



## Computing at Lodge Farm

### Our vision for Computing

**Disclaimer:** At Lodge Farm, our computing curriculum is taught through the **Herts for Learning Computing Scheme** which has been created by the Herts for Learning Computing Curriculum Team and meets the requirements of the 2014 Computing Programmes of Study. The knowledge and skills below have been taken from the **2017-2018 Version 6**.

#### INTENT:

- To support a high level of digital literacy in children so that they are safe, competent and creative users of technology.
- To inspire children to become productive creators and designers of technology, by introducing the essential aspects of computer science.

*(Adapted from Herts for Learning Computing Scheme 2017-2018 Version 6)*

#### FINAL GOAL FOR THE END OF KS2:

- To use computational thinking and creativity to understand and change the world.
- To understand the principles of computer science through information and computing, how digital systems work, and how to put this knowledge to use through programming.
- To become digitally literate; be able to use, and express themselves and develop their ideas through information and communication technology.
- To be active participants in a digital world.

*(2014 Computing Curriculum: Purpose of Study)*

Year group	National Curriculum Reference	EOY Intended knowledge – WHAT WILL THE CHILDREN KNOW?	EOY Intended skills – WHAT WILL THE CHILDREN BE ABLE TO DO?
Year 1	1.i understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions	<b>Visual Information</b> 1.iii 1.iv 1.v 1.vi Children investigate how we derive information from different sources. They create graphs and charts and make general statements. They use data-loggers to explore environmental conditions. They organise objects using branching databases. They explore how computers might sort objects, noting the process of Repeat. They build eSafe practice.	<b>Visual Information EoU task</b> <ul style="list-style-type: none"> <li>➢ Use appropriate software to organise some existing data in a simple pictogram/chart. Use this to make some general statements about the data.</li> <li>➢ Use a branching database to identify specific objects.</li> <li>➢ Suggest a “better” alternative for one of the questions in the branching database.</li> </ul>
	1.ii create and debug simple programs	<b>Let’s Create</b> 1.iii 1.iv 1.v 1.vi Children begin to explore digital texts, using varied devices and software to create digital content. They investigate differences between input and output and hardware and software. They explore the idea of a network related to computers at home and school, logging on to their area with support. They use unplugged	<b>Let’s Create EoU task</b> Select digital resources from a limited range, and carry out the following tasks: <ul style="list-style-type: none"> <li>➢ create a picture linked to a curriculum theme (story, poem, rhyme, song explanation etc.)</li> <li>➢ create a simple sentence related to their picture</li> <li>➢ create a digital sound recording related to their picture</li> </ul>
	1.iii use logical reasoning to predict the behaviour of simple programs		



## Computing at Lodge Farm

	<p>1.iv use technology purposefully to create, organise, store, manipulate and retrieve digital content</p> <p>1.v recognise common uses of information technology beyond school</p> <p>1.vi use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.</p>	<p>computing approaches to explore the devices they use. They consider eSafe practice.</p> <p><b>Discovering Programming</b> 1.i 1.ii 1.iii 1.v 1.vi Children name the main external parts of a computer and explore how they work together. They explore programmable devices relating their understanding of inputs and outputs to natural and digital systems. They use unplugged approaches and simple onscreen and physical devices to develop understanding of algorithms and programming. They develop their own skills in open programming time.</p>	<p><b>Discovering Programming EoU task</b></p> <ul style="list-style-type: none"> <li>➤ Create a simple algorithm to achieve a specific objective or target.</li> <li>➤ Write a program to instruct a physical and/or onscreen device to achieve an objective or target (This could link to their algorithm produced above.)</li> <li>➤ Test, debug and refine the program and note how it has been improved and/or developed for accuracy or efficiency.</li> <li>➤ Predict and test the outcome of a program written by a peer. Suggest improvements to the program.</li> </ul>
<p><b>Year 2</b></p>	<p>1.i understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</p> <p>1.ii create and debug simple programs</p> <p>1.iii use logical reasoning to predict the behaviour of simple programs</p> <p>1.iv use technology purposefully to create, organise, store, manipulate and retrieve digital content</p>	<p><b>Getting Creative</b> 1.i 1.ii 1.iv 1.v 1.vi Children build understanding of digital texts. They use varied devices and software with increased precision to create digital content. They revisit differences between input and output and hardware and software. They develop understanding of networks related to computers at home and school, logging on to their areas. They build understanding of algorithms using unplugged approaches. They develop eSafe practice.</p> <p><b>Starting Research</b> 1.iv 1.v 1.vi Children develop understanding of researching using non-digital and digital sources, including the World Wide Web. They understand the need to check their research results. They present</p>	<p><b>Getting Creative EoU task</b></p> <ul style="list-style-type: none"> <li>➤ Create or capture digital images that can be used for a sequencing activity.</li> <li>➤ Create a simple algorithm to specify the process for a simple animation (which could be an image sequence).</li> <li>➤ Use the algorithm to create the simple animation (or sequence of images).</li> <li>➤ Use appropriate software to write a short description of their animation.</li> <li>➤ Comment on their completed task (saying what they liked and what they would change).</li> </ul> <p><b>Starting Research EoU task</b> As a class, compose questions on a certain topic or area of learning. Independently:</p>



## Computing at Lodge Farm

	<p>1.v recognise common uses of information technology beyond school</p> <p>1.vi use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.</p>	<p>their research. They use charts, graphs and mind maps. They begin to respect copyright and ownership and know who to talk to if they are worried.</p> <p><b>Messages and Virtual Worlds</b> 1.i 1.iii 1.iv 1.v 1.vi Children explore ways of sending messages using digital and non-digital systems. They investigate the history of messages. As a class, they send and receive emails and read and comment on blogs. They explore simple virtual worlds. They create algorithms linked to their simulations. They program onscreen characters. They develop eSafe practice understanding the need to keep personal information private.</p>	<ul style="list-style-type: none"> <li>➢ use suitable digital resource/s from a restricted range, employing different techniques to find the information.</li> <li>➢ use existing templates or simple software to organise the information they have found.</li> <li>➢ share with peers or others, explaining how they have organised what they have found.</li> </ul> <p><b>Messages and Virtual Worlds EoU task</b></p> <ul style="list-style-type: none"> <li>➢ From a limited collection, choose a simulation or simple game to explore.</li> <li>➢ Explain the effects of the choices or decisions they made in the simulation and how these choices affected what happened as the simulation or game progressed.</li> <li>➢ Use logical reasoning to predict how the simulation might develop further.</li> <li>➢ As a group, send or post an electronic recommendation about the simulation to someone in the school community.</li> </ul>
<p><b>Year 3</b></p>	<p>2.i design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</p> <p>2.ii use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p>	<p><b>Bringing Images to Life</b> 2.i 2.ii 2.iii 2.vi 2.vii Children develop understanding of digital images. They transform and edit images, respecting copyright and ownership. They explore stop animation creating their own versions. They produce programmed animations, using sequence, repeat and selection.</p>	<p><b>Bringing Images to Life EoU task</b></p> <ul style="list-style-type: none"> <li>➢ Plan and create an animation to convey an idea/message: this should include use of an algorithm and either an onscreen programming language or animation tool.</li> <li>➢ Create digital image/s to convey the same idea/message.</li> <li>➢ Compare both projects, considering how well each communicates the central idea/message.</li> </ul>



## Computing at Lodge Farm

	<p>2.iii use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p> <p>2.iv understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration</p> <p>2.v use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p>2.vi select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</p> <p>2.vii use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p><b>Developing Communication</b> 2.iv 2.vi 2.vii Children use online communication tools such as email and blogs to support collaborative learning, safely and respectfully. They begin to investigate the technology used in digital communication networks. They use simple sound editing software to record and manipulate sound clips.</p> <p><b>Keeping Informed</b> 2.i 2.ii 2.iii 2.vi 2.vii Children understand the difference between data and information. They use sensors, data-loggers and other tools as part of their investigations. They use branching and flat-file databases to enter, organise and search data, deriving information which they present in different forms.</p>	<p><b>Developing Communication</b></p> <ul style="list-style-type: none"> <li>➢ Create a sound project for a given audience/purpose.</li> <li>➢ Share their work via email, blog or other digital communication tool, if a safe platform is available.</li> <li>➢ Evaluate their completed task.</li> </ul> <p><b>Keeping Informed EoU task</b></p> <ul style="list-style-type: none"> <li>➢ Individually research and enter data into a database around a new theme/topic (this could include data gathered using sensors).</li> <li>➢ Use the database to answer their own and others' questions, presenting at least one of their answers as a graph.</li> <li>➢ Comment on the structure of the database and how it helped them to find answers to questions</li> </ul>
<p><b>Year 4</b></p>	<p>2.i design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</p> <p>2.ii use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p>	<p><b>Accuracy Counts</b> 2.iv 2.v 2.vi 2.vii Children discuss computer networks including the internet and the services it offers. They explore how search engines work and what influences results, evaluating search engines and using sources. They learn about the threat from computer viruses, develop understanding of intellectual property and relate this to their own content. They use spreadsheet software to create graphs and to explore number patterns.</p>	<p><b>Accuracy Counts EoU task</b></p> <ul style="list-style-type: none"> <li>➢ Carry out some research related to a curriculum topic, ideally designing their own research questions and identifying key words. The research should include numerical data.</li> <li>➢ Present the information they have found, including using a spreadsheet to produce appropriate supporting graphs.</li> <li>➢ Evaluate their work and consider how it could be improved further.</li> </ul>



## Computing at Lodge Farm

	2.iii	use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	<p><b>Authoring 2.v 2.vi 2.vii</b> Children investigate computing storage capacities and ways of saving data. They develop understanding of the school network and operating systems. They use varied resources to create digital content, creating and manipulating images and words. They select and use software to create non-linear content for specific audiences and objectives.</p>	<p><b>Authoring EoU task</b></p> <ul style="list-style-type: none"> <li>➢ Plan a non-linear multimedia text for a specific purpose. Choose an appropriate application and create the text.</li> <li>➢ Demonstrate an understanding of copyright and ownership.</li> <li>➢ Share their work with others and make improvements in the light of their discussions.</li> <li>➢ Evaluate their completed task and comment on their choice of application.</li> </ul>
	2.iv	understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration		
	2.v	use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	<p><b>Programming and Games 2.i 2.ii 2.iii 2.vi 2.vii</b> Children explore simulations, investigating the structure and exploring how they might be programmed. They begin to note that abstraction can simplify them. They decompose tasks, creating and debugging algorithms and understanding how algorithms support the programming process. They write, test, debug and refine programs to achieve specific objectives, using sequence, repetition and procedures. They explore selection in digital and natural systems.</p>	<p><b>Programming and Games EoU task</b></p> <ul style="list-style-type: none"> <li>➢ Design an algorithm for an onscreen programming task (for example a pattern or design), which includes repeat functions and ideally procedures.</li> <li>➢ Use an onscreen programming language to write the program.</li> <li>➢ Test, debug and refine their program considering how to improve its efficiency.</li> <li>➢ Predict the outcome of a program produced by another pupil.</li> <li>➢ Evaluate their completed task including noting where they used decomposition to support the design of the task</li> </ul>
	2.vi	select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information		
	2.vii	use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.		
<b>Year 5</b>	2.i	design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	<p><b>Data Matters 2.iii 2.iv 2.v 2.vi 2.vii</b> Children investigate the concept of “big data” and its use in the world. They review file types and protection. They explore binary form and develop understanding of computer networks. They search more efficiently and investigate their digital footprints (or ‘digital tattoos’), building safe and responsible use of online spaces. They create and search flat-file databases, developing accuracy and efficiency.</p>	<p><b>Data Matters EoU task</b> Independently:</p> <ul style="list-style-type: none"> <li>➢ Produce a digital resource, selecting software and combining different digital content in an appropriate format to inform younger pupils about an aspect of the online world and encourage eSafe practice (for example effective searching, reducing digital footprints, using online spaces safely, “big data”, databases in the world etc.).</li> </ul>
	2.ii	use sequence, selection, and repetition in programs; work with variables and various forms of input and output		



## Computing at Lodge Farm

	2.iii	use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs		<ul style="list-style-type: none"> <li>➤ Present their resource, explaining how they ensured their own research practice was safe and appropriate. Evaluate.</li> </ul>
	2.iv	understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration	<p><b><u>Morphing Image</u></b> 2.vi 2.vii</p> <p>Children use 3D graphical modelling to create and explore objects. They review operating systems. They evaluate films and animations, going on to create live film or animations for specific audiences. They demonstrate their understanding of copyright and ownership.</p>	<p><b><u>Morphing Image EoU task</u></b></p> <ul style="list-style-type: none"> <li>➤ Choose to create a film, an animation or a 3D graphic to meet a specific need and audience.</li> <li>➤ Explain the stages of the creation of their work, detailing how these meet the audience/purpose.</li> <li>➤ Share their work and revisit it to refine and/or develop.</li> <li>➤ Evaluate the effectiveness of the final product and how it meets the given criteria.</li> </ul>
	2.v	use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content		
	2.vi	select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	<p><b><u>Robotics and Systems</u></b> 2.i 2.ii 2.iii 2.vi 2.vii</p> <p>Children investigate automated systems in the wider world and the use of sensors within them. They consider natural systems and use abstraction to represent them. They create, test, debug and refine algorithms, pseudocode and the related programs using sequence, selection, repetition and variables. They program physical devices, controlling inputs and outputs, relating to their study of automated systems.</p>	<p><b><u>Robotics and Systems EoU task</u></b></p> <ul style="list-style-type: none"> <li>➤ Use decomposition and algorithms / pseudocode to plan a program to control a physical/onscreen device which includes input sensors and output devices for a specific brief.</li> <li>➤ Include repetition and selection and use of variables in their program.</li> <li>➤ Add comments to their program to explain how it works.</li> <li>➤ Refine and modify their program, updating the comments to record the process and saving drafts.</li> <li>➤ Evaluate their program, considering efficiency and effectiveness.</li> </ul>
	2.vii	use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.		
<b>Year 6</b>	2.i	design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	<p><b><u>Staying Connected</u></b> 2.iv 2.v 2.vi 2.vii</p> <p>Children develop safe and appropriate use of online technologies, considering what they can use and what information is shared about them. They create blogs for school projects, checking and uploading digital content. They understand how a wiki works and the benefits of collaborative working. They know the school's eSafety rules and are proactive in encouraging other children to keep safe online.</p>	<p><b><u>Staying Connected EoU task</u></b></p> <p>Assuming you have access to a safe online platform:</p> <ul style="list-style-type: none"> <li>➤ As a class, identify a topic or focus for a class wiki, shared space or similar collaborative collection of documents.</li> <li>➤ Individually create a page for the class wiki, using an appropriate style, format and content for the target audience.</li> </ul>
	2.ii	use sequence, selection, and repetition in programs; work with variables and various forms of input and output		



## Computing at Lodge Farm

	<p>2.iii use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p> <p>2.iv understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration</p>		<ul style="list-style-type: none"> <li>➤ Explain the steps taken to ensure that contributions are accurate, unbiased, relevant and respectful of copyright.</li> </ul>
	<p>2.v use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p>2.vi select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</p>	<p><b>Information Models</b> 2.i 2.ii 2.vi 2.vii</p> <p>Children develop expertise in spreadsheets, using both formulae and functions. They import and analyse data collected on data-loggers. They use conditional formatting to vary the format of cells and create tools for specific user needs. They create models, identifying variables and using what-if modelling.</p>	<p><b>Information Models EoU task</b></p> <ul style="list-style-type: none"> <li>➤ Create a simple spreadsheet model to find possible answers to a real life problem.</li> <li>➤ Identify the variables within the model, explaining the effect of changing them.</li> <li>➤ Change the variables to provide a solution to the problem, presenting their answers in a report, using graphs as appropriate.</li> <li>➤ Explain how the model helped provide solutions to the problem, justifying their choices.</li> </ul>
	<p>2.vii use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p><b>Sounds Works</b> 2.vi 2.vii</p> <p>Children review how digital sound is used in the world and how it has developed over time. They create multi-track sound recordings for specific audiences, incorporating different content and demonstrating their understanding of the rules for copyright. They use programming languages to create their own sound clips.</p>	<p><b>Sounds Works</b></p> <ul style="list-style-type: none"> <li>➤ Plan and create a multi-track sound recordings using sound editing software to communicate an idea or mood appropriately and safely for a specific audience.</li> <li>➤ Upload / save the recording to a space that can be shared with others. (Upload to a safe online space if available.)</li> <li>➤ Demonstrate that they have respected ownership and copyright.</li> <li>➤ Share their work with others discussing the choices they made.</li> <li>➤ Review, refine and develop their work.</li> <li>➤ Evaluate their completed task, reflecting on their approach to the task and the resulting piece.</li> </ul>