Computing Scheme of Work & Skills and Knowledge

Progression Key Stage 1 and Key Stage 2

The INTENT of our Computing Curriculum

"Preparing our pupils for the digital world; unlocking the potential."

Computing Statement of Intent

Technology is changing the lives of everyone. Through teaching Computing we equip our children to participate in a rapidly changing world where work and leisure activities are increasingly transformed by technology. It is our intention to enable children to find, explore, analyse, exchange and present information. We also focus on developing the skills necessary for children to be able to use information in a discriminating and effective way. Computing skills are a major factor in enabling children to be confident, creative and independent learners and it is our intention that children have every opportunity available to allow them to achieve this.

Aims of Computing

The National Curriculum for computing and our progress of skills within each milestone aims to ensure that all pupils:

o Confident in using code and can understand and apply the fundamental principles and concepts of computer science, including logic, algorithms and data representation

o When coding, pupils can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems

o Effectively communicate and can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems

o Able to connect with others responsibly and are competent, confident and creative users of information and communication technology

Area	Key Stage 1 Aims	Key Stage 2 Aims
Computer Science (CS)	1. Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions 2. Create and debug simple programs 3. Use logical reasoning to predict the behaviour of simple programs	4. Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts 5. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output

		6. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs 7. Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web 8. Appreciate how [search] results are selected and ranked.
Information Technology (IT)	1. Use technology purposefully to create, organise, store, manipulate and retrieve digital content	2. Use search technologies effectively 3. 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
Digital Literacy (DL)	1. Recognise common uses of information technology beyond school 2. 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	3. Understand the opportunities [networks] offer for communication and collaboration 4. Be discerning in evaluating digital content 5. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns

		about content and contact.

Implementation: St Meryl School Computing Scheme of Work and Planning

We aim to have six dedicated Computing units per academic year, with a strong focus on e-safety, but computing will be used throughout all lessons. This is to allow more time for the application of Digital Literacy skills in other areas of the curriculum. Because there is now less content in the Computing curriculum, children should have more opportunities to use technology to support their learning in literacy, maths, and all the other areas of the school curriculum.

It is important to recognise however that some aspects of traditional ICT are still required to be taught discretely and should not be forgotten:

• in KS1, children should be taught to: "use technology purposefully to create, organise, store, manipulate and retrieve digital content";

• in KS2, children should be taught to: "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".

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
YEAR 1	Online Safety/ Exploring Purple Mash	Grouping and Sorting	Lego Builders	Animated Storybooks	Coding	Spreadsheets
		Pictograms	Maze Explorers			Technology Outside School

YEAR 2	Route Explorers	The Internet	Questioning	Effective Searching	Creating Pictures	Presenting Ideas

	Online Safety	Creating Pictures	Spreadsheets	Making Music	Coding	Making Music
YEAR 3	Touch Typing	Online Safety	Email	Coding	Branching Databases	Presenting
	Graphing	Spreadsheets	Branching Databases		Simulations	
YEAR 4	Effective Search	Coding	Spreadsheets	Writing for Different Audiences	Logo	Making Music
	Online Safety				Animation	Hardware Investigators
YEAR 5	Coding	Spreadsheets	Online Safety	Game Creator	3D Modelling	Using External Devices
			Databases	Concept Maps		

YEAR 6	Coding	Online Safety	Blogging	Text Adventures	Quizzing	Spreadsheets
		Spreadsheets	Networks	Databases		Understandng Binary

Key:

Computer Science	**Information Technology**	**Digital Literacy**

Computing Progression of Skills and Knowledge

YEAR 1			
	COMPUTER SCIENCE	**INFORMATION TECHNOLOGY**	**DIGITAL LITERACY**
Skills	-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 other online technologies.

Knowledge	-Children understand that an algorithm is a set of instructions used to solve a problem or achieve an objective. -Children know that a computer program turns an algorithm into code that the computer can understand. -Children can work out what is wrong with a simple algorithm when the steps are out of order. -Children know that an unexpected outcome is due to the code they have created and can make logical attempts to fix the code. -Children can read code one line at a time and make good attempts to envision the bigger picture of the overall effect of the program.	- Children are able to sort, collate, edit and store simple digital content.	-Children understand what is meant by technology and can identify a variety of examples both in and out of school. -Children understand the importance of keeping information, such as their usernames and passwords, private and actively demonstrate this in lessons. Children take ownership of their work and save this in their own private space such as their My Work folder on Purple Mash.
YEAR 2			
	COMPUTER SCIENCE	**INFORMATION TECHNOLOGY**	**DIGITAL LITERACY**

Skills	-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 other online technologies.
Knowledge	-Children can create a simple program that achieves a specific purpose. They can also identify and correct some errors -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.	-Children 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.	-Children can effectively retrieve relevant, purposeful digital content using a search engine. -Children 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. -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. – Children develop an understanding of using email safely -Children know ways of reporting inappropriate behaviours and content to a trusted adult.
YEAR 3			

	COMPUTER SCIENCE	INFORMATION TECHNOLOGY	DIGITAL LITERACY
Skills	-Design, write and debug programs that accomplish specific goals, -solve problems by decomposing them into smaller parts.	-Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	-Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour

	-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 and to detect and correct errors in algorithms and programs. -Understand computer networks, including the internet.	-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.	-Identify a range of ways to report concern about content and contact.

Knowledge	-Children can turn a simple real-life situation into an algorithm for a program by deconstructing it into manageable parts. -Children can identify an error within their program that prevents it following the desired algorithm and then fix it. -Children demonstrate the ability to design and code a program that follows a simple sequence. -Children are beginning to understand the difference in the effect of using a timer command rather than a repeat command when creating repetition effects. -Children think of the structure of a program in logical, achievable steps and absorb some new knowledge of coding structures. -Children make good attempts to 'step through' more complex code	-Children can carry out simple searches to retrieve digital content. They understand that to do this, they are connecting to the internet. -Children can collect, analyse, evaluate and present data and information using a selection of software. -Children can create purposeful content to attach to emails.	-Children demonstrate the importance of having a secure password and not sharing this with anyone else. -Children can explain the negative implications of failure to keep passwords safe and secure. -Children understand the importance of staying safe and the importance of their conduct when using familiar communication tools. -Children know more than one way to report unacceptable content and contact.

	in order to identify errors in algorithms and can correct this. -Children can list a range of ways that the Internet can be used to provide different methods of communication.		
YEAR 4			
	COMPUTER SCIENCE	**INFORMATION TECHNOLOGY**	**DIGITAL LITERACY**
Skills	-Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems - Children 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.	-Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. -Select, use and combine a variety of software on a range of digital devices - Design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data.	-Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; -Identify a range of ways to report concern about content and contact.

Knowledge	-When turning a real-life situation into an algorithm - Children make more intuitive attempts to debug their own programs. -Children's use of timers to achieve repetition effects are becoming more logical and are integrated into their program designs.	-Children understand the function, features and layout of a search engine. -Children 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. -Children can help others to understand the importance of online safety. -Children know a range of ways of reporting inappropriate content and contact.

	-Children understand 'IF statements' for selection and attempt to combine these with other coding structures. -Children can make use of user inputs and outputs such as 'print to screen'. -Children's designs for their programs show that they are thinking of the structure of a program in logical, achievable steps. –Children can trace code and use step-through methods to identify errors. - Children can 'read' programs with several steps and predict the outcome accurately. -Children recognise the main component parts of hardware which allow computers to join and form a network.	-Children share digital content within their community, i.e.using Virtual Display Boards.	
YEAR 5			
	COMPUTER SCIENCE	**INFORMATION TECHNOLOGY**	**DIGITAL LITERACY**

Skills	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems -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 and to detect and correct errors in algorithms and programs. -Understand computer networks, including the internet.	-Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. -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.	-Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour -Identify a range of ways to report concern about content and contact.

Knowledge	-Children may attempt to turn more complex real life situations into algorithms for a program by deconstructing it into manageable parts. -Children are able to test and debug their programs as they go and can use logical methods to identify the approximate cause of any bug but may need some support identifying the specific line of code. -Children can translate algorithms that include sequence, selection and repetition into code with increasing ease and their own designs show that they are thinking of how to accomplish the set task in code utilising such structures. -Children are beginning to think of structure in terms of the ability to debug and interpret the code later, e.g. the use of tabs to organise code and the naming of variables. -Children understand the value of computer networks but are also aware of the main dangers.	-Children search with greater complexity for digital content when using a search engine. -Children 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 objectively review solutions from others. -Children are able to collaboratively create content and solutions using digital features within software such as collaborative mode.	-Children have a secure knowledge of common online safety rules and can apply this by demonstrating the safe and respectful use of a few different technologies and online services. -Children relate appropriate online behaviour to their right to personal privacy and mental wellbeing of themselves and others.

	-Children recognise what personal information is and can explain how this can be kept safe. -Children can select the most appropriate form of online communications.		
YEAR 6			
	COMPUTER SCIENCE	**INFORMATION TECHNOLOGY**	**DIGITAL LITERACY**
Skills	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems -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 and to detect and correct errors in algorithms and programs.	-Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. -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.	-Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour - Identify a range of ways to report concern about content and contact.

	-Understand computer networks, including the internet		
Knowledge	-Children are able to turn a more complex programming task into an algorithm by identifying the important aspects of the task (abstraction) -Children can decompose them in a logical way using their knowledge of possible coding structures and	-Children readily apply filters when searching for digital content. -Children are able to explain in detail how credible a webpage is and the information it contains. -Children compare a range of digital content sources and are able to rate them in terms of content quality and accuracy.	-Children demonstrate the safe and respectful use of a range of different technologies and online services. -Children identify more discreet inappropriate behaviours through developing critical thinking. -Children recognise the value in preserving their privacy when online for their own and other people's safety.

	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, including nesting structures within each other. -Coding displays an improving understanding of variables and outputs -Children are able to interpret a program in parts and can make logical attempts to put the separate parts of a complex algorithm. -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	-Children use critical thinking skills in everyday use of online communication. -Children make clear connections to the audience when designing and creating digital content. -Children are able to use criteria to evaluate the quality of digital solutions and are able to identify improvements, making some refinements.	

	school		