Curriculum Implementation – Computer Science
Key Stage 5

Key Concepts Taught

- An understanding and ability to apply the fundamental principles and concepts of computer science, including abstraction, decomposition, logic, algorithms and data representation.
- The ability to analyse problems in computational terms through practical experience of solving such problems, including writing programs to do so.
- The capacity to think creatively, innovatively, analytically, logically and critically.
- The capacity to see relationships between different aspects of computer science.
- Mathematical skills within Computer Science.

How You Receive Feedback

- Self-assessment revisited regularly.
- Peer assessment against grade descriptors/success criteria.
- Feedback through continuous questioning in lessons.
- Practice exam question feedback assessed from exam board grade descriptors.
- Key tasks handed in and marked at least every two weeks.
- On-screen assessments providing instant feedback.

How do Lessons Link to Key Concepts

- The key concepts are divided between three components. Component One and Component Two will be delivered separately by your two teachers, though there are frequent overlaps in the content.
- In Component One ('Computer Systems') you will study the characteristics of contemporary processors, input, output and storage devices, software and software development, exchanging data, data types, data structures, algorithms and legal, moral, cultural and ethical issues.
- In Component Two ('Algorithms and Programming') you will study computational thinking, problem solving, programming and algorithms.
- At the end of Year 12 and for the first term of Year 13, you will apply skills and knowledge from Components One and Two in the creation of an independent Programming Project.

How we get Support with our Lessons

- Teacher-led demonstrations.
- Clear instructions broken into small steps to follow.
- Modelling and scaffolding.
- Working with peers.
- Exemplar materials such as previous projects.
- Extensive support resources provided on the network and on Google Classroom.

The Marlborough Science Academy
'shaping futures'

Retrieval Practice Opportunities / Supporting Ways to Help us Remember

- Regular on-screen whole-class quiz games.
- Topic tests.
- Think, pair, share.
- Knowledge organisers.

Opportunities for Literacy

- Accurate interpretation of exam questions.
- Definitions of subject specific terminology and application of vocabulary within work.

Opportunities for Numeracy

- Strong elements of logical thinking and application of key mathematical skills throughout programming tasks.
- Understanding of base-2, base-10 and base-16 counting systems, and conversions between these.
- Mathematical operations of floating point and fixed point binary numbers.
- Application of Boolean logic gate systems.

Opportunities for Oracy

- Frequent discussions – whole class, pair work.
- Students encouraged to have an opinion and share ideas.
- Students to lead instruction of whole class or small groups on practical tasks.

Opportunities for Character Education

- Working as part of a team and listening to each other's views.
- Deciding outcomes in groups and pairs.
- Resilience – not giving up.

Opportunities for SMSC

- Digital literacy provides opportunities for students to develop understanding in areas including:
  - Online safety
  - Digital citizenship
  - Digital footprints
  - Cyber crime
  - Artificial Intelligence
  - Economic and environmental impacts of technology

Opportunities for Assessing Learning

- Linking learning – what we did last lesson, this lesson and next lesson.
- Plenaries to reflect on learning.
- Quizzes.
- Questioning.
- Exam practice.
- End of unit assessments.
- Pre-Public Examinations.