Westcliff High School for Boys
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Careers across the curriculum
in COMPUTER SCIENCE

Soft Skills Development (these are the skills we are committed to developing in the Careers Department)	
All Years	We develop **communication and teamwork** through paired programming activities, including programming Micro: bit controlled robots. Lessons also include group presentation tasks and structured peer assessment opportunities, encouraging students to discuss solutions, explain technical concepts and provide constructive feedback.
Years 8, 9, Middle School and Sixth Form	We develop **time management** skills through staged programming projects across Key Stages 3 and 4. Students are encouraged to plan their work carefully before beginning to code, with formal program planning introduced in Year 9. At A Level, students complete a substantial Non-Exam Assessment (NEA) over approximately five months, managing multiple checkpoint deadlines and independently organising their workload.
Year 9, Middle School and Sixth Form	We develop **creative thinking** by designing their own Scratch games in Year 7, creating websites in Year 8 and tackling increasingly open-ended programming challenges from Year 9 onwards. At GCSE and A Level, students have opportunities to develop independent programming projects and design graphical user interfaces using Pygame.
In Middle School	We develop **problem solving** by pupils regularly tackling programming challenges that encourage them to develop their own solutions rather than simply following prescribed methods. Logic puzzles are used to promote computational thinking, while competitions such as the Bebras Challenge provide opportunities to apply problem-solving skills in unfamiliar contexts. Pupils are supported with worked examples and guidance before independently applying their knowledge.
In Sixth Form	We develop **networking** through taking part in a wide range of competitions, both national and international. Sixth form students have the opportunity to become Subject Prefects. Subject Prefects are expected to attend Open Evenings and talk to prospective pupils and their parents about their experience of the subject. They are also expected to help with running the department's many lunchtime clubs and activities demonstrating leadership. In addition, most years we will have a guest speaker, often a returning student, come and talk about their experience at university or in the workplace which is always appreciated by current students.

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Development of Subject Specific Skills which are Relevant to Next Steps / the Workplace

Over the course of their time at Westcliff High School for Boys, students will have a range of opportunities to develop key skills for use in the workplace.

In Year 7, pupils have the opportunity to work together to program Micro: bit controlled cars but are also encouraged to support each other with their wider learning in lessons. Time is always a precious commodity in the classroom, so pupils are given guidance as to how to manage their time accordingly.

From Year 7 to 9, one of the main areas of focus is developing programming skills. This goes beyond simply learning the syntax of a programming language, as we also teach a range of critical thinking skills and how to systematically approach problem solving. We cover how to use decomposition and abstraction to break a problem down into solvable chunks, along with equipping them with a range of techniques that can then be adapted and applied. By the end of Year 9, pupils will have this mental toolset ready to prepare them for GCSE and beyond. The competitions listed below also all help with this.

Years 10 and 11 see a greater emphasis on creative thinking; once a problem has been identified it takes a bit of creativity to decide on ways to potentially solve it, along with judgement from experience to know the best way to move forward. Though these skills are taught primarily through programming challenges, they invariably have real world context, and the same problem-solving process can be applied to wider systems applicable in the workplace, not just producing programs. The Perse Coding Challenge primarily taken by Years 10 and 11 really helps with developing teamwork and communication all under significant time constraints. Beyond this, we also study the very nature of the technology behind modern communication, how networks are organised and even the protocols that make the internet possible allowing real-time communication across the planet!

Sixth Form sees greater mastery of these skills with ever increasingly difficult problems needing to be solved, as well as further refinement of the computational thinking mental toolkit to do this. There is also an expectation that students take up opportunities to lead and present to others. Through shared tasks, group presentations, competitions, Open Evenings and leading clubs, students are encouraged to actively lead rather than simply follow instructions and prepare for examinations. By the time students leave Westcliff High School for Boys, they will have spent a significant amount of time developing these core skills in a way that can be applied beyond the subject and will be invaluable as they enter the workplace.

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Extra-curricular Opportunities	
Bebras Competition	All computing students across all year groups take part in the age-appropriate level of the challenge. Round 1 is focussed on problem solving skills and computational thinking; these are key skills sought by employers. Round 2 progresses to using code to solve specific problems, putting problem solving skills into practice.
Perse Coding Team Challenge	Years 9 to 11 Computer Science students can take part in this programming challenge where students have to solve a number of problems using code within a set time limit. Round 1 has students working in pairs developing their teamwork skills to write code on a single computer. Round 2 progresses to students being regrouped into groups of three, working beside each other on different machines; this requires teams to split the tasks between themselves in order to optimise results. This is an excellent opportunity for students to work supportively in a team whilst still balancing their own outcomes.
British Algorithmic Olympiad	This Sixth Form activity involves students using programming to solve three separate mathematical themed problems in a two-hour window. The tasks are challenging and push students to the limits of their coding skills, whilst applying their mathematical understanding to unique problems. It relies on a mix of skill and creativity along with an ability to work under significant time constraints. Combining knowledge, skills and creativity all under significant time pressure will help students stand out in the most demanding of working environments.
British Informatics Olympiad	Much like the Algorithmic Olympiad, this is another very challenging Sixth Form competition pushing students to produce high quality, effective code under significant time constraints. With a focus on computing problems, this is an opportunity for the best programmers to demonstrate their skills. In the current competitive programmer employment market, employers are always looking for the best recruits and tasks similar to these are often used as part of the recruitment process letting the most able stand out from their peers.

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Scratch Club	Once a week Sixth Form Subject Prefects support Year 7 and 8 pupils develop their passion for Computer Science through the creation of their own programs using the Scratch drag and drop programming language. The club encourages creativity, peer support and collaboration between pupils not just individual development.
Coding Club	Again some of the Sixth Form Subject Prefects spend a lunchtime each week supporting students from Year 8 to Year 11 to develop their python programming skills alongside and beyond the curriculum. Pupils are encouraged to work on their own projects and ideas but are given the option of working through some set activities, all the time receiving mentoring from the Sixth Form. This is beneficial to both those developing their skills as programmers and the Sixth Formers developing their mentoring skills.
Termly lunchtime clubs	The Sixth Form Subject Prefects run lunchtime clubs most days of the week coving a wide range of computing related topics. The Prefects choose to run clubs on subjects they find interesting sharing their knowledge and leading the activities. Over the years, this has varied greatly from Cyber Security, Linux, the Mathematics behind AI, Animation Society, Project Euler tasks and many others. This gives the Prefects free scope to develop their planning and leadership whilst modelling this to lower year groups.