Key Stage 4 Curriculum

Computer Science

In Year 10 Students will study:

THE WINSFORD ACADEMY

	Winter Term			Spring Term				Summer Term			
	Half Term 1	Half Term 2		Half Term 3		Half Term 4		Half Term 5		Half Term 6	
	Week A	Week A	Week B	Week A	Week B	Week A	Week B	Week A	Week B	Week A	Week B
Title	**1.1 - Systems Architecture 1.2 - Memory and Storage**	**1.3 - Computer Networks, Connections and Protocols**	**2.2 - Programming Fundamentals – Part 1**	**1.4 - Network Security 1.5 - System Software**	**2.2 - Programming Fundamentals – Part 2**	**1.6 - Ethical, Legal, & Cultural Impacts**	**2.2 - Programming Fundamentals – Part 3**	**2.1 - Algorithms**	**2.2 - Programming Fundamentals – Part 4**	**2.3 – Robust Programming 2.4 – Boolean Logic 2.5 – Programming Languages and IDEs**	**2.2 - Advanced Programming**
Content	The aim of unit 1.1 is to provide key knowledge in the main component of the computer, the CPU. Looking at von Neumann architecture and how to improve performance The aim of unit 1,2 is to provide knowledge of both primary memory and secondary storage, looking at the purposes, uses and benefits of each. It also provides knowledge and skills in the use of different number systems utilised by computers, and the use of binary to represent images, text and audio.	The aim of unit 1.3 is to provide knowledge and skills of the types of networks and topologies commonly in use, including the structure of the internet. It also provides knowledge in the use of wired and wireless connections, encryption methods, addressing and protocols used by computers with networks	The aim of this section of unit 2.2 is to introduce Python as the programmin g language of choice. The foci of the lessons cover the use of variables, sequence of programs, Boolean logic and use with selection	The aim of unit 1.4 is to provide knowledge and skills in the threats to networks and computers and identifying and preventing vulnerabiliti es The aim of unit 1.5 is to provide knowledge in the software used by computers (OS and utility programs)	The aim of this section of unit 2.2 is to introduce character manipulatio n, and iteration. There will be testing of the learning undertaken	The aim of unit 1.6 is to provide an overview of the impacts that computer science has had on society, looking at how people interact with computers, privacy, and legislation surrounding the use of computer systems	The aim of this section of unit 2.2 is to introduce the use of arrays and external files with Python programs	The aim of unit 2.1 is to build learners' confidence and knowledge in computation -al thinking. The main concepts covered include the use of flowcharts, pseudocode, trace tables and searching / sorting algorithms	The aim of this section of unit 2.2 is to introduce the use of procedures and function, as well as regular expressions. There will be testing of the learning undertaken	The aim of unit 2.3 is to look at how programs are created to ensure that they are maintainable by other people, and to prevent their abuse by use of validation and verification techniques The aim of unit 2.4 is to make the pupils aware of Boolean logic gates and their associated truth tables, and how these combine to form circuits The aim of unit 2.5 is to explore the range of programming languages in use, and look at how programs are developed and ran on computers from the integrated development environments	The aim of this section of unit 2.2 is to introduce pupils to other aspects, such as SQL, the use of HTML / CSS / JS, and low level language use
National Curriculum Elements	develop their capability, creativity and knowledge in computer science, digital media and information technology understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to report a range of concerns develop and apply their analytic, problem-solving, design, and computational thinking skills										

Homework	2 pieces of multiple-choice questions to check understanding of concepts taught	2 pieces of multiple-choice questions to check understanding of concepts taught	2 pieces of multiple-choice questions to check understanding of concepts taught	2 pieces of multiple-choice questions to check understanding of concepts taught	2 pieces of multiple-choice questions to check understanding of concepts taught	2 pieces of multiple-choice questions to check understanding of concepts taught
Cultural Capital	Technical – marketable skills (use of internet and IT equipment) Emotional – empathy (effects of e-bullying, etc.)	Technical – marketable skills (use of productivity software) Emotional – empathy (effects of e-bullying, etc.)	Technical – marketable skills (knowledge of IT equipment)	Technical – marketable skills (use of systems) Emotional – empathy (effects of e-bullying, etc.) Subcultural – legislative knowledge of computer misuse	Technical – marketable skills (problem solving techniques)	Technical – marketable skills (basic programming)
Assessment	Use of lesson re-cap to re-enforce knowledge at end of lessons and start of subsequent lessons Assessment of knowledge by testing and extended writing piece	Use of lesson re-cap to re-enforce knowledge at end of lessons and start of subsequent lessons Assessment of knowledge by testing and self-assessment of project Assessment of knowledge by testing / completion of programming tasks	Use of lesson re-cap to re-enforce knowledge at end of lessons and start of subsequent lessons Assessment of knowledge by testing and extended writing piece Assessment of knowledge by testing / completion of programming tasks	Use of lesson re-cap to re-enforce knowledge at end of lessons and start of subsequent lessons Assessment of knowledge by testing and self-assessment of work done in unit Assessment of knowledge by testing / completion of programming tasks	Use of lesson re-cap to re-enforce knowledge at end of lessons and start of subsequent lessons Assessment of knowledge by testing / completion of programming tasks	Use of lesson re-cap to re-enforce knowledge at end of lessons and start of subsequent lessons Assessment of knowledge by testing / completion of programming tasks

In Year 11 Students will study:

	Winter Term		Spring Term		Summer Term	
	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
	Programming review	Programming Project	Revision	Revision	Revision	
Content	The aim of the unit is to refresh programming knowledge that may have been lost over the summer period	A requirement of the course is that a project is completed that consists of at least 20 hours of programming. This is a teacher-led project and gives experience of programming to solve a real-life scenario.	This unit takes learners into revision mode prior to the examination series.	This unit takes learners into revision mode prior to the examination series.	This unit takes learners into revision mode prior to the examination series.	
National Curriculum Elements	develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to report a range of concerns	develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills	develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to report a range of concerns	develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to report a range of concerns	develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to report a range of concerns	
Homework	2 pieces of written homework to check understanding of concept taught	2 pieces of multiple-choice questions to check understanding of concepts taught	2 pieces of multiple-choice questions to check understanding of concepts taught	2 pieces of multiple-choice questions to check understanding of concepts taught	Multiple-choice questions to check understanding and recall of concepts taught	

Cultural Capital	Technical – marketable skills (programming design skills and problem-solving techniques)	Technical – marketable skills (programming to solve a real-world problem) Objective – work of art (program as a work of art and for their content, elegance, etc.)				
How you will be assessed	Use of lesson re-cap to re-enforce knowledge at end of lessons and start of subsequent lessons Assessment of knowledge by testing and completion of programming tasks	Use of lesson re-cap to re-enforce knowledge at end of lessons and start of subsequent lessons Assessment of knowledge by testing and extended writing piece	Use of lesson re-cap to re-enforce knowledge at end of lessons and start of subsequent lessons Assessment of knowledge by testing and extended writing piece	Use of lesson re-cap to re-enforce knowledge at end of lessons and start of subsequent lessons Assessment of knowledge by testing and extended writing piece	Use of lesson re-cap to re-enforce knowledge at end of lessons and start of subsequent lessons Assessment of knowledge by testing and past papers	