Curriculum Learning Guide

Computing

How is Computing taught at Low Ash

Curriculum Intent

What do we want to achieve with our.....curriculum?

As part of their computing education at Low Ash, our pupils will use underlying ideas to survive and thrive in a world of rapid technological change. In order to make sound, well-informed judgements on issues concerning technology and more in society, our pupils need to explore and engage in a computing curriculum that gives them a broadly based level of technological understanding of the world. Across a huge and continuously growing range of professions, every child at our school will need to make some use of computing technology; if they understand how technology works then this will give them the tools they need to flourish in the future. Computer science is hugely empowering for individuals and for society in general and we want our pupils to feel empowered so that their lives can be changed for the better.

Our computing curriculum will turn our pupils from being "the slaves of technology into its masters...from mere consumers of technological stuff into its creators"

(Simon Peyton Jones, NCCE Chair).

Implementation

How will this be achieved?

Through the use of the 'Purple Mash' Scheme of Work from 2Simple- which is aligned with to the National Curriculum- our pupils will learn how to use technology effectively and with confidence. Use of this scheme allows us to establish a clear and consistent learning journey from Year 1 through to Year 6- ensuring that a high level of provision and continuity is achieved in the process.

Here at Low Ash, learning within computing is split into three main strands, as the National Curriculum: computer science, information technology and digital literacy. Online Safety is taught explicitly at various points through the computing curriculum. As part of the PSHE curriculum at Low Ash, pupils also receive further formal education and discreet guidance on how to stay safe in the online world.

Learning within the computer science strand allows our learning to study computation and computational thinking as well as the design and development of computer systems. With the information technology strand, our pupils continuously refine and develop their creative and productive use and application of computer systems and resources. Finally, within the digital literacy strand of computing, our pupils demonstrate their confident and effective use of computing systems, office applications and the internet.

As part of teaching and learning, the cross-curricular use of computing skills and of school technology as a whole allows our pupils to receive a broad and balanced curriculum which is enhanced by the effective integration and use of technology in our school. This takes place in a variety of contexts such as in History and Geography lessons through the effective use of iPad apps or in Maths lessons to support and enhance pupil engagement and learning.

In our early years setting and following the release of 'Development Matters: Non-statutory curriculum guidance for the early years foundation stage' from the DfE, we recognise that- despite the omission of computing from the early years curriculum- it is essential that our youngest learners are given a broad and engaging exposure to technology and aspects of the computing curriculum; as a result, early years pupils are given a broad range of opportunities to use and understand technology across a range of environments and contexts familiar to them.

In Key Stage 1, our pupils are taught the fundamental principles of computer science and information technology. They participate in weekly computing lessons which, for our youngest members, are taught in their classroom through the use of an iPad- this allows them to grow in confidence, learning how to log in and use passwords and credentials safely and securely before taking part in lessons based within our school ICT suite. Pupils are introduced to basic programming and learn how to create and debug simple programs using logical reasoning in the process. Learners use technology purposefully to create, organise, store, manipulate and retrieve digital content. Finally, pupils make links between uses of technology at school and at home.

In Key Stage 2, our pupils continue their learning journey by building on their understanding of computer science and information technology and this takes place weekly within their classrooms and the school ICT suite. Pupils continue to consolidate and enhance their understanding of programming and use acquired skills to design, write and debug programs that accomplish specific goals. Additionally, our pupils learn about computer networks such as the internet and consider how they facilitate collaboration and communication with others. Our pupils also learn to select, use and combine a variety of digital software on both desktop computers and iPads to create a range of content.

Online Safety is adopted and promoted throughout the school community in a variety of ways. Within the context of the computing curriculum, pupils in Key Stage 1 are introduced to Online Safety: they are taught about the importance of keeping private information, such as passwords, private and safe. Pupils begin to understand the implications of inappropriate online conduct and are taught ways of reporting inappropriate behaviour and content. In Key Stage 2, pupils build on their prior learning by understanding how to identify more discreet inappropriate behaviours.

In addition to being part of the Computing curriculum at Low Ash, Online Safety is discussed and taught in aspects of our PSHE curriculum under the theme of 'Keeping Safe and Managing Risk'. During these sessions, reference is made to a range of issues and concepts such as 'Netiquette', media distortion and the use of technology. This ensures that our pupils receive the best support and knowledge for the future lives in the online world.

Beyond the classroom setting, there are a number of ways in which we ensure that our pupils are safe in the online world. We celebrate staying safe online annually as part of 'Safer Internet Day'. We include online safety updates in termly editions of 'Low Ash News'. Finally, we ensure that there is continuous communication with parents on matters relating to online safety through use of our various social media platforms as well as informal communication via telephone and face-to-face interaction.

Impact
What will outcomes for learners be?

Following successful completion of the Low Ash computing curriculum, our pupils will:
- Have a broad range of skills and experience to tackle the digital world of today.
- Have high levels of digital literacy and digital resilience for the digital world of tomorrow.
- Have the knowledge and understanding necessary to allow them to use technology and the internet safely; knowing how to keep themselves and others safe in the online world.
- Achieve age-related expectations for computing, per National Curriculum requirements in England.

Overview

The aim of this progression document is to clearly outline how students at Low Ash will develop in the subject of computing throughout their time in school. This progression map follows the National Curriculum computing programmes of study for Key Stage 1 and 2 and has been split into three distinct strands*:

Computer Science	Information Technology	Digital Literacy
The study of computation and computational thinking as well as the design and development of computer systems.	The creative and productive use and application of computer systems- particularly in organisations.	The ability to use computer systems confidently and effectively including; keyboard and mouse skills; use of 'office applications'; the safe use of the internet.

Computing in the National Curriculum, NAACE

KS1		Computer Science			Information Technology	Digital Literacy	
Nursery	Statement	In our early years setting and following the release of 'Development Matters: Non-statutory curriculum guidance for the early years foundation stage' from the DfE, we recognise that- despite the omission of computing from the early years curriculum- it is essential that our youngest learners are given a broad and engaging exposure to technology and aspects of the computing curriculum; as a result, early years pupils are given a broad range of opportunities to use and understand technology in a range of environments and contexts familiar to them.					
	Outcome						
Reception	Statement						
	Outcome						
Year 1	Statement	Understand what algorithms are; how they are implemented as programs on digital devices and that programmes execute by following precise instructions.	Create and debug simple programs	Use logical reasoning to predict the behaviour of simple programs.	Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Recognise common uses of information technology beyond school.	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 online technologies.
	Outcome	Children understand that an algorithm is a set of instructions used to solve a problem or achieve an objective. They know that an algorithm written for a computer is a program.	Children can work out what is wrong with a simple algorithm when the steps are out of order. They can write their own simple algorithm. They can make logical attempts to fix	When looking at a program, children can read code one line at a time. They make good attempts to envision the bigger picture of the overall effect of the program i.e. what is the purpose of this program?	Children are able to sort, collate, edit and store simple digital content; They can name, save and retrieve their work and follow simple instructions to access resources.	Children understand what is meant by technology and can identify a variety of examples both in and out of school. They can make a distinction between objects that use modern technology and those that do not e.g. microwave vs a chair.	Children understand the importance of keeping information- such as their usernames and passwords- private and actively demonstrate this in lessons. Children save their work in their own private space.

					unexpected outcomes.			

Year 2	**Statement**	Understand what algorithms are; how they are implemented as programs on digital devices and that programmes execute by following precise instructions.	Create and debug simple programs	Use logical reasoning to predict the behaviour of simple programs.	Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Recognise common uses of information technology beyond school.	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 online technologies.
	Outcome	Children can explain that an algorithm is a set of instructions to complete a task.

Children understand that they need to be precise with their algorithms | Children can create a program that achieves a specific purpose.

They can identify and correct some errors.

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;

E.g. they can write a cause and effect sentence of what will happen in a program. | Children can organise data using a database.

They can retrieve specific data by conducting searches.

They are able to edit more complex digital data.

They can name, save and retrieve content.

They use a range of media in their digital content. | Children can effectively retrieve relevant, purposeful digital content using a search engine.

They can apply their learning of effective searching beyond the classroom

They make links between technology they see around them, coding and multimedia work they do in school. | Children know the implications of inappropriate online searches.

They begin to understand how things are shared electronically.

They develop an understanding of using email safely.

They know ways of reporting inappropriate behaviours and content. |

KS2	Computer Science	Information Technology	Digital Literacy

Year 3	Statement	Design, write and debug programs that accomplish specific goals. Solve problems by decomposing them into smaller parts.	Use sequence, selection and repetition in programs; work with variables and various forms of input and output.	Use logical reasoning to explain how some simple algorithms work. Detect and correct errors in algorithms and programs.	Understand computer networks including the internet; how they offer opportunities for collaboration and communication.	Use search technologies effectively and appreciate how results are selected and ranked.	Select, use and combine a variety of software on a range of digital devices to design and create a range of programs, systems and content.	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content and contact.
	Outcome	Children can turn a simple real-life situation into an algorithm for a program by breaking it down into manageable parts.

They can identify and error within their program that prevents it from working and then fix it. | Children design and code a program that follows a simple sequence.

They experiment with timers to achieve repetition.

Begin to understand how variables can be used. | Children's designs for their programs show new knowledge of coding structures;

Use of 'if' statements, variables and repetition.

They can 'read' programs with several steps and predict the outcome. | Children know a range of ways in which the internet can be used for communication

They can open, respond to and attach files to emails. | Children can carry out simple searches to retrieve digital content.

They know that, when they do this, they are connecting to the internet and using a search engine. | Children can collect, analyse, evaluate and present data and information using a selection of software.

They can use a branching database.

They can create purposeful content to attach to emails. | Children know the importance of having a secure password that shouldn't be shared with anyone.

Children can explain the negative consequences of not keeping passwords safe and secure.

They understand the importance of their conduct when using communication tools such as email. |

Year 4	**Statement**	Design, write and debug programs that accomplish specific goals. Solve problems by decomposing them into smaller parts.	Use sequence, selection and repetition in programs; work with variables and various forms of input and output.	Use logical reasoning to explain how some simple algorithms work. Detect and correct errors in algorithms and programs.	Understand computer networks including the internet; how they offer opportunities for collaboration and communication.	Use search technologies effectively and appreciate how results are selected and ranked.	Select, use and combine a variety of software on a range of digital devices to design and create a range of programs, systems and content.	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content and contact.
	Outcome	Children's designs show that they are thinking of how to accomplish this in code using coding structures for selection and repetition.

They make improved attempts to debug their own programs. | Children's use of timers to achieve repetition are becoming more logical.

Children are able to use and manipulate the value of variables when they are storing information. | They can trace code and use step-through methods to identify errors in code and make logical attempts to correct this. | Children recognise the main component parts of hardware which allow computers to join and form a network. | Children understand the function, features and layout of a search engine.

They can appraise selected webpages for credibility and information at a basic level. | Children are able to make improvements to digital solutions based on feedback.

Children make informed software choices when presenting information and data. | Children can explore key concepts relating to online safety using concept mapping.

They can help others to understand the importance of online safety.

Children know a range of ways of reporting inappropriate content and contact. |

Year 5	Statement	Design, write and debug programs that accomplish specific goals. Solve problems by decomposing them into smaller parts.	Use sequence, selection and repetition in programs; work with variables and various forms of input and output.	Use logical reasoning to explain how some simple algorithms work. Detect and correct errors in algorithms and programs.	Understand computer networks including the internet; how they offer opportunities for collaboration and communication.	Use search technologies effectively and appreciate how results are selected and ranked.	Select, use and combine a variety of software on a range of digital devices to design and create a range of programs, systems and content.	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content and contact.
	Outcome	Children attempt to create more complex algorithms for a program by breaking it down into manageable parts. They can identify the approximate cause of a bug but may need support when finding a specific line of code.	Children can translate algorithms that include sequence, selection and repetition into code with increasing ease. They are combining sequence, selection and repetition with other coding structures	When they code, the children are beginning to include structural and organisational elements to their coding such as tabs and naming of variables.	Children understand the value of computer networks but are also aware of the main dangers. Children can select the most appropriate form of online communication based on requirements e.g. email or Padlet.	Children search with greater complexity for digital content when using a search engine. They are able to explain in some detail how credible a webpage is and the information it contains.	Children are able to make appropriate improvements to digital solutions based on feedback received and can confidently comment on the success of the solution. Children are able to collaborate to create content and solutions using digital software.	Children have a secure knowledge of common online safety rules. Children implicitly relate appropriate online behaviour to their right to personal privacy and mental wellbeing of themselves and others.
Year 6	Statement	Design, write and debug programs	Use sequence, selection and	Use logical reasoning to	Understand computer	Use search technologies	Select, use and combine a variety	Use technology safely,

		that accomplish specific goals. Solve problems by decomposing them into smaller parts.	repetition in programs; work with variables and various forms of input and output.	explain how some simple algorithms work. Detect and correct errors in algorithms and programs.	networks including the internet; how they offer opportunities for collaboration and communication.	effectively and appreciate how results are selected and ranked.	of software on a range of digital devices to design and create a range of programs, systems and content.	respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content and contact.
	Outcome	Children can identify the important aspects of an algorithm (abstraction) and apply them to a new context using coding skills from previous programs . They can debug by looking at individual lines of code.	Children translate algorithms that include sequence, selection and repetition into code. They show an improved understanding of variables.	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. They know what a WAN and LAN are and can describe how they access the internet in school.	Children apply filters when searching for digital content. They can explain in detail how credible a webpage is and the information it contains. They compare a digital content sources and rate them in terms of content quality and accuracy.	Children make clear connections to the audience when designing and creating digital content. They design and create their own blogs to become a content creator on the internet They can evaluate digital content.	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. They recognise the value of preserving their privacy when online for everyone's sake.