

## Computer Science

### Curriculum Intent

It is our intention to enable all learners to become digital citizens – individuals that are able to employ the wide range of digital resources that are available to them in modern society. The curriculum will equip them with the knowledge in computational thinking and problem-solving abilities, preparing them with the skills required to be successful in their future careers.

We want students to build resilience and become creative, critical thinkers who can apply their skills to any challenging situation. This includes being able to use a variety of IT and programming software. In the curriculum we hope to develop students' knowledge, skills and understanding through exposure to key computational concepts. The Computing curriculum has been designed to ensure learners have sufficient knowledge to stay safe online, understanding how computers work and be confident when using them.

Our broad and balanced curriculum is designed to prepare students with the skills and understanding to live and work with evolving and fast-changing technologies that are associated with the digital age

Year 8	Year 9	Year 10 & 11 (OCR)	Year 12 & 13(OCR)
<p><b>T1 - How to be a responsible user of digital technology</b> Students will be learning about online safety, <b>Cyber Security</b> (<i>Cesar Cipher and Brute Force Attacks</i>)</p> <p><b>T2 - How do you represent numbers in a computer system?</b> <i>Students will learn the 8bit table and convert from denary to binary,</i></p> <p><b>T3 - What is the purpose of Logic Gates and Algorithms</b> <i>Binary Logic (AND, NOT , OR) and Flowcharts</i></p> <p><b>T4 - Using High Level Language to create hyperlinked documents</b> <i>Learn HTML and JavaScript to create</i></p>	<p><b>T1 - How do you represent numbers and characters in a computer system?</b> <i>Characters using ASCII, Metadata.</i></p> <p><b>T2 - What is the purpose of Boolean Statements with Logic Gate?</b> <i>Converting Boolean statements to Logic circuits and Vice Versa</i></p> <p><b>T3 - What is Computational Thinking and Algorithms</b> <i>Using Abstraction and Decomposition. Using Searching Algorithms Creating Algorithms (Flowchart and Pseudocode) and tracing the stages of the construct.</i></p> <p><b>T4 - What are the principles in High level programming</b></p>	<p><b>T1 -COMP01 Systems architecture</b> <i>the purpose of the CPU, Von Neumann architecture and Registers</i> <b>Year 11 -Practical Programming + Algorithms In Producing Program Techniques</b></p> <p><b>T2 - COMP01 Memory and Storage</b> <i>Primary, Secondary and Virtual Memory + why data is represented in computer systems in binary form</i> <b>Year 11 -Practical Programming + Programming fundamentals</b></p> <p><b>T3 - Algorithms</b> Principles of Computational thinking,</p>	<p><b>T1 - COMP01</b> <i>Structure and Function of Processor, Types of Processor, Input, Output and storage, Systems Software</i> <b>YR13 - Project + Comp01 Moral and Ethical Issues</b></p> <p><b>T2 - COMP01</b> <i>Applications Generation (The nature of applications, justifying suitable applications for a specific purpose), Utilities, Software Development (Project methodologies)</i> <b>YR13 Project + COMP02 Programming Techniques</b></p>

<p><i>interactive websites</i></p> <p><b>T5- How is the digital world connected</b> Students will learn about the www, internet and networking</p> <p><b>T6- Spreadsheet Modelling</b> <i>Computer Modelling, formulae, validations, conditional formatting, Use relative and absolute referencing</i></p>	<p><b>Creating programs using</b> <i>Using Sequence, Selection and Iteration to build high level language programs</i></p> <p><b>T5- The connected World -</b> Protocols, Topologies, LAN WAN Be able to explain how the connected world works and the differences in networks</p> <p><b>T6 - Computer Graphics - Photoshop</b> Students will explore creative skills and develop their skills of digital artefacts. This is a strand within the ICT curriculum and will allow students to hone in on the ethics, theory and practical aspects of graphic design</p>	<p>Designing, creating and refining algorithms, Boolean logic, Searching and sorting algorithms</p> <p><b>Year 11 - Practical Programming + Additional programming techniques</b></p> <p><b>T4 COMP01 Computer Network</b> Computer networks types, topologies, connections, protocols, Wired, wireless networks, Addresses, and Security <b>COMP 02 Programming fundamentals</b></p> <p><b>Year 11 - Practical Programming + Producing robust programs + System Software, Ethical, legal, cultural and environmental concerns</b></p> <p><b>T5 - COMP01 Computer Systems Software</b> <i>Operating systems, Utility software</i> <b>Comp 02 Producing robust programs</b></p> <p><b>Year 11 - Practical Programming + Algorithms + Revision</b></p> <p><b>T6 COMP02 Computational thinking, algorithms and programming</b> <i>Programming languages and Integrated Development Environments , Translators &amp; Facilities, characteristics and purpose of different levels of programming language</i> <b>Year 11 - Revision Comp 01/02</b></p>	<p><b>T3 Types of Programming Language</b> <i>Need for and characteristics of a variety of programming paradigms</i> <b>YR 13 - Project + Computational Methods + Revision</b></p> <p><b>T4-Compression, Encryption and Hashing</b> <i>Symmetric and asymmetric encryption, Lossy vs. Lossless compression, Run Length</i> <b>Databases - Relational database, flat file, primary key, foreign key, secondary key, entity relationship modelling, normalisation and indexing, SQL</b> <b>YR13 - Algorithms + Revision</b></p> <p><b>T5 Networks + Web Technologies</b> <i>Characteristics of networks and the importance of protocols and standards.</i> <b>Computing related legislation</b> <b>YR13 - Revision</b> <b>T6 - Data Types + Boolean Algebra</b> <i>Primitive data types, integer, real/floating point, character, string and Boolean.</i> <b>COMP02 Computational Thinking</b></p>
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Literacy Link: Keywords / Technical Vocabulary will be highlighted and discussed

