Computer Science Department Curriculum Statement



Intent

The aims of the Computer Science Department are to :

- develop, maintain and stimulate students' curiosity, interest and enjoyment in computer science
- To teach all KS3 pupils how to think computationally and to apply this to solving coding problems. We desire that pupils who move into KS4 feel sufficiently empowered and resilient that they can address the most complex of GCSE algorithm problems with confidence and strong ability.
- To give all pupils opportunities to explore the ethical, legal and cultural implications of the use of computing in contemporary society.
- To offer challenges to pupils to explore the potential of computer science in an open minded yet principled manner.
- To teach KS3 the fundamentals of operating systems and networks.
- To encourage pupils at all key stages to explore the potential of computer science as a career choice and to discover the joy that can be found in coding.
- To encourage the take up of computer science by women.
- For students to be self-sufficient in solving their problems
- develop students familiarity with appropriate computer science concepts, principles, methods and vocabulary.
- encourage students to develop personal qualities such as politeness, perseverance, resilience, initiative, self confidence and independence.
- independently and collaboratively extend their understanding of computer science.

All students will have the opportunity to study computer science in the sixth form at various levels:

• Analysis and Approaches HL for those students who have very strong computational and algorithmic skills; who enjoy spending time with computing problems and get pleasure and satisfaction from solving challenging problems. Many of these students are likely to go on to post sixth form study or work in a computational environment.

Implementation

a) Content & Skills

The design of the KS3 curriculum will allow for skills and knowledge learnt in one year to be revisited in subsequent years: so that general principles of computing taught throughout year 7 are developed in years 8 and 9 and embedded to a more depth manner. This will allow for understanding of their potential and how they might be applied to a problem, to be fully embedded.

The department's schemes of work will be developed to show a planned sequence and progression of topics and computational skills. Pupils will learn a sequence of programming languages. In year 7, Scratch programming will be used initially to establish some fundamental paradigms of programming. HTML and CSS will be also taught to the year 7 pupils as an introduction of lingual coding languages. Later in the year they will be made familiar with Small Basic coding. This will prepare them for programming in Visual Basic in later years. The use of the same paradigms, that were first introduced in Scratch, will be highlighted as they appear in these more sophisticated languages. Year 8 will be used primarily to allow pupils to fully understand basic programming structures. The pupils will use Visual Basic and have the opportunity to embed understanding of how these paradigms can be combined to solve more complex programming challenges. They will also learn some fundamental computational theory: the roles of the operating system and networking.

There will be targeted units on computing theory at KS3, especially on the topics of Networking and Operating Systems.

The KS3 diploma project brief will be made as open as possible.

There will be several after school clubs; especially one targeted at girls..

Learning environment

Years 7, 8 and 9 have 50 minutes learning per week, Years 10-11 have 2 hr 30 minutes learning per week, Year 12-13 have 4 hours 10 minute learning per week,

Homework is an important part of learning and is used to reinforce and practice concepts, skills and knowledge learned in class. It is also used on occasions for students to research in preparation for the next lesson. KS3 classes are set homework once every two weeks and KS4 classes are set a weekly homework. Homework for KS5 reflects the need to allow pupils to create the internal assessment project; but will also be used to embed programming skills and theoretical understanding.

b) Assessment & Feedback

Assessments for KS3 will be based on in class assignments and homeworks. Pupils will be given annual summative assessment and three formative assessment projects each year. The diploma project in year 7 will form one of their assessment opportunities; while in year 9 one of the formative assessment opportunities will be in the form of group work.

Apart from regular homeworks, and coding projects, assessment at KS4 and KS5 is supplemented by formal mock exams held biannually.

Students receive written and verbal feedback on a regular basis indicating what they need to do improve

c) Monitoring

Student progress is monitored in a variety of ways:

- Results of formal assessments are recorded in a central spreadsheet.
- Report grades are analysed termly to identify student progress

- Learning walks and lesson observations are carried out by the head of department to monitor quality of teaching and learning
- Work scrutiny is carried out throughout the year.

Impact

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By the time pupils reach KS4 we want them to be utterly comfortable in using a text-based coding language.

Pupils will have the capability and the resilience that comes with that, to know how to solve their coding problems independently.

Pupils will demonstrate an excitement about the potential of computer science by choosing personal coding challenges at KS5 that stretch their capabilities.