Curriculum Implementation – Computer Science
Key Stage 4

Key Concepts Taught

- Understand and apply the fundamental principles and concepts of Computer Science, including abstraction, decomposition, logic, algorithms, and data representation
- Analyse problems in computational terms through practical experience of solving such problems, including designing, writing and debugging programs.
- Think creatively, innovatively, analytically, logically and critically.
- Understand the components that make up digital systems, and how they communicate with one another and with other systems.
- Understand the impacts of digital technology to the individual and to wider society.
- Apply mathematical skills relevant to 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.
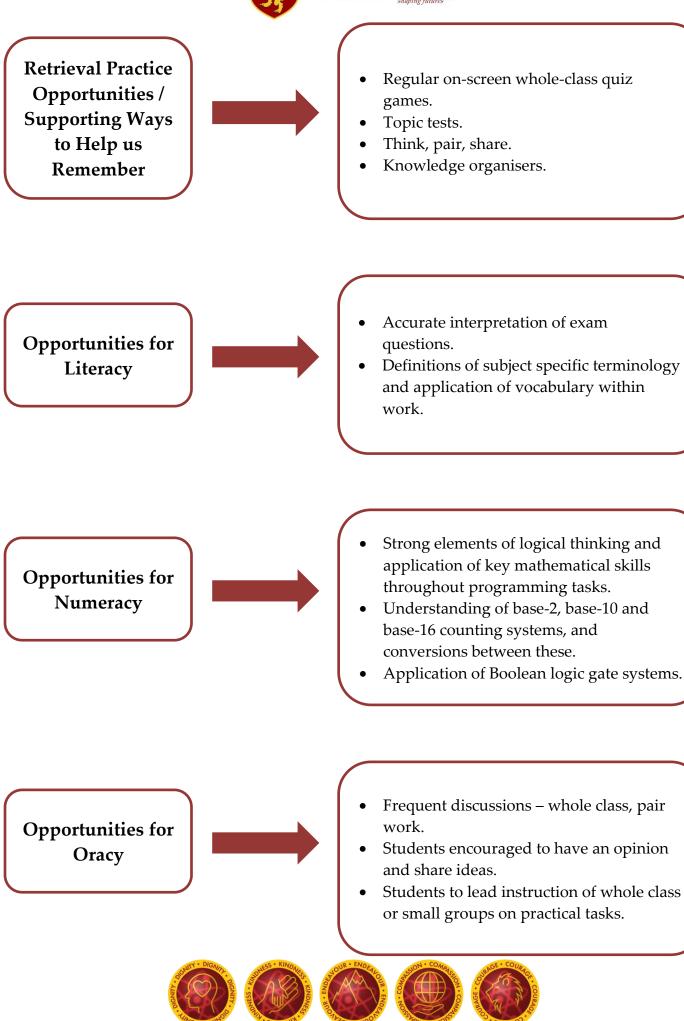
How do Lessons Link to Key Concepts

- Year 9 focuses on development of skills in analysing problems in computational terms and creating practical solutions to these problems through the creation of algorithms and programming.
- In Year 10 students will apply their problem-solving skills with increasing levels of independence to solve increasingly challenging problems. They will also work on developing their understanding of the components of digital systems and of the impacts of technology.
- In Year 11, students will apply demonstrate their practical skills through a programming project. They will complete their understanding of the theory elements of the course by studying data representation, before turning their attention to preparations for the final exams.

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.

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.
- 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.

The Marlborough Science Academy
'shaping futures'

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.