

# Bricknell Primary School

## Computing Curriculum Overview



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CONSTELLATION  
TRUST



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# The Curriculum – our approach

Bricknell Primary School’s curriculum has been developed over a period of 36 months. Much thought has gone into the research foundations for how children learn, the implication of subject specific best practice and the context of our school.

Through collaboration, rigours attention to detail and consultation with primary practitioners, trust leaders, secondary and Early Years teachers; the curriculum reflects a scheme of work that is intended to be sequenced form Early Years to Year 6 and enable pupils to be ready for the Key Stage 3 curriculum and world beyond education.

The curriculum design has a progressive approach at its core with a built in Aspiration Curriculum at the heart.



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## Intent:

The curriculum is built on the foundations of success. We believe all children should be aspirational, knowledgeable and should achieve their goals. This is the model our curriculum builds from

### Aspiration

- An Aspiration Curriculum at the heart of every lesson.
- Building life skills to succeed outside the world of education.
- Real life examples and experiences in local contexts and in the wider world.
- Working with local colleges and building links.
- Community outreach opportunities.

### Knowledge

- High quality teaching at the heart.
- Progressive curriculum mapping.
- Carefully timetabled broad and balanced curriculum.
- Carefully researched and implemented curriculum.
- Subject specific pedagogy.

### Achievement

- Ambitious curriculum outcomes.
- Assessability for all.
- Identification and facilitation of pupil's passions and love for a subject.
- Achievement beyond the classroom and into further education demonstrating a love for learning.
- Extensive extra-curricular offer.



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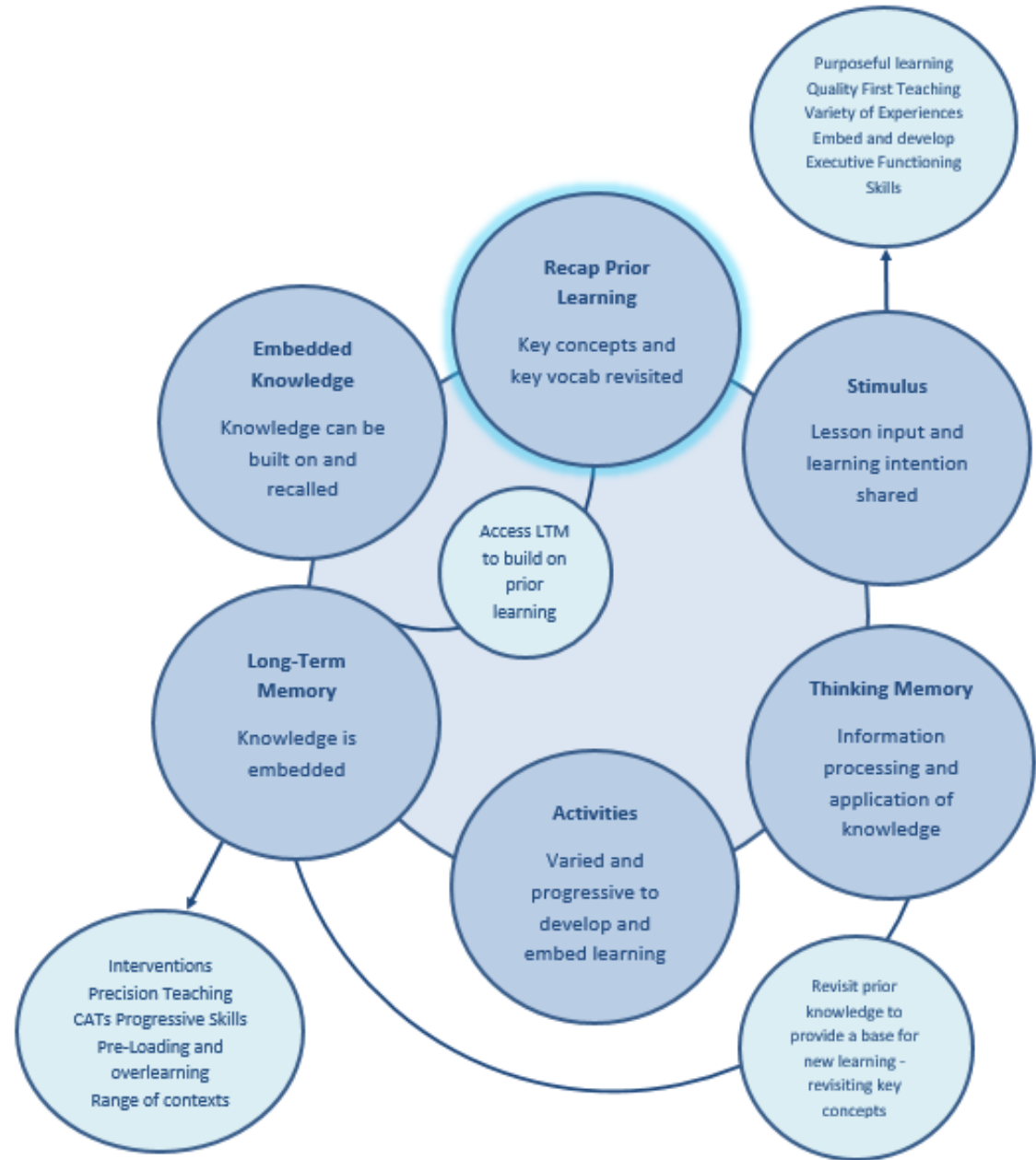
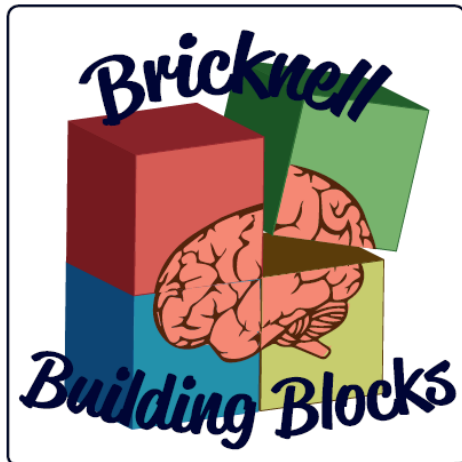
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## Bricknell's Working Memory Model

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.

At the core of our model is the retrieval of prior knowledge. Therefore, all lessons at Bricknell Primary School start with Bricknell's Building Blocks; the foundations to learning.



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## A Broad and Balanced Curriculum

Hours per day	4.25
Hours per week	21.25
Hours per year	828.75

Curriculum area	Hours per year	Total hours
<b>English</b>		
<b>Reading</b>	<b>78</b>	195
<b>Writing</b>	<b>117</b>	
<b>Maths</b>		
<b>Maths</b>	<b>195</b>	195
<b>Computer Science</b>		
<b>Science</b>	<b>78</b>	117
Computing	39	
<b>Humanities</b>		
<b>RE</b>	<b>39</b>	75
History	18	
Geography	18	
<b>Creative</b>		
Art	18	54
Design Technology	18	
Music	18	
<b>Additional</b>		
<b>Physical Education</b>	<b>78</b>	156
<b>PSHE</b>	<b>39</b>	
<b>MFL</b>	<b>39</b>	

Additional timetabled hours		
Enterprise Week	10	20
Transition Week	10	

At Bricknell, we want to ensure that we celebrate the talents of all pupils and provide everyone with opportunities to shine. Therefore, we have calculated the number of teaching hours available and have ensured that all pupils receive a broad and balanced curriculum at Key Stage 2.

To prepare our pupils for the digital world beyond the classroom and to enable their communication skills, upskilling them across all areas of the curriculum, we have allocated 39 hours a year to the computing curriculum. This can be cross curricular across all subjects and does not need to be taught each week.

**Reading, Writing and Maths are taught daily.**  
**Science Physical Education, PSHE, RE and MFL are required to be taught weekly.**

**These are highlighted in blue**

History, Geography, Art, Design Technology and Music all have equal weighting with 18 hours a year broken down to 3 half-termly blocks.

Year 4 offer a wider opportunities musical programme to the children therefore music has an increased weighting of 39 hours and to compensate, computing has a reduced weighting of 18 hours

- Art and Design Technology will each have 3 half term blocks. These will be taught alternatively to support staff workload.
- Music will have 3 half-termly blocks which will be taught at the same time across the whole school.
- Computing, History and Geography can remain blocked (in line with MTP)
- In addition to the teaching hours, pupils at Bricknell Primary School also receive a minimum of 400 minutes (6 hours, 40 minutes) of Opal Play a week.



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## Key Concepts

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.

Below is a summary of the key concepts for Computing.

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



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## 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

### 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 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, ensuring pupils know how to **operate devices**, how to **search and select information**, and how to use digital devices **safely and responsibly**



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## Computing Key Concepts Year Group Mapping

	Autumn	Spring	Summer
EYFS <b>Understanding the World</b>	<p style="text-align: center;">In EYFS pupils are taught Computing through the strand <b>Understanding the World</b>. Throughout the year pupils will be taught:</p> <p><b>Computer Systems and Networks:</b> How to use a computer, mouse and keyboard. Understanding how a tablet is different to a computer. <b>Creating Media:</b> listen to digital audio, take photographs, videos and audio using a digital device. <b>Data and information:</b> group objects by type, discuss data and information and understand categories using labels and create tally charts. <b>Programming:</b> programme a floor robot to follow a set of simple instructions.</p>		
Year 1	<p><b>Computer Systems and Networks:</b> Information Technology Around Us</p> <p><b>Creating Media:</b> Digital Painting</p>	<p><b>Programming:</b> Floor Robots</p> <p><b>Data and information:</b> Grouping Data</p>	<p><b>Creating Media:</b> Digital Writing</p> <p><b>Programming:</b> Programming Animations</p>
Year 2	<p><b>Computer Systems and Networks:</b> Information Technology Around Us</p> <p><b>Creating Media:</b> Making music</p>	<p><b>Creating media:</b> Digital photography</p> <p><b>Programming:</b> Robot algorithms</p>	<p><b>Data and information:</b> Pictograms</p> <p><b>Programming:</b> Introduction to quizzes</p>
Year 3	<p><b>Computer Systems and Networks:</b> Connecting computers</p> <p><b>Programming:</b> Sequencing music</p>	<p><b>Creating Media:</b> Desktop publishing</p> <p><b>Data and information:</b> Branching data bases</p>	<p><b>Creating media:</b> Stop frame animation</p> <p><b>Programming:</b> Events and actions</p>
Year 4	<p><b>Computing Systems and Networks:</b> The internet</p>	<p><b>Programming:</b> Repetition in games</p>	<p><b>Creating media:</b> Audio editing</p>
Year 5	<p><b>Computer Systems and Networks:</b> Sharing information</p> <p><b>Programming:</b> Selection in quizzes</p>	<p><b>Creating media:</b> Vector drawing</p> <p><b>Creating media:</b> Video editing</p>	<p><b>Programming:</b> Selection in physical computing</p> <p><b>Data and information:</b> Data logging</p>
Year 6	<p><b>Computer Systems and Networks:</b> Communication</p> <p><b>Creating media:</b> 3d modelling</p>	<p><b>Programming:</b> Sensing</p> <p><b>Creating media:</b> Web page creation</p>	<p><b>Data and information:</b> Introduction to spreadsheets</p> <p><b>Programming:</b> Variables in games</p>




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# Knowledge and skills sequencing

## COMPUTING



	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
COMPUTER SCIENCE	<p><b>Programming</b></p>  <p>To program a floor robot to follow a simple set of instructions. (N).</p> <p>To complete a simple program on an electronic device to achieve a goal, (beebots). (R).</p>	<p><b>Floor Robots</b></p> <p>To explain what a given command will do.</p> <p>To act out a given word.</p> <p>To combine forwards and backwards commands to make a sequence.</p> <p>To combine four direction commands to make sequences.</p> <p>To plan a simple program.</p> <p>To find more than one solution to a problem.</p> <p><b>Programming Animations</b></p> <p>To choose a command for a given purpose.</p> <p>To show that a series of commands can be joined together.</p> <p>To identify the effect of changing a value.</p> <p>To explain that each sprite has its own instructions.</p> <p>To design the parts of a project.</p> <p>To use my algorithm to create a program.</p>	<p><b>Robot Algorithms</b></p> <p>To describe a series of instructions as a sequence.</p> <p>To explain what happens when we change the order of instructions.</p> <p>To use logical reasoning to predict the outcome of a program, (series of commands).</p> <p>To explain that programming projects can have code and artwork.</p> <p>To design an algorithm.</p> <p>To create and debug a program that I have written.</p> <p><b>An Introduction to Quizzes</b></p> <p>To explain that a sequence of commands has a start.</p> <p>To explain that a sequence of commands has an outcome.</p> <p>To create a program using a given design.</p> <p>To change a given design.</p> <p>To create a program using my own design.</p> <p>To decide how my project can be improved.</p>	<p><b>Sequence in Music</b></p> <p>To explore a new programming environment.</p> <p>To identify that commands have an outcome.</p> <p>To explain that a program has a start.</p> <p>To recognise that a sequence of commands can have an order.</p> <p>To change the appearance of my project.</p> <p>To create a project from a task description.</p> <p><b>Events and Actions</b></p> <p>To explain how a sprite moves in an existing project.</p> <p>To create a program to move a sprite in four directions.</p> <p>To adapt a program to a new context.</p> <p>To develop my program by adding features.</p> <p>To identify and fix bugs in a program.</p> <p>To design and create a maze based challenge.</p>	<p><b>Repetition in Games</b></p> <p>To develop the use of count controlled loops in a different programming environment.</p> <p>To explain that in programming there are infinite loops and count controlled loops.</p> <p>To develop a design which includes two or more loops which run at the same time.</p> <p>To modify an infinite loop in a given program.</p> <p>To design a project that includes repetition.</p> <p>To create a project that includes repetition.</p>	<p><b>Selection in Quizzes</b></p> <p>To explain how selection is used in computer programs.</p> <p>To relate that a conditional statement connects a condition to an outcome.</p> <p>To explain how selection directs the flow of a program.</p> <p>To design a program which uses selection.</p> <p>To create a program which uses selection.</p> <p>To evaluate my program.</p> <p><b>Selection in Physical Computing</b></p> <p>To control a simple circuit connected to a computer.</p> <p>To write a program that includes count controlled loops.</p> <p>To explain that a loop can stop when a condition is met, e.g. number of times.</p> <p>To conclude that a loop can be used to repeatedly check whether a condition has been met.</p> <p>To design a physical project that includes selection.</p> <p>To create a controllable system that includes selection.</p>	<p><b>Sensing</b></p> <p>To create a program to run on a controllable device.</p> <p>To explain that selection can control the flow of a program.</p> <p>To update a variable with a user input.</p> <p>To use a conditional statement to compare a variable to a value.</p> <p>To design a project that uses inputs and outputs on a controllable device.</p> <p>To develop a program to use inputs and outputs on a controllable device.</p> <p><b>Variables in Games</b></p> <p>To define a 'variable' as something that is changeable.</p> <p>To explain why a variable is used in a program.</p> <p>To choose how to improve a game by using variables.</p> <p>To design a project that builds on a given example.</p> <p>To use my design to create a project.</p> <p>To evaluate my project.</p>





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		EYFS	Y1	Y2	Y3	Y4	Y5	Y6
COMPUTER SCIENCE	<b>Data and information</b> 	<p>To group objects by type. (N).</p> <p>To discuss data and information and understand that things can be categorised using labels. (R).</p> <p>To create tally charts. (R).</p>	<p><b>Grouping Data</b> To label objects.</p> <p>To identify that objects can be counted.</p> <p>To describe objects in different ways.</p> <p>To count objects with the same properties.</p> <p>To compare groups of objects.</p> <p>To answer questions about groups of objects.</p>	<p><b>Pictograms</b> To recognise that we can count and compare objects using tally charts.</p> <p>To recognise that objects can be represented as pictures.</p> <p>To create a pictogram.</p> <p>To select objects by attribute and make comparisons.</p> <p>To recognise that people can be described by attributes.</p> <p>To explain that we can present information using a computer.</p>	<p><b>Branching Databases</b> To create questions with yes/no answers.</p> <p>To identify the object attributes needed to collect relevant data.</p> <p>To create a branching database.</p> <p>To explain why it is helpful for a database to be well structured.</p> <p>To identify objects using a branching database.</p> <p>To compare the information shown in a pictogram with a branching database.</p>		<p><b>Data Logging</b> To explain that data gathered over time can be used to answer questions.</p> <p>To use a digital device to collect data automatically.</p> <p>To explain that a data logger collects 'data points' from sensors over time.</p> <p>To use data collected over a long duration to find information.</p> <p>To identify the data needed to answer questions.</p> <p>To use collected data to answer questions.</p>	<p><b>Introduction to Spreadsheets</b> To identify questions which can be answered using data.</p> <p>To explain that objects can be described using data.</p> <p>To explain that formula can be used to produce calculated data.</p> <p>To apply formulas to data, including duplicating.</p> <p>To create a spreadsheet to plan an event.</p> <p>To choose suitable ways to present data.</p>
	<b>Computer systems and networks</b> 	<p>To know that a computer has a mouse and a keyboard 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><b>Technology Around Us</b> To identify technology.</p> <p>To identify a computer and its main parts.</p> <p>To use a mouse in different ways.</p> <p>To use a keyboard to type.</p> <p>To use the keyboard to edit text.</p> <p>To create rules for using technology responsibly.</p>	<p><b>IT Around Us</b> To recognise the uses and features of information technology.</p> <p>To identify information technology in the home.</p> <p>To identify information technology beyond school.</p> <p>To explain how information technology benefits us.</p> <p>To show how to use information technology safely.</p> <p>To recognise that choices are made when using information technology.</p>	<p><b>Connecting Computers</b> To explain how digital devices function.</p> <p>To identify input and output devices.</p> <p>To recognise how digital devices can change the way we work.</p> <p>To explain how a computer network can be used to share information.</p> <p>To explore how digital devices can be connected.</p> <p>To recognise the physical components of a network.</p>	<p><b>The Internet</b> To describe how networks physically connect to other networks.</p> <p>To recognise how networked devices make up the internet.</p> <p>To outline how websites can be shared via the World Wide Web (WWW).</p> <p>To describe how content can be added and accessed on the World Wide Web (WWW).</p> <p>To recognise how the content of the WWW is created by people.</p> <p>To evaluate the consequences of unreliable content.</p>	<p><b>Sharing information</b> To explain that computers can be connected together to form systems.</p> <p>To recognise the role of computer systems in our lives.</p> <p>To recognise how information is transferred over the internet.</p> <p>To explain how sharing information online lets people in different places work together.</p> <p>To contribute to a shared project online.</p> <p>To evaluate different ways of working together online.</p>	<p><b>Communication</b> To identify how to use a search engine.</p> <p>To describe how search engines select results.</p> <p>To explain how search results are ranked.</p> <p>To recognise why the order of results is important, and to whom.</p> <p>To recognise how we communicate using technology.</p> <p>To evaluate different methods of online communication.</p>

		EYFS	Y1	Y2	Y3	Y4	Y5	Y6
INFORMATION TECHNOLOGY	<b>Creating media</b> 	<p>To independently listen to digital audio. (N).</p> <p>To 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><b>Digital Painting</b> To describe what different freehand tools do.</p> <p>To use the shape tool and the line tools.</p> <p>To make careful choices when painting a digital picture.</p> <p>To explain why I chose the tools I used.</p> <p>To use a computer on my own to paint a picture.</p> <p>To compare painting a picture on a computer and on paper.</p> <p><b>Digital Writing</b> To use a computer to write.</p> <p>To add and remove text on a computer.</p> <p>To identify that the look of text can be changed on a computer.</p> <p>To make careful choices when changing text.</p> <p>To explain why I used the tools that I chose.</p> <p>To compare writing on a computer with writing on paper.</p>	<p><b>Making Music</b> To say how music can make us feel.</p> <p>To identify that there are patterns in music.</p> <p>To describe how music can be used in different ways.</p> <p>To show how music is made from a series of notes.</p> <p>To create music for a purpose.</p> <p>To review and refine our computer work.</p> <p><b>Digital Photography</b> To use a digital device to take a photograph.</p> <p>To make choices when taking a photograph.</p> <p>To describe what makes a good photograph. To decide how photographs can be improved.</p> <p>To use tools to change an image.</p> <p>To recognise that images can be changed.</p>	<p><b>Desktop Publishing</b> To recognise how text and images convey information.</p> <p>To recognise that text and layout can be edited.</p> <p>To choose appropriate page settings.</p> <p>To add content to a desktop publishing publication.</p> <p>To consider how different layouts can suit different purposes.</p> <p>To consider the benefits of desktop publishing.</p> <p><b>Stop-Frame Animation</b> To explain that animation is a sequence of drawings or photographs.</p> <p>To relate animated movement with a sequence of images.</p> <p>To plan an animation.</p> <p>To identify the need to work consistently and carefully.</p> <p>To review and improve an animation.</p> <p>To evaluate the impact of adding other media to an animation.</p>	<p><b>Audio Editing</b> To identify that sound can be digitally recorded.</p> <p>To use a digital device to record sound.</p> <p>To explain that a digital recording is stored as a file.</p> <p>To explain that audio can be changed through editing.</p> <p>To show that different types of audio can be combined and played together.</p> <p>To evaluate editing choices made.</p>	<p><b>Vector Drawing</b> To identify that drawing tools can be used to produce different outcomes.</p> <p>To create a vector drawing by combining shapes.</p> <p>To use tools to achieve a desired effect.</p> <p>To recognise that vector drawings consist of layers.</p> <p>To group objects to make them easier to work with.</p> <p>To evaluate my vector drawing.</p> <p><b>Video Editing</b> To explain what makes a video effective.</p> <p>To identify digital devices that can record video.</p> <p>To capture video using a range of techniques.</p> <p>To create a storyboard</p> <p>To identify that video can be improved through reshooting and editing.</p> <p>To consider the impact of the choices made when making and sharing a video.</p>	<p><b>3D Modelling</b> To use a computer to create and manipulate three dimensional (3D) digital objects.</p> <p>To compare working digitally with 2D and 3D graphics.</p> <p>To construct a digital 3D model of a physical object.</p> <p>To identify that physical objects can be broken down into a collection of 3D shapes.</p> <p>To design a digital model by combining 3D objects.</p> <p>To develop and improve a digital 3D model.</p> <p><b>Web Page Creation</b> To review an existing website and consider its structure. To plan the features of a web page.</p> <p>To consider the ownership and use of images, (copyright).</p> <p>To recognise the need to preview pages.</p> <p>To outline the need for a navigation path.</p> <p>To recognise the implications of linking to content owned by other people.</p>

		EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
DIGITAL LITERACY	Digital Literacy	<p>Knows how to access information on a device eg: open an app, open a link, use a QR code</p> <p>Knows to ask an adult if they want to go online</p>	<p>Uses digital technology to find information</p> <p>Knows not to share personal information online</p>	<p>Navigates the web to complete simple searches</p> <p>Knows what personal information is and why to keep it private</p> <p>Can say who they would go to for help if they were worried by something they saw online</p> <p>Can choose appropriate websites and avoid sites/pop ups that are not appropriate or accurate</p>	<p>Searches for information on the web in different ways</p> <p>Know how to access help if they are concerned about anything on social media or the internet</p> <p>Knows how to use technology safely, respectfully and responsibly</p> <p>Understands why passwords are used online and how to use them responsibly</p>	<p>Understands that not all information on the WWW is accurate.</p> <p>Understand how to protect their identity online and how to report any concerns</p> <p>Knows what to do if they see inappropriate content or they are contacted by someone they do not know online</p> <p>Understands what cyberbullying is and know how to be a member of a respectful and positive online community</p>	<p>Understands how search results are selected and ranked</p> <p>Know that there are rights and responsibilities in an online community or social network</p> <p>Know that there are rights and responsibilities when playing a game online</p> <p>Know that too much screen time isn't healthy</p> <p>Know how to stay safe when using technology to communicate with friends</p> <p>Knows what to do if they see inappropriate content (including pop ups) or am contacted by someone I do not know online</p> <p>Understands the importance of online security and how to create a secure password</p>	<p>Be able to carry out specific searches on the WWW.</p> <p>Understand how search engines work.</p> <p>Know some of the dangers of being 'online'</p> <p>Know how to use technology safely and positively to communicate with their friends and family</p> <p>I know how to protect private information when I am online</p> <p>I understand how to be respectful and responsible online as well as offline</p>
								



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## 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 the second order concepts and how they apply to Computing are provided in the table 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	



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