

## Compass School Southwark KS3 Plan – Computing

	Year 7	Year 8	Year 9
Term 1	<p><b>Introduction to computational thinking</b> <i>Enquiry Question – What is computational thinking?</i></p> <p>Students will learn about the importance of computational thinking and how it relates to everyday problem solving. Students will be given several scenarios where they are challenged to solve a problem and identify where each aspect of computational thinking has been demonstrated.</p>	<p><b>Using technology safely, securely and responsibly</b> <i>Enquiry Question – Are we ever safe online?</i></p> <p>Students will learn about some of the legal safeguards regarding computer use, including overviews of the Computer Misuse Act, Data Protection Act and Copyright Law and their implications for computer use.</p>	<p><b>Computational Thinking &amp; Algorithms</b> <i>Enquiry Question – Can a computer think?</i></p> <p>Students will develop their computational thinking through increasingly sophisticated problems. They will learn how to produce algorithms to describe the solutions to problems using a range of styles, including pseudo code and flow charts.</p>
Term 2	<p><b>What are computers?</b> <i>Enquiry Question – What are computers?</i></p> <p>This scheme of work will give learners an understanding of the key components that make up a computer system, input and outputs, basic binary conversation, health and safety aspects of using technology and the various types of operating systems.</p>	<p><b>The Internet and the WWW</b> <i>Enquiry Question – Will the Internet slow down as it grows bigger and gets older?</i></p> <p>Students learn about the WWW and the internet, the differences between the two. They learn about the different services that can be used on the internet e.g. Voice over Internet Protocol. They will be able to outline the key features of the World Wide Web and their relationships– e.g. browsers, URLs, navigation methods and how to use search engines to do a basic query.</p>	<p><b>Developing programming techniques</b> <i>Enquiry question – How do sorts work?</i></p> <p>Students will learn to programme using Python. Through small projects, they will learn the basic syntax and programming structures required to develop larger programmes. Students will understand the differences between different types of data queue and sorting algorithms, and use these to store and retrieve information. Finally, students will learn how to test and debug the programs that they write.</p>
Term 3	<p><b>Control systems</b> <i>Enquiry Question – How can we solve problems with programs?</i></p> <p>Students will learn how to produce flowcharts that use simple loops and basic outputs, and then move on to look at systems that have multiple inputs and outputs. They will refine their solutions using subroutines and variables. Students will learn the importance of abstraction and decomposition and evaluate the different algorithmic solutions they could produce to solve the variety of mimics.</p>	<p><b>Build a game (Scratch)</b> <i>Enquiry Question – Why are computer games fun?</i></p> <p>Students will learn how to create a complex game that involves multiple procedures created by the pupil. The Students evaluate the programs created by other Students and give advice how to improve the game.</p>	<p><b>Major project I</b> <i>Enquiry question – What makes a good user interface?</i></p> <p>Students will be given a brief to create a software program for a specific purpose. The students will focus on the specification and visual design and user interface for the software.</p>

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Term 4	<p><b>Building a game</b>  <i>Enquiry Question – Why are computer games fun?</i>            Students will develop several algorithms and implement them into creating elements of a game. They will at the end of unit produce a game to meet a set of user requirements and evaluate the effectiveness of what they have produced against the user requirements.</p>	<p><b>Data, Information and Knowledge</b>  <i>Enquiry Question - How can computers store and process everything in 1's and 0's?</i>            Students will learn how data becomes information and then eventually knowledge. They will see how images, audio and video is represented in binary and will edit media files. They will see how different file types lead to different size files and the implications for file storage, and file transfer (bandwidth issues).</p>	<p><b>Major project II</b>  <i>Enquiry question – Why should code be efficient?</i>            Building on the design work from the previous term, students will produce the algorithms to support their idea. They will produce pseudo code algorithms, before programming the application using Python.</p>
Term 5	<p><b>Shapes and patterns</b>  <i>Enquiry Question – Why is programming simple?</i>            Students will develop several algorithms to create shapes. They will learn about how the algorithm can be written in several different ways to accomplish the goal and they will evaluate the effectiveness of the solution they have produced.</p>	<p><b>Designing a computer system</b>  <i>Enquiry Question - How can we design the fastest computer system in the World?</i>            Students learn how to develop a computer system to meet the needs of an end user. They will design algorithms, evaluate the effectiveness of the design and implement the plan into a program to be used.</p>	<p><b>Major project III</b>  <i>Enquiry question – How do we ensure that computer programs are robust?</i>            Students will complete their coding project by testing and debugging, as well as evaluating their application/            By the end of the term they should have a working application which meets the brief set.</p>
Term 6	<p><b>Raspberry Pi</b>  <i>Enquiry Question – How do traffic lights work?</i>            Students will learn how to use a Raspberry Pi and understand what physical computing is. They will get hands on with the different elements of a computer in particular the inputs and outputs through the GPIO. Students will used LEDs and buttons to create a working traffic lights system. Using their CT skills they will program the traffic light through scratch on the Raspberry Pi.</p>	<p><b>Raspberry Pi</b>  <i>Enquiry Question – When does computers become invisible?</i>            Students will learn how to use a Raspberry Pi and understand what physical computing is. They will get hands on with the different elements of a computer in particular the inputs and outputs through the GPIO. Students will design their own questions, and use inputs and outputs to create a game-style quiz setup in the classroom.</p>	<p><b>Create your own phone app</b>  <i>Enquiry question – What makes a mobile phone app addictive?</i>            As students start to prepare for GCSE, students will use all of the skills they have developed throughout the year to design and create a simple application. By the end of the term, they will have an app which could be installed onto a phone.</p>