What are the fundamental concepts of computing?

We aim to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology

What topics will the pupils be studying in each year?

Year 7	Year 8	Year 9
Networks	Programming (Text based)	Programming (Context based)
Presenting information	Data manipulation	Augmented Reality
Data manipulation	Systems architecture	Data manipulation
Programming (Graphical)	Data representation	

Year 10	Year 11
Augmented Reality	Digital communications
Data manipulation	Internet of Everything (IoE)
Design tools	Systems architecture
Human Computer Interface (HCI) in everyday life	Memory and storage
Data and testing	Computer networks, connections and protocols
IT in the digital world	Network security
Cyber-security and legislation	Systems software
Algorithms	Ethical, legal, cultural and environmental impact of digital technology
Programming fundamentals	
Producing robust programs	
Boolean logic	
Programming languages and Integrated Development Environments	

Year 12	Year 13
Understand computer hardware	Understand what is meant by cyber security
Understand computer software	Understand the issues surrounding cyber security

Understand business IT systems	Understand measures used to protect against cyber security incidents
Understand employability and communication skills used in an IT environment	Understand how to manage cyber security incidents
Understand ethical and operational issues and threats to computer systems	Project management
Understand where information is held globally and how it is transmitted	Project development
Understand the styles, classification and the management of global information	
Understand the use of global information and the benefits to individuals and organisations	
Understand the legal and regulatory framework governing the storage and use of global information	
Understand the process flow of information	
Understand the principles of information security	

What key skills will the pupils develop over time?

Alongside the subject curriculum, computing also teaches students a number of key skills in line with the Millom Learner ideal:

- Determined: Students are challenged appropriately and provided with ample opportunity to display their determination to succeed
- Communicator: Students are taught how communication can and should be tailored to suit the target audience, through a range of possible channels and technologies
- Positive: Students are taught how Information Technology can be deployed to make a positive impact on lives, facilitating movement, health, communication, and interaction with technology
- Independent: Throughout KS3 we gradually remove the scaffolding that supports the students so that they are ready to independently tackle Non-Examined Assessments in KS4
- Collaborator: Computing lessons are a hive of activity. Peer assistance is crucial if we are to make the most of the time we have in the classroom
- Investigator: At KS5, students will conduct Non-Examined Assessments that require them to investigate, through various means, a real-life business scenario

How are all pupils learning in computing?

Resources are designed to be accessible by students of all abilities and needs, and continue to be adapted in line with departmental reflection and professional development.

Though curriculum time is limited, there is opportunity for all students to complete their learning on a unit-by-unit basis.

Resources have been adapted to clearly flag and employ the EEF recommendations.

How are pupils assessed in computing?

At Key Stage 3 students are being assessed on the knowledge they have gained that allows them to deploy the skills they develop. This is done through a series of skills trees that get filled in as they go.

Within GCSE Computer Science, end of top assessments produces the QLA-radar based strengths and weaknesses analysis, resulting in laser focussed homework-based intervention on a student-by-student basis. This mode of working aims to ensure that students are fully prepared for their Centre Assessments, and their terminal examination.

Within Level 2 Information Technology, two pieces of Non-Examined Assessment (NEA) are conducted, internally assessed, and externally moderated, resulting in a bank of marks worth 60% of their final grade. Centre Assessment windows are then used to fine tune knowledge through the QLA-radar based strengths and weaknesses analysis, resulting in laser focussed homework-based intervention on a student-by-student basis. This mode of working aims to ensure that students are fully prepared for their terminal external examination.

There is time available at the end of each school day for catch-up and intervention purposes.

How can pupils progress in computing?

Whilst our subject underpins almost all others, it can lead to specialist careers in fields such as:

- IT Infrastructure Technician
- Emerging Digital Technology Practitioner
- Application developer
- Data Analyst
- Digital Marketer
- Business Administrator

How can pupils enrich their knowledge and understanding computing?

Mr Higgins runs weekly enrichment sessions on tabletop gaming, Virtual Reality, and will soon be looking to launch a Girls in Computer Science Club, following on from a successful Girls in Cyber Security day out. We also regularly enter students for the Governmental Cyber Security Challenge.