

Subject: GCSE Computer Science

Curriculum Intent Document:

	Year 10	Year 11
Autumn 1	Topic: Paper 1 – Computational Thinking and Programming Skills	Topic: Paper 2 – Computing Concepts
Autumn 2	<u>Content covered, including knowledge and skills:</u>	<u>Content covered, including knowledge and skills:</u>
Spring 1	<u>Unit 1 – Algorithms</u>	<u>Unit 3 – Data Representation</u>
Spring 2	1.1 – Representing Algorithms 1.2 – Tracing Algorithms 1.3 – Search Algorithms 1.4 – Bubble Sort 1.5 – Merge Sort	3.1 – Number Bases 1 3.2 – Number Bases 2 3.3 – Binary Arithmetic 3.4 – Units of Information 3.5 – Representing Text 3.6 – Representing Images 3.7 – Representing Sound 3.8 – Compression
Summer 1	<u>Unit 2 – Programming</u>	<u>Unit 4 – Computer Systems</u>
Summer 2	2.1 – Data Types Operators 2.2 – Storing Data and Selection 2.3 – Iteration 2.4 – Boolean Operations 2.5 – Randomness 2.6 – Arrays 2.7 – Strings 2.8 – Records	4.1 – Hardware and Software 4.2 – Languages and Translation 4.3 – Boolean Logic 1 4.4 – Boolean Logic 2 4.5 – The CPU 4.6 – Main Memory and Embedded Systems 4.7 – Secondary Storage

	<p>2.9 – Subroutines 2.10 – Data Validation</p> <p><u>Links to prior learning:</u></p> <p>Year 8</p> <ul style="list-style-type: none"> - Algorithms - Python Programming <p><u>Links to British Values and SMSC</u></p> <p>Students will be able to refine and develop their problem solving skills, being able to look at projects and problems by breaking them down and simplifying them.</p> <p>Students will be able to learn content both in a theoretical context but also a practical context with practical programming tasks and project work based around a school context.</p> <p><u>Career opportunities:</u></p> <ul style="list-style-type: none"> - Software Engineer - UI Engineer - Project Manager 	<p><u>Unit 5 – Networks</u></p> <p>5.1 – Types of Network 5.2 – Protocols 5.3 – Network Security 5.4 – The TCP/IP Layer Model</p> <p><u>Unit 6 – Cyber Security</u></p> <p>6.1 – Cyber Security Threats 6.2 – Social Engineering and Malware 6.3 – Preventing Threats</p> <p><u>Unit 7 – Databases</u></p> <p>7.1 – Relational Databases 7.2 – SQL</p> <p><u>Unit 8 – Ethical Issues</u></p> <p>8.1 – Ethical Issues 8.2 – Legal and Environmental Issues</p>
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Literacy: Key words and terminology:

Unit 1 Algorithms

- Algorithm
- Decomposition
- Abstraction
- Flowchart
- Linear Search
- Binary Search
- Swap
- Pass
- Comparison
- Combine
- Merge
- Split
- Divide
- Efficiency

Unit 2 Programming

- Integer
- Real/Float
- Boolean
- Character
- Casting
- Quotient
- Modulus
- Assignment
- Comparison
- Variable

Links to prior learning:

- Year 8 - Networks
- Year 7 - Data Representation
- Year 7 - Cyber Security
- Year 8 - Computer Systems
- Year 9 - Ethical Issues

Career opportunities:

- Hardware Engineer
- Database Technician
- IT Technician
- Network Manager
- Web Designer
- HR Manager
- Systems Administrator

Links to British Values and SMSC

Students will learn different theoretical aspects of Computer Science. These skills will allow students to be able to expand their numeracy skills with dealing with Data Representation as well as their literacy skills dealing with Ethical Issues. Students will be able to gain an understanding of how exactly Computer Systems work and function by looking at the properties of different hardware

	<ul style="list-style-type: none"> - Constant - Default - Iteration - Step Count - Seed - RNG - Structure - Element - Index - Dimension - Concatenation - Manipulation - Position - Substring - Data Structure - Field - Attribute - Subroutine - Function - Procedure - Parameter - Return Value - Local - Global - Scope - Structured Programming - Erroneous - Syntax - Logic - Authentication 	<p>components. Students will also learn the SQL programming language which is used exclusively with database management, allowing students to be able to manipulate data and know the best practice in data keeping.</p> <p><u>Literacy: Key words and terminology:</u></p> <p><u>Unit 3 - Data Representation</u></p> <ul style="list-style-type: none"> - Binary - Decimal - Hexadecimal - Megabyte - Gigabyte - Terabyte - Pixel - Resolution - Colour Depth - Sample - Run Length Encoding - Huffman Coding <p><u>Unit 4 – Computer Systems</u></p> <ul style="list-style-type: none"> - Application - Utility - Software - Hardware - XOR
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- Validation

- Logic Gate
- Truth Table
- CPU
- Bus
- Cache
- Core
- Register
- Main Memory
- RAM
- ROM
- Volatile
- Non-Volatile
- Cloud Storage
- HDD
- SSD
- Flash Memory
- Magnetic Storage
- Embedded System

Unit 5 – Networks

- PAN
- LAN
- WAN
- VPN
- HTTP(S)
- FTP
- SMTP
- IMAP
- TCS/UDP

- TCP/IP Layer Model
- Firewall
- Link Layer
- Internet Layer
- Application Layer
- Transport Layer

Unit 6 – Cyber Security

- Virus
- Trojan
- Phishing
- Pharming
- Social Engineering
- Penetration Testing
- Black Box/White Box
- Anti Malware
- CAPTCHA
- Biometrics

Unit 7 – Databases

- Primary Key
- Foreign Key
- Relational Database
- Relationship
- Field
- Attribute
- Record

		<ul style="list-style-type: none">- Query- Parameter <p><u>Unit 8 – Ethical Issues</u></p> <ul style="list-style-type: none">- Data Protection Act- Computer Misuse Act- Environmental Concerns- Cybernetics- Autonomous Vehicles- Privacy
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