Zetland Primary School

Curriculum skills and knowledge document COMPUTING

Rationale: Pupils will be provided with a high-quality computing education that enables them to use computational thinking and creativity to understand and engage with an ever-changing technical world.							
Intent: To ensure children can understand and apply the fundamental principles and concepts of computer science, including coding and data representation. To ensure children can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems. For pupils to become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world. For the children to become responsible, competent, confident and creative users of information and communication technology.			Implementation: Children will explore a range of devices, applications and online environments. Children will have sessions where skills and concepts are taught but will also have time to 'explore and discover' for themselves. As they progress through school, children will have opportunities to combine the use of devices, applications and environments when completing creative projects. Throughout all the experiences provided for the children, online-safety will be paramount. Children will use technology to support their learning across different curriculum areas.		Impact: Children will develop a love for technology. Children's confidence in Computing and their use of technology with increase. Children will make links to their uses of technology and the application of these in the real world. Children will be digitally literate and will be able to express their ideas and creativity through technology. Children will understand and apply the principles of computer science and use this to create and debug computer programs.		
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Topic or Theme	Develop the foundations of computing skills in early years that will give children a sound basis to explore topics using technology and to be ready for progressing through the Computing curriculum.	Ourselves / Homes/Online Safety (2Animate/ 2Graph) Up in the Air / Animal Kingdom(2Graph/Writing) The Secret Garden / All at Sea(2Code)		Simulations/ Online Safety / Spreadsheets Graphing / Coding / Logo Email / Databases / Animation		Databases / Online Safety / Spreadsheets Coding 3D Modelling / Concept Maps / Networks	

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National Curriculum Objectives	**Mouse and Trackpad Skills** Be able to click and navigate using a mouse. Be able to click and navigate using a touch pad. **Drawing skills** Choosing pens and style and composing drawn images on screen. Using the undo function. Mark making using touch (for touch pads) **Robots** Following and creating instructions and making predictions. **Sounds** Use of recording tools. Create music using the tools. **Photography** How to upload images to IPADs. **Technology Around Us** A selection of role-play scenarios for including technology in play. **Hardware** Introduce knowledge about the parts of a computer and how to look after equipment. **Safety and Privacy** Introduce the idea of ownership and privacy. How to recognise when you are not comfortable with something.	**Computer Science** I can understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. I can create and debug simple programs. I can use logical reasoning to predict the behaviour of simple programs. **Information Technology** I can use technology purposefully to create, organise, store, manipulate and retrieve digital content. I can recognise common uses of information technology beyond school. **Digital Literacy** I can use technology safely and respectfully, keeping personal information private; I can identify where to go for help and support when I have concerns about content or contact on the internet or other online technologies.	**Computer Science** I can design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. I can 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. I can 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. **Information Technology** I can use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. I can 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** I can use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; I can identify a range of ways to report concern about content and contact.	**Computer Science** I can design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems I can solve problems by decomposing them into smaller parts. I can use sequence, selection and repetition in programs; work with variables and various forms of input and output. I can use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. I can understand computer networks, including the internet; I understand how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration. **Information Technology** I can use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. I can 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** I can use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; I can identify a range of ways to report concern about content and contact.

Computer Science		I can explain that an algorithm is a set of instructions to complete a task. When designing simple programs, I can show an awareness of the need to be precise with their algorithms so that they can be successfully converted into code. I can work out what is wrong with a simple algorithm when the steps are out of order, e.g. The Wrong Sandwich in Purple Mash and can write their own simple algorithm, e.g. Colouring in a Bird activity. Children can create a simple program that achieves a specific purpose. I can also identify and correct some errors, e.g. Debug Challenges: Chimp.Children's. I 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.	I can turn a simple real-life situation into an algorithm for a program by deconstructing it into manageable parts. My design shows that I am thinking of the desired task and how this translates into code. I can identify an error within my program that prevents it following the desired algorithm and then fix it. I can demonstrate the ability to design and code a program that follows a simple sequence. I can experiment with timers to achieve repetition effects in their programs. I am beginning to understand the difference in the effect of using a timer command rather than a repeat command when creating repetition effects. My designs for my programs show that I am thinking of the structure of a program in logical, achievable steps. I make good attempts to 'step through' more complex code in order to identify errors in algorithms and can correct this. e.g. In programs such as Logo, I can 'read' programs with several steps and predict the outcome accurately.	I am 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. I can test and debug my program as I go and use logical methods to identify the cause of bugs. I can translate algorithms that include sequence, selection and repetition into code and my own designs show that they I am thinking of how to accomplish the set task in code utilising such structures, including nesting structures within each other. I can code with 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. I am 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.
Information Technology		I can sort, collate, edit and store simple digital content e.g. children can name, save and retrieve their work and follow simple instructions to access online resources, use Purple Mash 2Quiz example (sorting shapes), 2Code design mode (manipulating backgrounds) or using pictogram software such as 2Count. I can understand what is meant by technology and can identify a variety of examples both in and out of school. I can make a distinction between objects that use	I can list a range of ways that the Internet can be used to provide different methods of communication. I can use some of these methods of communication, e.g. being able to open, respond to and attach files to emails using 2Email. I can describe appropriate email conventions when communicating in this way. I can carry out simple searches to retrieve digital content. I can understand that to do this, I am	I can search with greater complexity for digital content when using a search engine. I am able to explain in some detail how credible a webpage is and the information it contains. I am able to make appropriate improvements to digital solutions based on feedback received and can confidently comment on the success of the solution. e.g. creating my program to meet a design brief using 2Code.

		modern technology and those that do not e.g. a microwave vs. a chair. I can effectively retrieve relevant, purposeful digital content using a search engine. I can apply my learning of effective searching beyond the classroom. I can share this knowledge, e.g. 2Publish example template. I can make links between technology I see around me and the coding and multimedia work I do in school e.g. animations, interactive code and programs.	connecting to the internet and using a search engine such as Purple Mash search or internet-wide search engines. I can collect, analyse, evaluate and present data and information using a selection of software, e.g. using a branching database (2Question), using software such as 2Graph. I can consider what software is most appropriate for a given task. I can create purposeful content to attach to emails, e.g. 2Respond.	I can objectively review solutions from others. I am able to collaborate to create content and solutions using digital features within software such as collaborative mode. I am able to use several ways of sharing digital content, i.e. 2Blog, Display Boards and 2Email.
Digital Literacy		I can understand the importance of keeping information, such as my usernames and passwords, private and can actively demonstrate this in lessons. I can take ownership of my work and save this in my own private space such as My Work folder on Purple Mash. I Know the implications of inappropriate online searches. I can begin to understand how things are shared electronically such as posting work to the Purple Mash display board. I am developing an 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.	I can explore key concepts relating to online safety using concept mapping such as 2Connect. I can help others to understand the importance of online safety. I know a range of ways of reporting inappropriate content and contact.	I can demonstrate the safe and respectful use of a range of different technologies and online services. I can identify more discreet inappropriate behaviours through developing critical thinking, e.g. 2Respond activities. I can recognise the value in preserving privacy when online for my own and other people's safety.
Key Vocabulary		Login, device, button, saving, passwords, compare, machine, algorithm, command, plan debug, event, interaction, predict, email, filter, protect, search, share, data, question	Event, implement, properties, sequence, verify, link, database, analyse, solution, command, if/else, malware, phishing, FPS	Decomposition, efficient, function, string, value, variable, evaluate, run/launch, connections, nodes
Enquiry Questions		What is a password and why should we keep them safe? In what ways can we sort objects? Why is it useful to design before coding? Why should I plan out my presentation?	Is everything I read on the Internet true? What is meant by data? What is Logo? How can variables and if/else statements be useful when coding programs with selection?	In what ways can I sort information in a database? Why is it important to reference sources in my work? How can a program receive user input? What is the difference between the Internet and the World Wide Web?
Knowledge, Skills and Processes		I can 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.	I can use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	I can use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

		I can use technology purposefully to create, organise, store, manipulate and retrieve digital content I can recognise common uses of information technology beyond school I can understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions I can create and debug simple programs I can use logical reasoning to predict the behaviour of simple programs	I can use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content I can 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 I can 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 I can design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts I can use sequence, selection, and repetition in programs; work with variables and various forms of input and output I can use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.	I can use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content I can 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 I can 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 I can design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts I can use sequence, selection, and repetition in programs; work with variables and various forms of input and output I can use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.
Organisation and Communication of Learning		I can communicate my ideas through discussion, drawing, sorting, listing or creating.	I can recall, select and organise computing information and communicate knowledge and understanding.	I can recall and sort key pieces of information to support my viewpoint or answer a question, drawing upon specific dates and events to add further detail.