IT and Computer Science Department 2023-2024

	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR 13
TERM 1	This term students will be looking at the how to operate and utilise emails, Teams, OneNote and Word. They will be introduced to the basic functions of these programs and how they are integrated into Brooke Weston systems, allowing the learners to take advantage of all the resources offered by Brooke Weston. This will enable them to complete the rest of the KS3 ICT curriculum as these programs are used	Students will be introduced to what cyber security is and how it plays a role in their use of the internet and various devices. They will learn about the various cyber security attacks that exist as well as how to protect themselves from these attacks. Students will also develop an understanding as to why it is important to protect their personal data.	Students will complete the final work regarding graphics, before starting with media to promote E-safety. In this term they will use SharePoint's web design functionality to create a webpage containing information about E-safety online.	**Computer Science** **Unit 1.1 Systems Architecture** This term students will be looking at the architecture of CPU and basics of programming. -Processor Architectures -Processor Performance -Types of Processors -Input Devices -Output Devices -Embedded Systems	**Computer Science** **Unit 2.5 Programming languages and IDE's** **Unit 1.5 systems Software** This term students will learn about advanced programming techniques and creating their own programme. -Characteristics of programming languages - High level/low level languages -Translators Compliers/Interpreters -Facilities of IDEs SQL and simple data base records -Operating systems -Memory management -Peripheral Management	**Computer Science** **Unit 1. Components of a CPU** This term students will learn about Structure and function of the processor -Processor Components -Processor Perfromance -Types of Processor -Input devices -Output devices **Unit 10. Computational Thinking** -Thinking Abstractly -Thinking Ahead -Thinking procedurally -Thinking logically -Thinking concurrently	**Computer Science** **Unit 4: Exchanging Data** -Compression, Encryption and Hashing Data base concepts -Relational databases and normalisation Structured query language SQL Transaction processing **Unit: Personal Programming Project** -Design of the solution -Decompose the problem Describe the problem Planning for testing

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	throughout the entire course.				-User and File management	-Problem Recognition -Problem solving	
TERM 2	Students will be taught how to utilise PowerPoint to create high quality visual and functional PowerPoint presentations. This knowledge will then be tested by a PowerPoint project, which they will create as their assessment for term 2's content.	Students will learn what makes up a network and what the different components do.	During this term students will be introduced to the basics of binary and Boolean logic. Learners will be taught what binary is and how the computer uses it to communicate and execute instructions. Students will also be introduced to the basic types of logic gates and Boolean functionality of these gates. Students will be briefly introduced to algorithms at the end of the term.	**Computer Science** **Unit 2.1 Algorithms Programming Fundamentals** This term students will start the term learning about Memory and Storage and continue learning about Algorithms alongside. We are also learning additional programming techniques in Python. -Abstraction -Decomposition -Designing algorithms -Algorithmic Thinking - Pseudocode and Flow diagrams -Sequence -Iteration -Use of primitive data types -Common arithmetic operators	**Computer Science** **Unit 1.3 Networks** **Unit 1.4 Network Safety** This term students will learn about the characteristics and purpose of different levels of programming Language and Network security & Systems software. -Networks and topologies -LAN/WAN -Network performance -Networking hardware -Networking protocols -Forms of Network attack -Identifying and preventing vulnerabilities	**Computer Science** **Unit 6: Data Types** -Primitive Data types binary and hexadecimal -ASCII and Unicode -Binary Arithmetic -Floating Point Arithmetic -Bitwise manipulation masks **Unit 11: Programming Techniques** -Programming basics Use of IDE Selection Iteration Subroutines Recursion Use of Object orientated techniques	**Computer Science** **Unit 2: Systems software** -Functions of an operating system -Types of operating systems -The nature o applications -Programming language translators **Unit 11: Programming Techniques** -Developing the solution -Iterative development process Testing to inform development -Evaluation -Testing to inform evaluation -Success of the solution -Describe the final product -Maintenace and development -Project Documentation -Project submission

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TERM 3	Students will learn what is represented by the hardware, as well as the software component of a computer. Students will be able to identify and provide the various functions of the different hardware components associated with a computer. Students will also be introduced to the various categories of software that can be found on a computer.	Students will expand on their knowledge developed in year 7 by learning about various functions and arithmetic performed in Excel. Students will also be taught how to utilise Excel for its mathematical use cases.	After the brief introduction from the previous term, algorithms will be expanded on in more detail for an additional 2 lessons. Students will be taught what the purpose of algorithms are and how to create them using flow charts. The majority of the term, however, will be spent introducing the basics of Python to the learners. Learners will be taught the very basics of Python allowing them to produce basic programs.	**Computer Science** **Unit 1.2 Memory and storage** -Primary storage -Secondary Storage -Data Units -Binary and hexadecimal values -ASCII and Unicode Binary Arithmetic and Shift -Representing images –Representing Sound compression	**Computer Science** **Unit 1.5 Systems Software** **Unit 1.6 Ethical, Legal, Cultural and Enviromental** This term students will learn about Defensive design & Testing and Ethical, legal, cultural and environmental impacts. -Encryption software -Defragmentation -Data compression -Ethical issues -Legal issues -Cultural issues -Enviromental issues -Privacy Issues -Data protection Act -Computer Misue Act -Copyright Designs and patents -Software Licencing	**Computer Science** **Unit 7: Data Structures** -Array, tuples and records -Queues -Stacks -Lists and linkes lists -Hash tables -Graphs -Trees -Binary Trees -Traversal methods and algorithms (unit 12) **Unit 3: Software development** -Systems analysis methods -Writing and following algorithms -Programming paradigms Assembly language	**Computer Science** **Unit 5: NEtwork and Web tehcnologies** -Structure of the internet -Internet communications -Network security and threats -HTML and CSS -Web Forms and JavaScript -Search engine indexing -Client server and peer to peer **Unit 9: Legal, Moral, Ethical and Cultural issues** -Ethical, Moral and cultural issues Privacy Censorship

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TERM 4	Students will be introduced to the basics of Excel. These basic characteristics will allow students to understand what the layout of an excel spreadsheet looks like and how to utilise it functionality. This knowledge will act as the foundation for the content they will be taught in year 8, which will expand their Excel knowledge.	This term students will be taught how the computer "thinks" in terms of the functioning of the CPU and the various components involved in this process. Students will also be introduced to programming concepts through the use of Edublocks.	Students will be introduced to Microbits. Together with their programming knowledge, from the previous term, they will be tasked to complete a final project.	**Computer Science** **Unit 1.1, 1.2, 2.1 and 2.2** Revision activities for all units.	**Computer Science** Unit 1.1, Unit 1.2, Unit 1.3, Unit 1.4, Unit 1.5, Unit 2.1, Unit 2.2, Unit 2.3, Unit 2,4, Unit 2.5 This term student will be revising and preparing for their exams	**Computer Science** **Unit 1,6,7,3,10,11** This term student will be revising and preparing for their exams **Unit: mini programming project** -Analysis of the problem -Design the solution -Developing a solution -Evaluation	**Computer Science** **Unit 12: Algorithms** -Analysis and Design Searching algorithms Linear. Binary and recursive -Sorting algorithms, Bubble, insertion, merge, quick -Optimisation algorithms **Unit 1, 6 and 7** This term student will be revising and preparing for their exams

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TERM 5	This term students will be looking at Programming essentials. Applying the programming constructs of sequence, selection and iteration in Scratch.	Continuing from the previous term, students will expand their knowledge surrounding the use of Edublocks. This will help them build a more concrete understanding of programming, which will prepare them for learning about Python. The students will also be introduced to graphics, where they will learn to create and manipulate various graphical elements like charts, tables, etc. This will continue into year 9.	Students will continue with their project from the previous term. Students will also spend their final lessons expanding their knowledge about Microbits.	**Computer Science** **Unit 2.4: Boolean Logic** **Unit 2.1 Algorithms** **Unit 2.3 Producing Robust Programs** - Boolean -Truth Tables -Combining Boolean operators -Applying logical operations -Boolean Logic -Binary/Linear -Bubble -Defensive Design -Input Validation -Authentication -Designing for testing –Syntax and logical errors -Refining algorithms	**Computer Science** **EXAMINATIONS**	**Computer Science** **Unit 8: Boolean Algebra** -Logic Gates -Truth Tables -Simplifying Boolean expressions -Karnaugh maps -Address -D-Type Flip flops **Unit: Personal programming project** -Analysis of the problem -Problem identification -Stakeholders -Research the Problem -Specificy the proposed solution	**Computer Science** **Unit 4,2,5,12, 8, 10 and 11** This term student will be revising and preparing for their exams