



# Lovers' Lane Primary and Nursery School



## Computing National Curriculum

### **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.

### **Key Stage 1**

Children understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following a sequence of instructions. They write and test simple programs. Children learn to organise, store, manipulate and retrieve data in a range of digital formats. They learn how to communicate safely and respectfully online, keeping personal information private, along with recognising common uses of information technology beyond school.

### **Pupils should be taught about:**

#### **Computer Science:**

By the time children leave Year 2, children can explain that an algorithm is a set of instructions to complete a task. When designing simple programs, children show an awareness of the need to be precise with their algorithms so that they can be successfully converted into code. Children can create a simple program that achieves a specific purpose. They can also identify and correct some errors, e.g. Debug Challenges: Chimp. Children's program designs display a growing awareness of the need for logical, programmable steps. Children can identify the parts of a program that respond to specific events and initiate specific actions. For example, they can write a cause and effect sentence of what will happen in a program.

#### **Information Technology:**

By the time children leave Year 2, they demonstrate an ability to organise data using, for example, a database such as 2Investigate and can retrieve specific data for conducting simple searches. Children are able to edit more complex digital data such as music compositions within 2Sequence. Children are confident when creating, naming, saving and retrieving content. Children use a range of media in their digital content including photos, text and sound.

#### **Digital Literacy:**

By the time children leave Year 2, they can effectively retrieve relevant, purposeful digital content using a search engine. They can apply their learning of effective searching beyond the classroom. They can share this knowledge, e.g. 2Publish example template. Children make links between technology they see around them, coding and multimedia work they do in school e.g. animations, interactive code and programs. Children know the implications of inappropriate online searches. Children begin to understand how things are shared electronically such as posting work to the Purple Mash display board. They develop an

**Show Respect, Work Together, Aspire, Nurture**



# Lovers' Lane Primary and Nursery School



understanding of using email safely by using 2Respond activities on Purple Mash and know ways of reporting inappropriate behaviours and content to a trusted adult.

## **Computing National Curriculum Key stage 2**

Children design and write programs that accomplish specific goals, including controlling or simulating physical systems; solving problems by decomposing them into smaller parts. Children describe how internet search engines find and store data; they use search engines effectively; are discerning in evaluating digital content; respectful of individuals and intellectual property; use technology responsibly, securely and safely. Children use sequence, selection and repetition in programs; work with variables and various forms of input and output; generate appropriate inputs and predicted outputs to test programs. They use logical reasoning to explain how a simple algorithm works and to detect and correct errors in algorithms and programs. They understand computer networks including the internet; how they can provide multiple services, such as the worldwide web; and the opportunities they offer for communication and collaboration. Children in Key Stage 2 select, use and combine a variety of software (including internet services) on a range of digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

### **Computer Science:**

By the end of Year 6, children are able to turn a more complex programming task into an algorithm by identifying the important aspects of the task (abstraction) and then decomposing them in a logical way using their knowledge of possible coding structures and applying skills from previous programs. Children test and debug their program as they go and use logical methods to identify the cause of bugs, demonstrating a systematic approach to try to identify a particular line of code causing a problem. Children translate algorithms that include sequence, selection and repetition into code and their own designs show that they are thinking of how to accomplish the set task in code utilising such structures, including nesting structures within each other. Coding displays an improving understanding of variables in coding, outputs such as sound and movement, inputs from the user of the program such as button clicks and the value of functions. Children are able to interpret a program in parts and can make logical attempts to put the separate parts of a complex algorithm together to explain the program as a whole. Children understand and can explain in some depth the difference between the internet and the World Wide Web. Children know what a WAN and LAN are and can describe how they access the internet in school.

### **Information Technology:**

By the end of Year 6, children are able to interpret a program in parts and can make logical attempts to put the separate parts of a complex algorithm together to explain the program as a whole. Children make clear connections to the audience when designing and creating digital content. The children design and create their own blogs to become a content creator on the internet, e.g. 2Blog. They are able to use criteria to evaluate the quality of digital solutions and are able to identify improvements, making some refinements.

### **Digital Literacy:**

By the end of Year 6, children demonstrate the safe and respectful use of a range of different technologies and online services. They identify more discreet inappropriate behaviours through developing critical thinking, e.g. 2Respond activities. They recognise the value in preserving their privacy when online for their own and other people's safety.

To meet the aim of delivering this comprehensive set of substantive and disciplinary concepts, the Purple Mash scheme is followed. These resources and foci may be adapted to suit the school and individual cohorts as well as to match the available software and hardware.

**Show Respect, Work Together, Aspire, Nurture**



# Lovers' Lane Primary and Nursery School



## Disciplinary knowledge

Disciplinary knowledge in computing is the use and interpretation of substantive knowledge in order to develop original digital content and programs.

## Substantive knowledge

Substantive knowledge in computing is understanding how to use technology, how to be safe and knowing how to program. This is developed through providing appropriate scaffolding, deliberate practice and by children applying their knowledge of how to be computational thinkers so that they know more, remember more and do more.

“Computational thinking is an important life skill, which all pupils now need to develop. It is central to both living in and understanding our digitally enriched world. It is a cognitive process involving logical reasoning by which problems are solved across the whole curriculum and through life in general.” (Computing at School, 2015)

Computing Learning Progression							
Key Area	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Algorithms and Programs</b>		<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>• create a simple series of instructions - left and right</li> <li>• record their routes understand forwards, backwards, up and down</li> <li>• put two instructions together to control a programmable toy</li> <li>• begin to plan and test a Bee-bot journey</li> </ul>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>• predict the outcomes of a set of instructions</li> <li>• use right angle turns</li> <li>• use the repeat commands</li> <li>• test and amend a set of instructions</li> <li>• write a simple program and test it</li> <li>• predict what the outcome of a simple program will be</li> </ul>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>• experiment with variables to control models</li> <li>• use 90 degree and 45 degree turns</li> <li>• give an on-screen robot directional instruction</li> <li>• draw a square, rectangle and other regular shapes on screen, using commands</li> <li>• write more complex programs</li> </ul> <p><b>Challenge</b> use repeat command in logo to create a pattern</p>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>• use repeat instructions to draw regular shapes on screen, using commands</li> <li>• experiment with variables to control models</li> <li>• make turns specifying the degrees</li> <li>• give an on-screen robot specific directional instruction that takes them from x to y</li> <li>• make accurate predictions about the outcome of a program they have written</li> </ul>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>• combine sequences of instructions and procedures to turn devices on or off</li> <li>• understand input and output</li> <li>• use an ICT program to control an external device that is electrical and/or mechanical</li> <li>• use ICT to measure sound or light or temperate using sensors</li> <li>• explore 'What is' questions by playing adventure or quest games</li> <li>• write programs that have sequences and repetitions</li> </ul>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>• explain how an algorithm works</li> <li>• detect errors in a program and correct them</li> <li>• use an ICT program to control a number of events for an external device</li> <li>• use ICT to measure sound, light or temperature using sensors and interpret the data</li> <li>• explore 'what if' questions by planning different scenarios for controlled devices</li> <li>• use input from sensors to trigger events</li> <li>• check and refine a series of instructions</li> </ul>

Show Respect, Work Together, Aspire, Nurture



# Lovers' Lane Primary and Nursery School



## Computing Learning Progression

Key Area	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Data Retrieving and Organising</b>		<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>capture images with a camera</li> <li>print out a photograph from a camera with help</li> <li>record a sound and play it back</li> <li>enter information into a template to make a graph</li> <li>talk about the results shown on a graph</li> </ul> <p><b>Challenge</b> record pupils' voices as a voiceover</p> <p>use a teacher prepared photo story to create a slideshow of photos</p>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>find information on a website</li> <li>click links in a website</li> <li>print a web page to use as a resource</li> <li>experiment with text, pictures and animation to make a simple slide show</li> <li>use the shape tools to draw</li> </ul>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>review images on a camera and delete unwanted images</li> </ul> <p>Have they experienced downloading images from a camera into files on the computer</p> <ul style="list-style-type: none"> <li>use photo editing software to crop photos and add effects</li> <li>manipulate sound when using simple recording story boarding</li> </ul>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>capture images using webcams, screen capture, scanning, visualiser and internet</li> <li>choose images and download into a file</li> <li>download images from the camera into files on the computer</li> <li>copy graphics from a range of sources and paste into a desktop publishing program</li> </ul>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>listen to streaming audio such as online radio</li> <li>download and listen to podcasts</li> <li>produce and upload a podcast</li> <li>manipulate sounds using Audacity</li> <li>select music from open sources and incorporate it into multimedia presentations</li> <li>work on simple film editing</li> </ul>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>explore the menu options and experiment with images (colour effects, options, snap to grid, grid settings etc.)</li> <li>add special effects to alter the appearance of a graphic</li> <li>'save as' gif or i peg. wherever possible to make the file size smaller (for emailing or downloading)</li> <li>make an information poster using their graphics skills to good effect</li> </ul>



# Lovers' Lane Primary and Nursery School



## Computing Learning Progression

Key Area	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Communicating</b>		<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>recognise what an email address looks like</li> <li>Have they joined in sending a class email</li> <li>use the @ key and type an email address</li> <li>word process ideas using a keyboard</li> <li>use the spacebar, back space, enter, shift and arrow keys</li> <li>print out a page from the internet</li> </ul>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>send and reply to messages sent by a safe email partner (within school)</li> <li>word process a piece of text</li> <li>insert/delete a word using the mouse and arrow keys</li> <li>highlight text to change its format (B, U, I)</li> </ul> <p><b>Challenge</b> create a presentation in a small group and record the narration</p> <p>record sounds into software and playback</p> <p>insert pre recorded sounds into a presentation</p> <p>capture still and moving images</p>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>use the email address book</li> <li>open and send an attachment</li> </ul> <p><b>Challenge</b> contribute to a class blog</p>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>appreciate the benefits of ICT to send messages and to communicate</li> <li>use the automatic spell checker to edit spellings</li> </ul>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>use instant messaging to communicate with class members</li> <li>conduct a video chat with someone elsewhere</li> </ul>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>conduct a video chat with people in another country or organisation</li> </ul> <p><b>Challenge</b> conduct a video chat with more than one person at a time</p>



# Lovers' Lane Primary and Nursery School



## Computing Learning Progression

Key Area	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b><u>Using the internet</u></b>	N/A	N/A	N/A	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>• find relevant information by browsing a menu.</li> <li>• search for an image, then copy and paste it into a document</li> <li>• use 'Save picture as' to save an image to the computer</li> <li>• copy and paste text into a document</li> <li>• begin to use note making skills to decide what text to copy</li> </ul> <p><b><u>Challenge</u></b> use animation in their presentation</p> <p>bookmark a page into your favourites</p>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>• use a search engine to find a specific website</li> <li>• use note-taking skills to decide which text to copy and paste into a document</li> <li>• use tabbed browsing to open two or more web pages at the same time</li> <li>• open a link to a new window</li> <li>• open a document (PDF) and view it</li> </ul>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>• use a search engine using keyword searches</li> <li>• compare the results of different searches</li> <li>• decide which sections are appropriate to copy and paste from at least two web pages</li> <li>• save stored information following simple lines of enquiry</li> <li>• download a document and save it to the computer</li> </ul> <p><b><u>Challenge</u></b> save an image document as a gif or ipeg file format using the 'save as' command</p>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>• contribute to discussions online</li> <li>• use a search engine using keyword searches</li> <li>• use complex searches using such as '+' 'OR' "Find the phrase in inverted commas"</li> </ul> <p><b><u>Challenge</u></b> compare the information provided on two tabbed websites looking for bias and perspective</p>



# Lovers' Lane Primary and Nursery School



## Computing Learning Progression

Key Area	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b><u>Databases</u></b>	N/A	N/A	N/A	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>input data into a prepared database</li> <li>sort and search a database to answer simple questions</li> <li>use a branching database</li> </ul>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>input data into a prepared database</li> <li>sort and search a database to answer simple questions</li> <li>recognise what a spread sheet is</li> <li>use the terms 'cells', 'rows' and 'columns'</li> <li>enter data, highlight it and make bar charts</li> </ul> <p><b>Challenge</b> copy and paste the graph / bar chart and use it in a WP document</p>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>create a formula in a spreadsheet and then check for accuracy and plausibility</li> <li>search databases for information using symbols such as = &gt; or &lt;</li> <li>create databases planning the fields, rows and columns</li> <li>create graphs and tables to be copied and pasted into other documents</li> </ul>	<p>Most children will know how to:</p> <ul style="list-style-type: none"> <li>collect live data using data logging equipment</li> <li>identify data error, patterns and sequences</li> <li>use the formulae bar to explore mathematical scenarios</li> <li>create their own database and present information from it</li> </ul>





# Lovers' Lane Primary and Nursery School



## Computing Learning Progression

Key Area	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>E-Safety</b>	N/A	<p>Most children will know how to:</p> <p><b>Knowledge:</b></p> <ul style="list-style-type: none"> <li>understand the different methods of communication (e.g. email, online forums etc)</li> <li>know you should only open email from a known source</li> <li>know the difference between email and communication systems such as blogs and wikis</li> <li>know that websites sometimes include pop-ups that take them away from the main site</li> <li>know that bookmarking is a way to find safe sites again quickly</li> <li>begin to evaluate websites and know that everything on the internet is not true</li> <li>know that it is not always possible to copy some text and pictures from the internet</li> <li>know that personal information should not be shared online</li> <li>know they must tell a trusted adult immediately if anyone tries to meet them via the internet</li> </ul> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>follow the school's safer internet rules</li> <li>use the search engines agreed by the school</li> <li>act if they find something inappropriate online or something they are unsure of (including identifying people who can help; minimising screen; online reporting using school system etc)</li> <li>use the internet for learning and communicating with others, making choices when navigating through sites</li> <li>send and receive email as a class</li> <li>recognise advertising on websites and learn to ignore it</li> <li>use a password to access the secure network</li> </ul>	<p>Most children will know how to:</p> <p><b>Knowledge:</b></p> <ul style="list-style-type: none"> <li>understand the need for rules to keep them safe when exchanging learning and ideas online</li> <li>recognise that information on the internet may not be accurate or reliable and may be used for bias, manipulation or persuasion</li> <li>understand that the internet contains fact, fiction and opinion and begin to distinguish between them</li> <li>use strategies to verify information, e.g. cross-checking</li> <li>understand the need for caution when using an internet search for images and what to do if they find an unsuitable image</li> <li>understand that copyright exists on most digital images, video and recorded music</li> <li>understand the need to keep personal information and passwords private</li> <li>understand that if they make personal information available online it may be seen and used by others</li> <li>know how to respond if asked for personal information or feel unsafe about content of a message</li> <li>recognise that cyber bullying is unacceptable and will be sanctioned in line with the school's policy</li> <li>know how to report an incident of cyber bullying</li> <li>know the difference between online communication tools used in school and those used at home</li> <li>understand the need to develop an alias for some public online use</li> <li>understand that the outcome of internet searches at home may be different than at school</li> </ul> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>follow the school's safer internet rules</li> <li>recognise the difference between the work of others which has been copied (plagiarism) and re-structuring and re-presenting materials in ways which are unique and new</li> <li>begin to identify when emails should not be opened and when an attachment may not be safe</li> <li>explain how to use email safely</li> <li>use different search engines</li> </ul>	<p>Most children will know how to:</p> <p><b>Knowledge:</b></p> <ul style="list-style-type: none"> <li>discuss the positive and negative impact of the use of ICT in their own lives and those of their peers and family</li> <li>understand the potential risk of providing personal information online</li> <li>recognise why people may publish content that is not accurate and understand the need to be critical evaluators of content</li> <li>understand that some websites and/or pop-ups have commercial interests that may affect the way the information is presented</li> <li>recognise the potential risks of using internet communication tools and understand how to minimise those risks (including scams and phishing)</li> <li>understand that some material on the internet is copyrighted and may not be copied or downloaded</li> <li>understand that some messages may be malicious and know how to deal with this</li> <li>understand that online environments have security settings, which can be altered, to protect the user</li> <li>understand the benefits of developing a 'nickname' for online use</li> <li>understand that some malicious adults may use various techniques to make contact and elicit personal information</li> <li>know that it is unsafe to arrange to meet unknown people online</li> <li>know how to report any suspicions</li> <li>understand they should not publish other people's pictures or tag them on the internet without permission</li> <li>know that content put online is extremely difficult to remove</li> <li>know what to do if they discover something malicious or inappropriate</li> </ul> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>follow the school's safer internet rules</li> <li>make safe choices about use of technology</li> <li>use technology in ways which minimises risk, e.g. responsible use of online discussions, etc</li> <li>create strong passwords and manage them so that they remain strong</li> <li>independently, and with regard for e-safety, select and use appropriate communication tools to solve problems</li> </ul>			



# Lovers' Lane Primary and Nursery School



				<p>by collaborating and communicating with others within and beyond school</p> <ul style="list-style-type: none"> <li>• competently use the internet as a search tool</li> <li>• reference information sources</li> <li>• use appropriate strategies for finding, critically evaluating, validating and verifying information, e.g. using different keywords, skim reading to check relevance of information, cross checking with different websites or other non ICT resources</li> <li>• use knowledge of the meaning of different domain names and common website extensions (e.g. .co.uk; .com; .ac; .sch; .org; .gov; .net) to support validation of information</li> </ul>
--	--	--	--	--

## Lovers' Lane Primary School – Key Computing Concept Words

Computing		
algorithm	object	
animation	password	
binary	search	
coding	software	
cyber-bullying	testing	
data	variable	
debugging	website	
event		
execute		
hardware		
internet		
network		

Show Respect, Work Together, Aspire, Nurture