

Key Concepts and End Points

Intent Statement:

Computer Science/ICT department must equip our students with the knowledge, skills and understanding to be able to take advantage of future technological developments. We aspire to enrich students with a varied and deep understanding of computing developments, concepts and the impact of technology on society and environment.

Students learn a diverse range of practical skills and study the theory behind the science of computing, the Internet and the ever-growing importance of our personal security and privacy.

The Computer Science/ICT curriculum at KEVI HWGA has been sequenced as such to allow students to acquire the knowledge and understanding of the subject specific key concepts across the Key Stages, working towards the Computer Science/ICT curriculum End Points.

Interconnection and review of topics is critical to our learning journey and students are allowed plentiful opportunities to apply learnt skills in a variety of contexts.

End points have been designed to align with both the National Curriculum at KS3 and build on these through the use of the Edexcel Exam Boards specifications at KS4 & KS5.

Curriculum End Points

1. Be able to use technology responsibly and create high quality products (documents, websites, spreadsheet models, multimedia presentations and logos) and analyse data to make analytical decisions.
2. Understanding of how to use algorithms to solve problems
3. Be able to use a computer program to write code
4. Be able to use Mathematical and Logical concepts to solve problems
5. Understanding of different networks and how they communicate
6. Understanding of different security issues and how to deal with them
7. Be able to explain the different hardware in computers and how they work together
8. Be able to evaluate real world issues by personal experiences and real like experiences
9. Be able to manage data effectively and demonstrate skills in presenting and making important decisions

Key Concepts:

1. Problem solving: abstraction, decomposition, pattern recognition, algorithms, trace tables, errors, selection, iteration, data structures, sub-programs
2. Algorithms: Interpret algorithms, create algorithms purpose of an algorithms, output of an algorithms, error correction for algorithms, data structures, bubble sort, merge sort, linear search, binary search, evaluating algorithms
3. Programming Constructs: analysis, design, coding, testing, fixing bugs, evaluating
4. Mathematical concepts and logic: Binary conversion, hex conversion, binary addition, binary subtractions, binary shifts, overflows, twos complement, sign and magnitude, compression, image calculations, sound calculations, file calculations, file storage conversion, logic gates
5. Hardware and Software: Hardware, CPU, computer parts, internal parts, external parts, memory, secondary memory, Von Neumann, different software, operating systems, utility software, using proprietary software to create professional products, IT systems
6. Communication and coordination: WWW, internet, communication online, encryption, protocols, packet switching, routing, authentication, network topologies, network hardware
7. Digital Literacy: E-Safety, searching online, legislation, impact of digital media, fake news, online footprint, using Microsoft Office, evaluation information
8. Data Management: data gathering, use of spreadsheet modelling, create databases, analyse data, make predictions, recommend ideas, use analytical skills to reach decisions, present information using data management skills



Key Stage 3 – Concepts mapped by topic

Topic	Autumn Term		Spring Term		Summer Term	
	HT1	HT2	HT1	HT2	HT1	HT2
Year 7	Use of Technology & Applications	E-Safety	Flowol	Binary	Multimedia	Introduction to Python
	Problem solving	Algorithms	Programming Constructs	Mathematical concepts and logic	Hardware and Software	Communication and coordination
Year 8	Website Development		Programming – Use of Scratch	Introduction in Python Programming	Introduction in Python Programming	Computer Crime & Cyber Security
	Problem solving	Algorithms	Programming Constructs	Mathematical concepts and logic	Hardware and Software	Communication and coordination
Year 9	Programming - Advanced Python		Multimedia	Digital Graphics	Social/Cultural & Environmental impact of Digital Technology	Exploring User Interface Design Principles and Project Planning Techniques
	Problem solving	Algorithms	Programming Constructs	Mathematical concepts and logic	Hardware and Software	Communication and coordination

**** Key Concepts:**

Problem solving

Algorithms

Programming Constructs

Mathematical concepts and logic

Hardware and Software

Communication and coordination

Digital Literacy

Data Management

Topic	Autumn Term		Spring Term		Summer Term	
	HT1	HT2	HT1	HT2	HT1	HT2
GCSE OCR CS Year 10	1.1 System Architecture	1.2 Memory and Storage	1.3 Computer networks, connections and protocols	1.4 Network Security	1.5 Systems Software	1.6 Ethical, legal, cultural and environmental impact
	Blue, Pink, Red, Pink		Yellow, Green	Cyan	Pink, Blue, Red	Green, Yellow, Grey
GCSE OCR CS Year 11	2.1 Algorithms and 2.3 Programming		2.4 Boolean Logic	2.5 Programming languages and IDEs		
	Green, Yellow, Blue, Red		Green, Yellow, Grey	Green, Yellow, Grey	Teal, Red	Blue, Red
BTEC L2 DIT Year 10	Component 1 LAA	Component 1 LAB/C	Component 2 LAA	Component 2 LAB	Component 2 LAB	Component 2 LAC **Moderation by 15 th May (the latest)
	Blue, Red	Blue, Red, Pink	Blue, Red	Teal	Teal	Blue, Red

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Mathematical concepts and logic

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Topic	Autumn Term		Spring Term		Summer Term	
	HT1	HT2	HT1	HT2	HT1	HT2
BTEC L3 in IT Year 13	Unit 2 – Creating Systems to Manage Information		Unit 6 – Website Development			
BTEC L3 in IT Year 12	Unit 1 – Information Technology Systems		Unit 3 – Using Social Media in Business		Unit 6 – Website Development	

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