



ST MARY'S RC HIGH

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Subject Statement for Computer Science at St Mary's RC High School

Context

There is one full-time Computer Science teacher who teaches all KS4 lessons and the majority of KS3 lessons. They are supported at KS3 by experienced non-specialist teachers. There are two classrooms dedicated mostly to Computer Science lessons and one additional room available for other curriculum areas. The school has a dedicated IT support team with two members of staff including an IT network manager.

Curriculum

Our ambition is to ensure that all pupils develop core computing, ICT and digital literacy skills as well as improving their resilience, curiosity and problem-solving skills.

The scheme of work for all year groups is reviewed regularly to ensure that it meets ever-changing developments within Computer Science and provides a structured learning experience to ensure all pupils have the opportunity to study GCSE computer science should they wish. In Key Stage 3 pupils have 1 hour of computer science every week. In Key Stage 4 this extends to 5 hours over a two-week timetable.

The KS3 curriculum has been developed to ensure pupils develop key ICT skills, computational thinking skills and have a solid baseline knowledge for GCSE. In addition to this they are introduced to topics which are not assessed on the GCSE course, such as animation using Blender, to make them aware of career opportunities that are available to them.

At Key Stage 4 Computer Science pupils study OCR J277 Computer Science. The key elements of this course are to:

- Understand more deeply fundamental Computer Science concepts, e.g. abstraction, decomposition, logic, algorithms, and data representation;
- Analyse problems in computational terms by practically solving such problems, including designing, writing and debugging programs;
- Learn to think creatively, innovatively, analytically, logically and critically understand the components that make up digital systems; and will
- Understand the impacts of digital technology to the individual and to wider society and apply mathematical skills relevant to computer science.

Progress across both key stages is mapped visually on the diagrams below.

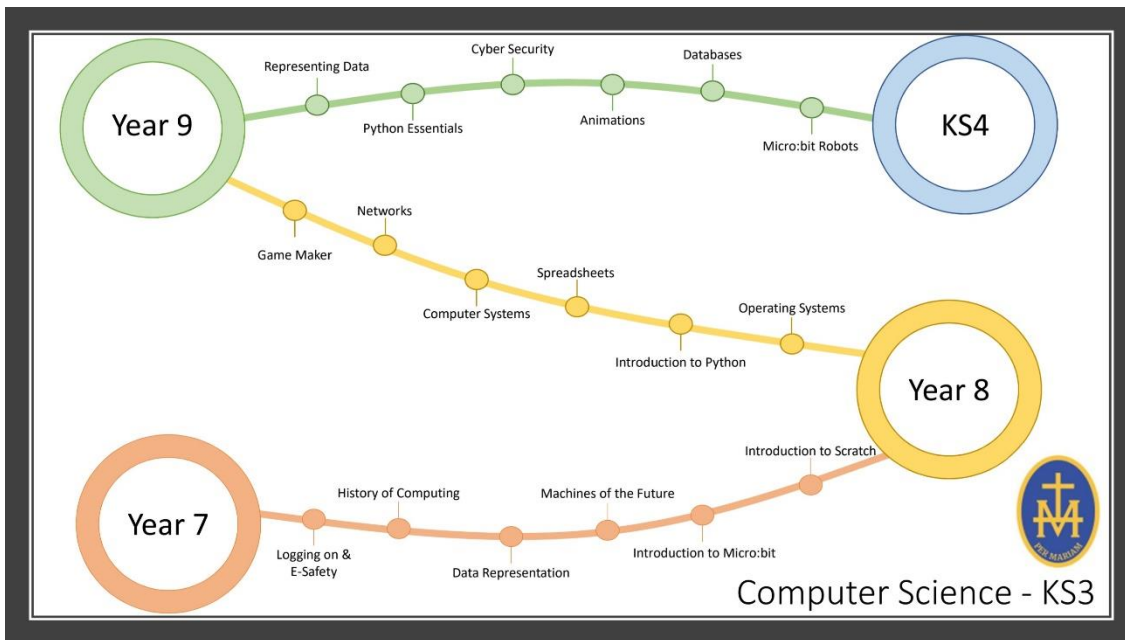


Figure 1 - Key Stage 3 Learning Journey

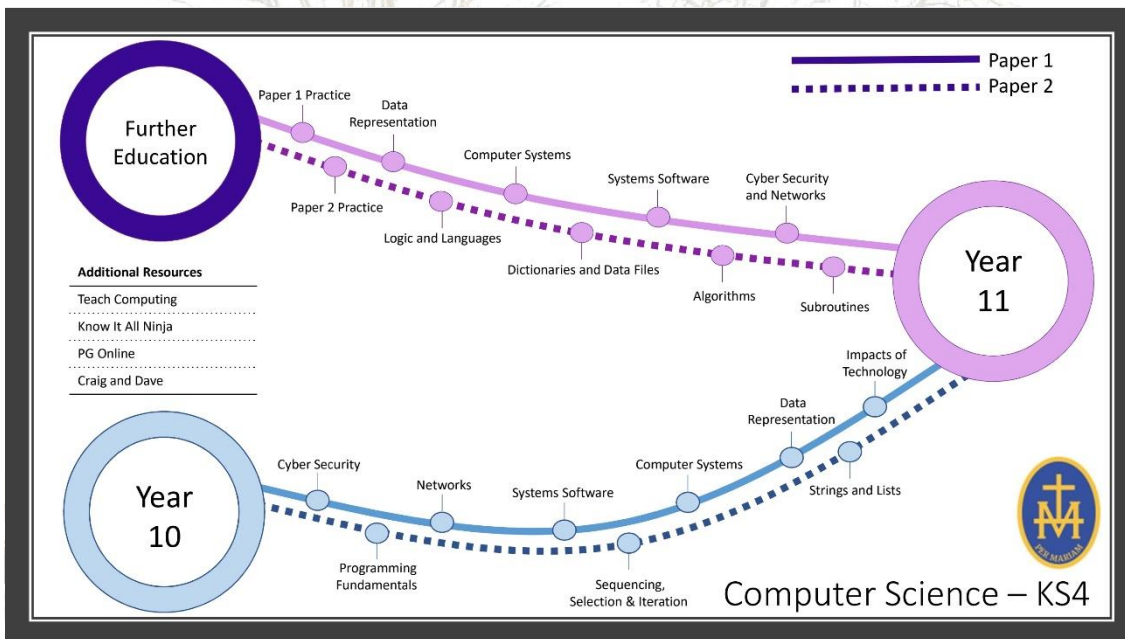


Figure 2 - Key Stage 4 Learning Journey

To ensure long-term retention of knowledge a spiral curriculum is used to build knowledge by revisiting prior learning. We use responsive teaching, questioning, knowledge-based assessments, deliberate and guided practice to check student understanding. Resources are selected to support, assess, develop and consolidate knowledge and skills to facilitate progression.

Assessment in computer science takes many forms:

- At KS3, termly assessments are taken by all pupils.
- KS4 assessment consists of exam style questions taken from past papers. All exam-style written assessments are modelled on GCSE questions from past and current exam papers and use exam board marks schemes. KS4 pupils also use Know It All Ninja for instant assessment and feedback.
- Within the department, teachers are expected to carry out formative assessment, or live marking, which enables teachers and pupils to discuss particular issues and for teachers to offer specific feedback which can be acted on immediately.
- Formative assessment also takes the form of homework, using Educake, and quick quizzes. These enable pupils to consolidate their learning and demonstrate their understanding of particular topics.

Pupils progress is tracked using formal/informal assessments of facts/keywords, and end-of-unit tests.

Approaches to Pedagogy

Throughout the curriculum a wide range of pedagogies are implemented. Coding lessons include PRIMM, Parsons Problems and live modelling to support pupils of all levels. This teaches the pupils to read and understand code before they are expected to code independently. Theory lessons are designed to start with teacher led discussion, introducing new ideas to pupils, which then develops into student led learning. Pupils are given the opportunity to explore and deepen their understanding of these concepts and present them in a way which works best for them individually.

Each year pupils take part in project based learning. This is a 6 week long project which covers key software development stages (analysis, design, implementation, testing, and evaluation) and allows pupils to be creative with their designs and programs within the project guidelines.

The curriculum implements physical computing using Microbits and Kitronik robots. This supports program comprehension by providing physical clues to a programs purpose.

Enrichment

The world of technology and career opportunities within the computing sector is incredibly vast. It is not possible to cover all these areas within lessons therefore additional clubs are run to support pupils and give them the opportunity to develop their interests further, which are open to all pupils. We are currently running a Blender club which has 10 pupils attending, a KS3 coding club with 17 pupils, and 3 KS3 pupils who are exploring Sketchup. We have collaborated with a local school and taken year 7 pupils to a CyberFirst Trailblazers event which was enjoyed by the pupils who attended.