

Skills Overview: Computing

Computing Rationale:

Technology is changing the lives of everyone globally. At St Peter's, we recognise this rapidly changing world, where work and leisure activities are increasingly transformed by technology. We want to equip all our learners with the necessary knowledge and skills to confidently navigate the ever-changing digital world that they will come into contact with. Computing skills and computational thinking are major factors in enabling children to become resilient, creative and critical digital citizens, understanding their role and responsibilities in the digital landscape. In addition, Computing has deep links with Mathematics, Science, and Design and Technology.

Pupils will be taught units of work that cover and go beyond the requirements of the National Curriculum in the disciplines of Information Technology (IT), Computer Science (CS), Digital Literacy (DL) and E-Safety.

Pupils will build a body of computing knowledge as they work through our curriculum. They will learn to ask and answer informative and probing questions. They will also develop a sense of curiosity about the world around us. This will give our children an introduction to fascinating content such as; computer networks and systems, programming and digital media.

Throughout our computing curriculum, knowledge is built year on year in a progressive format. Pupils have multiple opportunities to secure and build on their knowledge and understanding as subject content is revisited at points throughout the curriculum. This helps children to master the knowledge and concepts whilst building up an extended specialist vocabulary. This incremental approach helps teachers to identify knowledge gaps and look back at previous content if they need to close gaps in knowledge or understanding. Our lessons are presented in small steps, clearly explained to modelled to reduce cognitive load and encourage children to retain the knowledge that is taught. The aims of each lesson are to provide a clear learning outcome whilst still inspiring a love for computing and the history behind it.

By the time pupils leave primary school we aim to develop pupils who:

- Are responsible, confident and creative users of technology, who apply computational thinking beyond the Computing curriculum.
- Become digitally literate and are active participants in a digital world.
- Know how to stay safe whilst using technology and on the internet, minimising risk to themselves and others.
- Understand and follow agreed E-Safety rules, and know who to contact if they have concerns, including the use of report buttons.
- Have repeated practical experience writing computer programs in order to solve problems, including logic & algorithms.
- Ask and answer questions through collection, analysing, evaluating and presenting data and information.
- Understand how digital networks work & the services they provide.
- Use search options effectively; understanding the need to evaluate the relevance of content.

WHOLE SCHOOL COMPUTING OVERVIEW

	Autumn - Computer Systems and Networks	Spring - Programming	Summer - Creating Media
<p>Year 3</p> <p>Subject content and skills</p> <p>Computer Science Information Technology Digital Literacy E-Safety</p>	<p><u>Connecting computers</u> During this unit, learners develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. They also compare digital and non-digital devices. Following this, learners are introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. The unit concludes with learners discovering the benefits of connecting devices in a network.</p> <p>National Curriculum Objectives covered:</p> <ul style="list-style-type: none"> • Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; • Understand the opportunities they offer for communication and collaboration. • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. 	<p><u>Sequence in music</u> This unit explores the concept of sequencing in programming through Scratch. It begins with an introduction to the programming environment, which will be new to most learners. They will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. The unit is paced to focus on all aspects of sequences, and make sure that knowledge is built in a structured manner. Learners also apply stages of program design through this unit.</p> <p>National Curriculum Objectives covered:</p> <ul style="list-style-type: none"> • 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 	<p><u>Desktop Publishing</u> Learners will become familiar with the terms 'text' and 'images' and understand that they can be used to communicate messages. They will use desktop publishing software and consider careful choices of font size, colour and type to edit and improve premade documents. Learners will be introduced to the terms 'templates', 'orientation', and 'placeholders' and begin to understand how these can support them in making their own template for a magazine front cover. They will start to add text and images to create their own pieces of work using desktop publishing software. Learners will look at a range of page layouts thinking carefully about the purpose of these and evaluate how and why desktop publishing is used in the real world.</p> <p>National Curriculum Objectives covered:</p> <ul style="list-style-type: none"> • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.

		<p>variables and various forms of input and output.</p> <ul style="list-style-type: none"> 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"> 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.
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<p>Year 4</p> <p>Subject content and skills</p> <p>Computer Science Information Technology Digital Literacy E-Safety</p>	<p>The Internet</p> <p>During this unit learners will apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet, and be given opportunities to explore the World Wide Web for themselves to learn about who owns content and what they can access, add, and create. Finally they will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information.</p> <p>National Curriculum Objectives covered:</p> <ul style="list-style-type: none"> Understand computer networks including the internet; how they can provide 	<p>Programming - Repetition in shapes</p> <p>This unit is the first of the two programming units in Year 4, and looks at repetition and loops within programming. Pupils will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language.</p> <p>National Curriculum Objectives covered:</p> <ul style="list-style-type: none"> 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 	<p>Photo Editing</p> <p>In this unit, learners will develop their understanding of how digital images can be changed and edited, and how they can then be resaved and reused. They will consider the impact that editing images can have, and evaluate the effectiveness of their choices.</p> <p>National Curriculum Objectives covered:</p> <ul style="list-style-type: none"> 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>multiple services, such as the World Wide Web;</p> <ul style="list-style-type: none"> ● Understand the opportunities they offer for communication and collaboration. ● Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. 	<p>variables and various forms of input and output.</p> <ul style="list-style-type: none"> ● 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"> ● 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; identify a range of ways to report concerns about content and contact.
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<p>Year 5</p> <p>Subject content and skills</p> <p>Computer Science Information Technology Digital Literacy E-Safety</p>	<p><u>Sharing Information</u></p> <p>In this unit, learners will develop their understanding of computer systems and how information is transferred between systems and devices. Learners will consider small-scale systems as well as large-scale systems. They will explain the input, output, and process aspects of a variety of different real-world systems. Learners will also take part in a collaborative online project with other class members and develop their skills in working together online.</p> <p>National Curriculum Objectives covered:</p>	<p><u>Selection in physical computing</u></p> <p>In this unit, learners will use physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. Learners will be introduced to a microcontroller (Crumble controller) and learn how to connect and program it to control components (including output devices — LEDs and motors). Learners will be introduced to conditions as a means of controlling the flow of actions in a program. Learners will make use of their knowledge of repetition and conditions when introduced to the concept of selection</p>	<p><u>Vector Drawing</u></p> <p>In this unit learners will find out that vector images are made up of shapes. They will learn how to use the different drawing tools and how images are created in layers. They will explore the ways in which images can be grouped and duplicated to support them in creating more complex pieces of work.</p> <p>National Curriculum Objectives covered:</p> <ul style="list-style-type: none"> ● 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,

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web;
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(through the 'if...then...' structure) and write algorithms and programs that utilise this concept. To conclude the unit, learners will design and make a working model of a fairground carousel that will demonstrate their understanding of how the microcontroller and its components are connected, and how selection can be used to control the operation of the model. Throughout this unit, learners will apply the stages of programming design.

National Curriculum Objectives covered:

- 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.
- 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,

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<p>Year 6</p> <p>Subject content and skills</p> <p>Computer Science Information Technology Digital Literacy E-Safety</p>	<p>Communication</p> <p>In this unit, the class will learn about the World Wide Web as a communication tool. First, they will learn how we find information on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines. They will then investigate different methods of communication, before focusing on internet-based communication. Finally, they will evaluate which methods of internet communication to use for particular purposes.</p> <p>National Curriculum Objectives covered:</p> <ul style="list-style-type: none"> Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts 	<p>Variables in games</p> <p>This unit explores the concept of variables in programming through games in Scratch. First, pupils will learn what variables are, and relate them to real-world examples of values that can be set and changed. Pupils will then use variables to create a simulation of a scoreboard. In Lessons 2, 3, and 5, which follow the Use-Modify-Create model, pupils will experiment with variables in an existing project, then modify them, then they will create their own project. In Lesson 4, pupils will focus on design. Finally, in Lesson 6, pupils will apply their knowledge of variables and design to improve their game in Scratch.</p> <p>National Curriculum Objectives covered:</p> <ul style="list-style-type: none"> Design, write and debug programs that accomplish specific goals, including controlling or simulating physical 	<p>Web page creator</p> <p>This unit introduces learners to the creation of websites for a chosen purpose. Learners identify what makes a good web page and use this information to design and evaluate their own website using Google Sites. Throughout the process learners pay specific attention to copyright and fair use of media, the aesthetics of the site, and navigation paths.</p> <p>National Curriculum Objectives covered:</p> <ul style="list-style-type: none"> 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 search technologies effectively, appreciate how results are selected

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