning to prior knowledge within a key concept to build a rich and deep knowledge of the big ideas in each subject. Knowledge is empowering and provides a foundation for success. We accept that the more children know, the more they can learn

### Computing

				
Programming	Data and Information	Computer Systems & Networks	Creating Media	Operating devices / Searching and selecting information / Using devices safely and responsibly
Computer Science		Information Technology		Digital Literacy

# Key Concept Year Group Mapping

	Autumn	Spring	Summer
EYFS	In EYFS, we will incorporate the key concepts of Computing throughout our curriculum.		
Year 1	  Technology Around Us Digital Literacy	  Moving a Robot Digital Literacy	   Pictograms Digital Music Digital Literacy
Year 2	  IT Around Us Digital Literacy	  Robot Algorithms Digital Literacy	   Grouping Data Digital Writing Digital Literacy
Year 3	  Connecting computers Digital Literacy	   Branching Databases Sequencing Sounds Digital Literacy	  Stop-Frame Animation Digital Literacy
Year 4	  The Internet Digital Literacy	  Repetition in Shapes Digital Literacy	   Data logging Audio Editing Digital Literacy
Year 5	  Introduction to Vector Graphics Digital Literacy	  Systems and Searching Digital Literacy	   Selection in Physical Computing Flat-file Databases Digital Literacy
Year 6	  Sensing Movement Variables in Games	  Communication and Collaboration	   Webpage Creation Spreadsheets Digital Literacy

## Key concepts (Big Ideas) in **COMPUTING**

Pupils will develop their knowledge of computing through the three strands of **computer science**, **information technology** and **digital literacy**. The computing curriculum will equip pupils with the knowledge to become creators of digital technologies and digital artefacts.

**COMPUTER SCIENCE:** This focuses on programming & algorithms and data & information. This will provide pupils with the foundational knowledge needed to understand the rest of the curriculum.

### Programming



Pupils will learn how to interpret, create and evaluate algorithms. They will be taught to program to accomplish specific goals and to detect and correct errors. Pupils will implement algorithms as programs on digital devices, working with various forms of input and output. They will use sequence, selection and repetition in programs.

### Data and information



Pupils will learn how to collect, analyse, evaluate and present data and information

**INFORMATION TECHNOLOGY:** Studying this aspect will give children the knowledge of how computers are used in society. They will also explore how computers are used to create digital artefacts such as videos, animations or 3D models.

### Computer systems and networks



Pupils will learn about computer systems, networks and how they are used. They will learn about the opportunities for communication and collaboration offered by networks and how to use these services safely and respectfully. They will also learn about the internet and different types of hardware and software.

### Creating media





Pupils will learn about the design and development of digital media in different forms. They will learn how to collaborate online, evaluate online content and how to communicate, create and present content in a respectful and responsible way.



**DIGITAL LITERACY:** This is woven through the key concepts above. Pupils will learn how to...



- **operate devices**
- **search and select information**
- **use digital devices safely and responsibly**

Knowledge and skills sequencing		COMPUTING						
		EYFS	Y1	Y2	Y3	Y4	Y5	Y6
COMPUTER SCIENCE	<p><b>Programming</b></p>  <p>Related digital media content: Operating devices</p>	<p>Program a floor robot to follow a simple set of instructions. (N)</p> <p>Completes a simple program on an electronic device to achieve a goal (beebots). (R)</p>	<p>Understand what commands are</p> <p>Use commands to control a device</p> <p>Choose commands to achieve a goal</p> <p>Understand that a program is a set of commands</p> <p>Debug and improve programs</p> <p>Know that an algorithm is a set of instructions</p> <p><b>Suggested TC unit – Moving a robot</b></p>	<p>Understand that an algorithm is a set of instructions.</p> <p>Understand that computers read and follow algorithms without thought.</p> <p>Make predictions about programs.</p> <p>Write a program to achieve an aim.</p> <p>Debug and improve programs</p> <p><b>Suggested TC unit – Robot Algorithms</b></p>	<p>Understand that commands have outcomes.</p> <p>Write a program from a task description.</p> <p>Develop, adapt and refine a program</p> <p>Develop a process for debugging.</p> <p><b>Suggested TC unit – Sequencing sounds</b></p>	<p>Develop understanding in a <b>different environment</b>.</p> <p>Use loops in programs.</p> <p>Compare infinite loops and count- controlled loops.</p> <p>Debug and improve programs</p> <p><b>Suggested TC unit – Repetition in shapes</b></p>	<p>Control a simple circuit connected to a computer.</p> <p>Design write and create a program that uses selection.</p> <p>Write programs including controlled loops.</p> <p><b>Suggested TC unit – Selection in physical computing</b></p>	<p>Understand what variables are.</p> <p>Know how to use variables in programs.</p> <p>Write a purposeful program using variables</p> <p>Debug, improve and evaluate projects</p> <p>Write code to control a device for a purpose</p> <p>Install software onto hardware</p> <p><b>Suggested TC unit – Variables in games Sensing movement</b></p>
	<p><b>Data and information</b></p>  <p>Related digital media content: Operating devices</p> <p>Searching and selecting information</p>	<p>Group objects by type. (N)</p> <p>Discuss data and information and understand that things can be categorised using labels. (R)</p> <p>Create tally charts. (R)</p>	<p>Understand that objects can be labelled and grouped.</p> <p>Be able to label and group objects based on properties.</p> <p>Choose searches and compare groups.</p> <p>Debug and improve.</p> <p><b>Suggested TC unit – Grouping data</b></p>	<p>Understand that data can be represented in pictograms and tally charts.</p> <p>Be able to present and discuss data.</p> <p>Draw conclusions from represented data.</p> <p><b>Suggested TC unit - Pictograms</b></p>	<p>Understand that attributes can be used to refine data.</p> <p>Select appropriate attributes required to find desired data.</p> <p>Understand what a branching database is.</p> <p>Use a branching database to sort information.</p> <p>Compare branching databases/pictograms.</p> <p><b>Suggested TC unit – Branching databases</b></p>	<p>Understand that data can be collected over time.</p> <p>Be able to use a datalogger.</p> <p>Select what data need to be collected.</p> <p>Answer questions using data.</p> <p><b>Suggested TC unit – Data logging</b></p>	<p>Compare paper and computer-based databases</p> <p>Explain that tools can be used to select specific data</p> <p>Apply knowledge of a database to ask and answer real-world questions</p> <p><b>Suggested TC unit – Flat-file databases</b></p>	<p>Understand how spreadsheets organise data.</p> <p>Manipulate data sets using spread- sheets.</p> <p>Write and use formulas.</p> <p>Calculate using spreadsheets.</p> <p><b>Suggested TC unit – An introduction to spreadsheets</b></p>



		EYFS	Y1	Y2	Y3	Y4	Y5	Y6
INFORMATION TECHNOLOGY	<p><b>Computer systems and networks</b></p>  <p>Related digital media content: Operating devices</p> <p>Searching and selecting information</p> <p>Using devices safely and responsibly</p>	<p>To know that a computer has a mouse and a key-board and be able to recognise them. (N).</p> <p>To use a mouse to manipulate a program. (R)</p> <p>To use a keyboard and understand keys represent letters and numbers. (R)</p> <p>To understand that a tablet is different to a computer in some ways. (R)</p>	<p>Understand what technology is.</p> <p>Know what technology they have in their lives.</p> <p>Be able to use a mouse and a keyboard.</p> <p>Be able to open a file.</p> <p>Be able to create a typed document and save it.</p> <p><b>Suggested TC unit – Technology around us</b></p>	<p>Develop the understanding of where technology can be found in the world.</p> <p>Be able to name the types of technology found in shops, schools and at home.</p> <p>Understand why we use IT.</p> <p><b>Understand how to use IT safely.</b></p> <p><b>Suggested TC unit – Information technology around us</b></p>	<p>Understand how inputs and outputs work in digital technology and use this to achieve an aim.</p> <p>Understand why we choose to use technology.</p> <p>Understand the difference between digital and analogue outcomes.</p> <p>Begin to understand how networks connect people and how they work.</p> <p><b>Suggested TC unit – Connecting Computers</b></p>	<p>Understand how computers are physically connected in networks.</p> <p>Start to understand the role of some of the devices in a network.</p> <p>Know what the internet and WWW are and that they are different</p> <p>Understand that people create web page.</p> <p>Understand that not all information on the WWW is accurate.</p> <p><b>Suggested TC unit – The internet</b></p>	<p>Understand what a digital system is.</p> <p>Recognise the role of computer systems in our lives</p> <p>Understand that the internet forms part of some systems.</p> <p>Develop from the understanding of the internet to understand what the WWW is.</p> <p>Be able to carry out specific searches on the WWW.</p> <p>Understand how search engines work.</p> <p><b>Suggested TC unit – Systems and Searching</b></p>	<p>Know what an IP address is.</p> <p>Know that the internet can be used to communicate.</p> <p>Understand how systems and networks enable collaborative working.</p> <p>Be able to work collaboratively online</p> <p>Evaluate methods of online communication</p> <p>Understand how to stay safe when communicating online.</p> <p><b>Suggested TC unit – Communication and Collaboration</b></p>
	<p><b>Creating media</b></p>  <p>Related digital media content: Operating devices</p>	<p>To independently listen to digital audio. (N)</p> <p>Take photographs using a digital device. (N/R)</p> <p>To record video using a digital device. (R)</p> <p>To record audio. (R)</p>	<p>Use technology purposefully to create digital content</p> <p>Select and use a range of tools</p> <p>Compare digital and paper-based content</p> <p><b>Suggested TC unit – Digital writing</b></p>	<p>Use technology purposefully to create digital content</p> <p>Produce digital content to meet a brief</p> <p>Edit and improve own pieces</p> <p><b>Suggested TC unit – Making music</b></p>	<p>Select, use and combine a variety of software on a range of devices</p> <p>Understand how to create and edit content using IT</p> <p>Use editing tools such as copy and paste to create content.</p> <p>Evaluate work produced</p> <p><b>Suggested TC unit – Stop – Frame Animation</b></p>	<p>Select, use and combine a variety of software on a range of devices</p> <p>Understand how to create and edit content using IT</p> <p>Use editing tools such to create content.</p> <p>Understand what input and output devices are.</p> <p>Evaluate work produced</p> <p><b>Suggested TC unit – Audio production</b></p>	<p>Understand what makes digital content effective.</p> <p>Create digital content for a specific purpose</p> <p>Improve and edit work produced</p> <p><b>Suggested TC unit – Introduction to vector graphics</b></p>	<p>Understand that web pages are written in HTML.</p> <p>Plan a web page design.</p> <p>Create a web page using software.</p> <p>Use navigation paths and consider effective links.</p> <p>Improve and edit work produced</p> <p><b>Suggested TC unit – Web page creation</b></p>

		EYFS	Y1	Y2	Y3	Y4	Y5	Y6
DIGITAL LITERACY	Operating devices	Knows how to access information on a device eg: open an app, open a link, use a QR code	Uses digital technology to find information  Knows not to share personal information online	Navigates the web to complete simple searches  Knows what personal information is and why to keep it private  Can say who they would go to for help if they were worried by something they saw online  Can choose appropriate websites and avoid sites/pop ups that are not appropriate or accurate	Searches for information on the web in different ways  Know how to access help if they are concerned about anything on social media or the internet  Knows how to use technology safely, respectfully and responsibly  Understands why passwords are used online and how to use them responsibly	Understands that not all information on the WWW is accurate.  Understand how to protect their identity online and how to report any concerns  Knows what to do if they see inappropriate content or they are contacted by someone they do not know online  Understands what cyberbullying is and know how to be a member of a respectful and positive online community	Understands how search results are selected and ranked  Know that there are rights and responsibilities in an online community or social network  Know that there are rights and responsibilities when playing a game online  Know that too much screen time isn't healthy  Know how to stay safe when using technology to communicate with friends  Knows what to do if they see inappropriate content (including pop ups) or am contacted by someone I do not know online  Understands the importance of online security and how to create a secure password	Be able to carry out specific searches on the WWW.  Understand how search engines work.  Know some of the dangers of being 'online'  Know how to use technology safely and positively to communicate with their friends and family  Knows how to protect private information online  Understands how to be respectful and responsible online as well as offline
	Searching and selecting information	Knows to ask an adult if they want to go online						
	Using devices safely and responsibly							

## Second Order Concepts

Second order concepts are fundamental knowledge and skills which are transferable across a range of curriculum subjects. For example, we introduce pupils to the concept of ‘similarity and difference’ early in their education, developing the observational skills and language needed to make comparisons. This is developed and applied as pupils move through the school so they can confidently apply this in all areas of the curriculum by upper Key Stage Two. A summary of second order concepts and how these apply to Computing is provided below.

Curriculum subject	Significance	Similarity and difference	Cause and consequence	Continuity and change	Responsibility	Communication (Oracy & Written)	Enquiry
<b>Computing</b>	Significant inventions and figures from the world of computing	Making comparisons, finding patterns, noticing differences, drawing conclusions	Inputs and outputs, programming	Changes in technology over time, future technology	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying, cyber security, passwords	Using correct terminology, coding language, programming, using technology to communicate and present information	