Key Stage 3 Curriculum

Subject: Computing & ICT

Head of Department: Mrs N. Issa

Computing allows students to understand computers and how they work, so that they develop into discerning users of technology. Computing encompasses ICT and Computer Science, to enhance students' digital literacy, something ever more important in our age of technological advances.

In key stage 3, all students do Computer Science. This gives them the opportunity to gain an introduction into Python I, to learn about the different Computer Systems, Spreadsheet modelling, e-safety, system security and software.

In Key Stage 3, pupils study the following:

Term	Year 7	Year 8	Year 9
Autumn	**Topic:** Computer Systems **Fertile Q**: What's under the bonnet of your PC? **Content:** • Network and issuing Passwords • Logging into computer • File management and Class rules • Input/output devices • Memory RAM/ROM • CPU & Fan • Secondary Storage • Graphics Card • System & Operating Software	**Topic:** Computer Hardware **Fertile Q1**: How can we design the fastest computer system? **Content:** • Von Neumann Architecture • CPU components • Fetch-decode-execute • CPU performance factors • Virtual Memory • Secondary Storage Technology	**Topic**: Networks **Fertile Q:** Will the internet slow down as it grows bigger and gets older? **Content:** • LAN vs WAN • Network Hardware • Factors affecting Network performance • Topologies: Star/Bus Ring/Mesh • Client-server & peer-peer • Internet: DNS/IP/Web hosting & Cloud • Network threats • Preventative Methods
Spring	**Topic**: Intro to Python I **Fertile Q**: Can a computer be more intelligent than the human who programmed it? **Content**: • Algorithms • FLOWOL	**Topic**: Introduction to Modelling **Fertile Q**: Can a computer modelling software replace our decision making process? **Content**:	**Topic:** Introduction to Python II **Fertile Q**: Can a computer be more intelligent than the human who programmed it? **Content:** • Binary numbers

	• Sequence • Selection • Iteration WHILE • Computational thinking • Programming Python ART	• Basic worksheet structure • Basic formula • Functions • If statements • Creating Charts • Conditional formatting • Filtering & Sorting • GUI	• Logic Gates • Sequencing of Instructions • Planning using Flowcharts • Arithmetic operators + * / = • Input/Output/Store Data Variables • Selection IF/ELIF/ELSE • Iterations FOR/COUNT • Functions
Summer	**Topic:** Online Safety **Fertile Q:** To what extent is the online world more dangerous than the offline world? **Content:** • E-safety videos • Cyberbullying • Text bullying • Online security • Multimedia Moviemaker project	**Topic**: Building a Webpage **Fertile Q**: How will the internet help companies spread their products? **Content:** • Internet Vs WWW • Design consideration • HTML Tags • Images • CSS • JavaScript • Web design project	**Topic:** Database **Fertile Q**: What is stored in Facebook's database? **Content:** • Data Types • Table Design • Form Design • Queries • Reports • Database project

Keystage 4

Many students choose to study Computer Science for GCSE.

This three-unit course is an excellent opportunity to investigate how computers work and how they're used, and to develop computer programming and problem-solving skills. The course will allow students to focus on the Computer Science strand of Computing, where they will learn how to solve real-life problems by breaking them down into manageable components. Throughout the course, students develop a skillset that is useful in literally every other discipline.

The course covers algorithm, programming, software and hardware.

It is assessed by two written exams worth 40% of the final mark each, and a programming project which students work on over 20 hours, worth 20% of the final mark.

Students follow the OCR GCSE exam specification. You can find full details here:

http://ocr.org.uk/Images/225975-specification-accredited-gcse-computer-science-j276.pdf

Below is an outline of what is taught.

	Year 10	**Year 11**
	Fertile Q: What's the journey from clicking keyboard to reading it on the screen? **Content:** • System architecture • CPU and its registers • F-D-E instructions • Memory RAM/ROM/Cache/VM • Storage Media	**Fertile Q:** Can you think like a Computer? **Content:** • Computational Thinking • Searching and Sorting Algorithms • Produce Algorithm • Data Types • Validation • Programming Constructs • 1 and 2D arrays • Sub programs Functions Vs Procedures • File Handling • Testing • SQL for data
	Fertile Q: Can you penetrate the security of a network? **Content: 1:** • Wired and Wireless Network • Client Vs Peer-Peer • LAN Hardware • Internet DNS, Hosting, Cloud • Virtual Network • Network Topolgies and Protocols • Packet Switching • System Security and Attacks	**Fertile Q**: How is Data represented in Computers? **Content:** • 2 Levels Logic diagrams • Truth Tables • Converting Units • Converting Binary,Denary, Hexamdecimal numbers • Characted sets • Pixels in Images • Sampling in sound • Compressing Data • Converting Human and Machine language • IDE and its features

	Fertile Q: Are Robots taking over? **Content: 1:** • System Software and backups • Ethical, Legal, Cultural and Environmental concerns with CS technologies	EXTERNAL EVENTS