

**EMMANUEL COLLEGE**  
**THE BUSINESS AND COMPUTING DEPARTMENT**  
 Year 8 Computing



Year 8	Autumn, Half Term 1	Autumn, Half Term 2	Spring Term
<b>Unit Title</b>	Digital Literacy	Computational Thinking	Spreadsheets
<b>Key Question(s)?</b>	What are the main online threats and how do I protect myself? What is our digital footprint, how can it impact me and how can I control mine?	What do we mean by algorithmic thinking? How do selected search and sort algorithms operate?	What are spreadsheets and what are they used for? What spreadsheet tools and operations make them so powerful?
<b>Threshold Concepts</b>	It is important to keep your personal information safe. The online world can be dangerous and understanding how to keep safe is essential.  A digital footprint is the internet data trail relating to an individual. It contains anything they post, anything posted about them and any information they have entered onto a website as well as any site they have visited.	Computational thinking allows you to be able to solve big and complex problems by employing certain skills and techniques. It can be employed in any situation where one may face a large or complex task and is employed to better understand real-world problems and approach them in a way that makes it easier to develop programs to help manage them.	Spreadsheets are application software programs used to store information and data that is usually predominantly made up of numbers. Once information is in a spreadsheet, we can run powerful calculations, make graphs and charts, and analyse patterns.
<b>Link to Prior Learning</b>	This unit builds on the Year 7 unit on digital literacy and the students' understanding of basic computer security.	This unit builds on knowledge acquired of computer systems and, to a lesser extent, the algorithm design and constructs units from Year 7.	This unit draws from the Year 7 unit on algorithm design and concepts when considering data types, constructing formulae, functions and graphs. It also draws on the computational thinking skills developed in the previous Year 8 unit.
	<b>Summer Term</b>		
<b>Unit Title</b>	Programming		
<b>Key Question(s)?</b>	What constructs are employed in programming languages and how do they operate?		
<b>Threshold Concepts</b>	All programs need to have the facility to output information to the screen, accept data input by the user, and employ variables to store information that can change during the execution of the program.  Most programming languages need data to be specified by its type. Common datatypes are string, integer, float and Boolean. The data type of a piece of data or variable can be specified		

	at the beginning on the program or will be the default type. The data type of a piece of data can be converted (changed) through casting.
<b>Link to Prior Learning</b>	This unit builds directly on Algorithm Design and Constructs covered in Year 7 giving students the opportunity to employ the constructs using a programming language suitable to their ability and prior learning, ideally text-based such as Python, but could be block-based, e.g. Scratch.
<b>Knowledge and Sequencing Rationale</b>	<p>As students mature, new threats emerge regarding their use of the internet and we need to be more specific about these threats so that they can understand and protect themselves both now and as adults.</p> <p>Understanding how to employ computational thinking to solve complex problems is an ability that is useful way beyond the computing curriculum, so familiarising students with the skills to enable them to do so is vital. Becoming familiar with some key searching and sorting algorithms helps students to develop algorithmic thinking and identifying best-use scenarios demonstrates generalisation, as does the appreciation that programmers do not construct every element of their program from ground-level, but can employ algorithms and methods used in prior programs.</p> <p>Spreadsheets are a commonly used application in business and can be useful as an individual to manage household budgets and estimate repayments, etc. Many of the functions introduce conditions that give instant feedback and do not require the volume of syntax knowledge needed when employing them in a programming language, hence being a useful, low-risk way for students to familiarise themselves with them. Thus, the scheduling of this unit is prior to the programming one.</p> <p>All computer systems are controlled by software that outlines the tasks we can complete on a computer and how this must be done. Writing programs is one way students can demonstrate their computer science knowledge. It also gives the opportunity for students to learn in the most suitable environment – text-based such as Python, or block-based, e.g. Scratch, or even different technologies – PCs, BBC MicroBits, Raspberry Pis, etc.</p>

