Intent Our KS4 Computer Science curriculum prepares students for their OCR GCSE in Computer Science, and for sixth form, apprenticeship or a further training programme. It aims to develop students’ knowledge of computer technology and their ability to understand and apply computational thinking strategies in analysing and solving computing problems. It develops logical reasoning, critical thinking, analytical skills and creativity. At the end of KS4 our students will be ready for A level studies in Computer Science and for entry into apprenticeship and training positions in Computing. Meeting our local need: Bulmershe School is lucky to be situated close to the Thames Valley Park, the “Silicon Valley” of the United Kingdom. As a department, we have a good link with Oracle Technology and Microsoft Inc., both with office complexes at Thames Valley Park. Our students have opportunities for learning and work experience at computing companies in Thames Valley Park. It is our aim to build and expand these relationships for the benefit of our students. Our links with local companies affords students the opportunity to see a clear link between our courses and careers. In particular, the Kids Who Code program of Oracle Technology has been beneficial in encouraging greater enrolment of our students (especially girls) in Computer Science. Implementation Our KS4 Computer Science course teaches students the fundamentals of Computing and programming. Units of work include: Fundamentals and mechanisms of algorithms, including searching and sorting algorithms Data types and data structure Binary, decimal and hexadecimal numbers and data representation Functions and types of software Computer architecture Computer networks Cyber security Programming in Python Our KS4 Computer Science is delivered from year 10 through to year 11. In year 10, students do two hours of Python programming every fortnight for the entire year. This gives us the opportunity to teach the concepts, mainly through experimentation and guided discovery, and gives the students enough time to consolidate their learning by applying the skills learned in solving problems under various scenarios. The students complete at least one past GCSE programming project. By the end of year 10, the students become fully ready to learn the fundamentals and mechanisms of algorithms in year 11. In year 10 too, students spend three hours every fortnight learning about computer architecture, networks, logic and languages, data representation and systems software. In year 11, in addition to the algorithms unit of work, students complete their mandatory GCSE programming project and the remaining theory contents of the OCR Computer Science syllabus; culminating in carefully planned revision lessons. Our revision regime is rigorous, requiring students to study and revise both at home and in lesson, completing mastery learning worksheets and past papers and reviewing their work. Adaptability to Online Learning Our KS4 Computer Science lessons are fully teachable online, requiring no additional software or hardware beside a Windows OS computer, laptop or tablet that has Google Chrome installed on it. Our KS4 curriculum adopts a learning-by-doing approach in the sense that we spend less than 30% of lesson time on teacher-student interaction and a minimum of 70% on students producing work. The work students do enable them to discover knowledge for themselves, consolidate their learning and achieve a sense of fulfilment in their learning. Ensuring that students spend a minimum of 70% of their lesson time in producing work maintains their attention and engagement, whether they are in a classroom or at home. Students do not need to buy proprietary software for our KS4 Computer Science lessons to work from home. We only use free and trusted software in addition to apps that come with our Google subscription. For example, we use IDLE, a free and trusted software, for all our programming lessons. From year 10 through year 11, students can open their work in Google apps such as docs, sheets and slides. Impact At KS4, our students enjoy learning, develop the right learning habits, progressively become drivers of their own learning agendas and achieve excellent results in terms of academic success. Progress and attainment of our GCSE and A-Level students, in relation to the starting points of students, have been very good.