Computing at Cox Green
Curriculum Plan

Key Stage 4
Year 9

Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Algorithms **1.1 Systems Architecture**	**Programming** **1.2 Memory** **1.3 Storage**	**Programming** **1.2 Memory** **1.3 Storage**	**Programming** **Programming techniques**	**1.7 Systems software** **1.8 Ethical, legal, cultural and environmental concerns**	
Classroom Theory • **the purpose of the CPU** • **Von Neumann architecture:** MAR (Memory Address Register) MDR (Memory Data Register) Program Counter Accumulator • **common CPU components and their function:** ALU (Arithmetic Logic Unit) CU (Control Unit) Cache • **the function of the CPU as fetch and execute instructions stored in memory** • **how common characteristics of CPUs affect their**	Software: • the difference between RAM and ROM • the purpose of ROM in a computer system • the purpose of RAM in a computer system • the need for virtual memory • flash memory. Storage the need for secondary storage • data capacity and calculation of data capacity requirements • common types of storage: ◯ optical ◯ magnetic ◯ solid state • suitable storage devices and storage media for a given application, and the advantages and	Software: Various, Python Students will understand the purpose and functionality of systems software • operating systems: ◯ user interface ◯ memory management/multitasking ◯ peripheral management and drivers ◯ user management ◯ file management • utility system software: ◯ encryption software ◯ defragmentation ◯ data compression ◯ the role and methods of backup: n full n incremental. • Produce algorithms in	Software: BYOB. Design and create a computer game for a given audience. Use Algorithms to create the game Plan game and different outcomes Recognise the different users and difficulty. Purpose of solution Description of Target audience. Description of solution Sketch (diagram, storyboard, mind map) Sources of information. Discuss how various features of hardware and software are to be used to create one solution. How will the solution make things better e.g.	Students will describe the elements of a computer system and the importance of computers in the modern world. The need for reliability and adherence to professional standards is covered, as well as ethical, environmental and legal considerations when creating computer systems. Students can define a computer system as consisting of hardware, software and often, communications technology • define the basic elements of a computer system as input, processing, storage and output • justify the use of particular input and output devices in a particular computer system • explain clearly the need for and benefits of professional standards in computing • the purpose and functionality of systems software • operating systems: ◯ user interface ◯ memory management/multitasking ◯ peripheral management and drivers ◯ user management ◯ file management • utility system software:	

performance: clock speed cache size number of cores • **embedded systems:** purpose of embedded systems examples of embedded systems • Understand and use sequence, selection and iteration in an algorithm • Define and use the terms variable and constant as used in an imperative language • Describe the data types integer, real, Boolean, character and string • Describe syntax errors and logic errors which may occur while developing a program • Explain what algorithms do (in pseudocode or diagrams) and correct or complete them	disadvantages of these, using characteristics: ◯ capacity ◯ speed ◯ portability ◯ durability ◯ reliability ◯ cost. • Explain the need for translators to convert high level code to machine code • Select and justify appropriate data types for a given program • Perform common operations on numeric and Boolean data • Understand and identify syntax and logic errors • Describe the common tools and facilities available in an integrated development environment (IDE): editors, error diagnostics, run-time environment, translators, auto-documentation	pseudocode or flow diagrams to solve problems • Use one-dimensional arrays • Select and justify test data for a program, stating the expected outcome of each test	improve efficiency Know the effect of the scope of a variable e.g. a local variable can't be accessed from outside its function. Skills: Numeracy, Programming. Sequencing, Problem solving Assessment Students will sit an end-of-unit test, consisting of questions similar to those that students will face on the GCSE exam paper. The test will cover the topics in this unit and can be completed in one lesson.	◯ encryption software ◯ defragmentation ◯ data compression ◯ the role and methods of backup: n full n incremental. • how to investigate and discuss Computer Science technologies while considering: ◯ ethical issues ◯ legal issues ◯ cultural issues ◯ environmental issues. ◯ privacy issues. • how key stakeholders are affected by technologies • environmental impact of Computer Science • cultural implications of Computer Science • open source vs proprietary software • legislation relevant to Computer Science: ◯ The Data Protection Act 1998 ◯ Computer Misuse Act 1990 ◯ Copyright Designs and Patents Act 1988 ◯ Creative Commons Licensing ◯ Freedom of Information Act 2000. Extension work (L8) Know the ethical issues surrounding the application of information technology, an existence of legal frameworks governing its use e.g. Data Protection Act, Computer Misuse Copyright etc. Assessment Students will sit an end-of-unit test. These are not live assessment questions. They are created from scratch for this scheme of work. When producing the test the following have been carefully taken into account:

• Explain the difference between high level code and machine code Assessment: Exam board assessment material Students will sit an end-of-unit test worth 40 marks, consisting of questions similar to those that students will face on the GCSE exam paper. The test will cover the topics in this unit and can be completed in one lesson. Evaluation of their work against the criteria. Explanation of the law of copyright. Skills: Graphics editing Vocabulary: Algorithm, flowchart, flow diagram, pseudocode, sequence, selection, iteration, condition,	Assessment: Exam board assessment material Skills: Numeracy, Programming. Sequencing, Problem solving *SMSC/ British Values:* *Effects of ICT on society.*	*SMSC/ British Values:* *Effects of ICT on society.*	*SMSC/ British Values:* *Effects of ICT on society.* *Investigating moral values and ethical issues.* *Copyright Laws: DPA* *Computer Misuse Act.* *Respect.* *Explain the effects on society of gaming.*	• the range of questions is designed to elicit the understanding of students from 1-9 grade. • appropriate command words and language is used across the range of questions (list, describe, state, discuss, explain…) • questions worth 1, 2, 4, 6 and an extended writing 6 mark question are provided, following the rough proportions of live exam papers. Skills: Problem solving *SMSC/ British Values:* *Effects of ICT on society.* *Recognise ethical issues surrounding the application of information technology beyond school.* *Laws behind ICT and Business.* *Working with others, tolerance.*

Boolean expression, high level programming language, assembly language, assembler, mnemonic, machine code, translator, interpreter, compiler, source code, object code *SMSC/ British Values: Investigating moral values and ethical issues. Identify and explain how the use of technology can impact on society. Recognise ethical issues surrounding the application of information technology beyond school.*				
Enrichment/Extra Curriculum: • *We run additional workshops to develop skills during the Computer Club and link to a number of businesses including the O2 and CISCO Challenge.*				

Computing at Cox Green
Curriculum Plan

Key Stage 4
Year 10

Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Algorithms **1.4 Systems Architecture**	**Programming** **1.5 Memory** **1.6 Storage**	**Programming** **1.4 Memory** **1.5 Storage**	**Programming** **Programming techniques**	**1.7 Systems software** **1.8 Ethical, legal, cultural and environmental concerns**	
Classroom Theory • **the purpose of the CPU** • **Von Neumann architecture:** MAR (Memory Address Register) MDR (Memory Data Register) Program Counter Accumulator • **common CPU components and their function:** ALU (Arithmetic Logic Unit) CU (Control Unit) Cache • **the function of the CPU as fetch and execute instructions stored in memory** • **how common characteristics of CPUs affect their**	Software: • the difference between RAM and ROM • the purpose of ROM in a computer system • the purpose of RAM in a computer system • the need for virtual memory • flash memory. Storage the need for secondary storage • data capacity and calculation of data capacity requirements • common types of storage: ◯ optical ◯ magnetic ◯ solid state • suitable storage devices and storage media for a given application, and the advantages and	Software: Various, Python Students will understand the purpose and functionality of systems software • operating systems: ◯ user interface ◯ memory management/multitasking ◯ peripheral management and drivers ◯ user management ◯ file management • utility system software: ◯ encryption software ◯ defragmentation ◯ data compression ◯ the role and methods of backup: n full n incremental.	Software: BYOB. Design and create a computer game for a given audience. Use Algorithms to create the game Plan game and different outcomes Recognise the different users and difficulty. Purpose of solution Description of Target audience. Description of solution Sketch (diagram, storyboard, mind map) Sources of information. Discuss how various features of hardware and software are to be used to create one solution. How will the solution make things better e.g.	Students will describe the elements of a computer system and the importance of computers in the modern world. The need for reliability and adherence to professional standards is covered, as well as ethical, environmental and legal considerations when creating computer systems. Students can define a computer system as consisting of hardware, software and often, communications technology • define the basic elements of a computer system as input, processing, storage and output • justify the use of particular input and output devices in a particular computer system • explain clearly the need for and benefits of professional standards in computing • the purpose and functionality of systems software • operating systems: ◯ user interface ◯ memory management/multitasking ◯ peripheral management and drivers ◯ user management ◯ file management	

performance: clock speed cache size number of cores • **embedded systems:** purpose of embedded systems examples of embedded systems • Understand and use sequence, selection and iteration in an algorithm • Define and use the terms variable and constant as used in an imperative language • Describe the data types integer, real, Boolean, character and string • Describe syntax errors and logic errors which may occur while developing a program • Explain what algorithms do (in pseudocode or diagrams) and correct or complete them	disadvantages of these, using characteristics: ◯ capacity ◯ speed ◯ portability ◯ durability ◯ reliability ◯ cost. • Explain the need for translators to convert high level code to machine code • Select and justify appropriate data types for a given program • Perform common operations on numeric and Boolean data • Understand and identify syntax and logic errors • Describe the common tools and facilities available in an integrated development environment (IDE): editors, error diagnostics, run-time environment, translators, auto-documentation	• Produce algorithms in pseudocode or flow diagrams to solve problems • Use one-dimensional arrays • Select and justify test data for a program, stating the expected outcome of each test	improve efficiency Know the effect of the scope of a variable e.g. a local variable can't be accessed from outside its function. Skills: Numeracy, Programming. Sequencing, Problem solving Assessment Students will sit an end-of-unit test, consisting of questions similar to those	• utility system software: ◯ encryption software ◯ defragmentation ◯ data compression ◯ the role and methods of backup: n full n incremental. • how to investigate and discuss Computer Science technologies while considering: ◯ ethical issues ◯ legal issues ◯ cultural issues ◯ environmental issues. ◯ privacy issues. • how key stakeholders are affected by technologies • environmental impact of Computer Science • cultural implications of Computer Science • open source vs proprietary software • legislation relevant to Computer Science: ◯ The Data Protection Act 1998 ◯ Computer Misuse Act 1990 ◯ Copyright Designs and Patents Act 1988 ◯ Creative Commons Licensing ◯ Freedom of Information Act 2000. Extension work (L8) Know the ethical issues surrounding the application of information technology, an existence of legal frameworks governing its use e.g. Data Protection Act, Computer Misuse Copyright etc. Assessment Students will sit an end-of-unit test. These are not live assessment questions. They are created from scratch for this scheme of work. When producing the test the following have been carefully

• Explain the difference between high level code and machine code Assessment: Exam board assessment material Students will sit an end-of-unit test worth 40 marks, consisting of questions similar to those that students will face on the GCSE exam paper. The test will cover the topics in this unit and can be completed in one lesson. Evaluation of their work against the criteria. Explanation of the law of copyright. Skills: Graphics editing Vocabulary: Algorithm, flowchart, flow diagram, pseudocode, sequence, selection, iteration, condition,	Assessment: Exam board assessment material Skills: Numeracy, Programming. Sequencing, Problem solving *SMSC/ British Values:* *Effects of ICT on society.*	Assessment Students will have to create a program for a given task. Based on past paper *SMSC/ British Values:* *Effects of ICT on society.*	that students will face on the GCSE exam paper. The test will cover the topics in this unit and can be completed in one lesson. *SMSC/ British Values:* *Effects of ICT on society.* *Investigating moral values and ethical issues.* *Copyright Laws: DPA* *Computer Misuse Act.* *Respect.* *Explain the effects on society of gaming.*	taken into account: • the range of questions is designed to elicit the understanding of students from 1-9 grade. • appropriate command words and language is used across the range of questions (list, describe, state, discuss, explain…) • questions worth 1, 2, 4, 6 and an extended writing 6 mark question are provided, following the rough proportions of live exam papers. Skills: Problem solving *SMSC/ British Values:* *Effects of ICT on society.* *Recognise ethical issues surrounding the application of information technology beyond school.* *Laws behind ICT and Business.* *Working with others, tolerance.*

Boolean expression, high level programming language, assembly language, assembler, mnemonic, machine code, translator, interpreter, compiler, source code, object code *SMSC/ British Values: Investigating moral values and ethical issues. Identify and explain how the use of technology can impact on society. Recognise ethical issues surrounding the application of information technology beyond school.*				
Enrichment/Extra Curriculum: • *We run additional workshops to develop skills during the Computer Club and link to a number of businesses including the O2 and CISCO Challenge.*				

Computing at Cox Green
Curriculum Plan

Key Stage 4
Year 11 GCSE

Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Course introduction **Unit 1 2017** **2 Systems Architecture** • **Memory** • **System software**	**3 Ethical, legal, cultural and environmental concerns**	**4 Storage** **5 Network topologies, protocols and layers**	**6 System security** **7 Wired and wireless networks**	• **Algorithms** • **Programming techniques**	• **Producing robust programs**
• **the purpose of the CPU** • **Von Neumann architecture:** MAR (Memory Address Register) MDR (Memory Data Register) Program Counter Accumulator • **common CPU components and their function:** ALU (Arithmetic Logic Unit) CU (Control Unit) Cache • **the function of the CPU as fetch and execute instructions stored in memory** • **how common characteristics of**	Storage devices Identify the difference between RAM and ROM, describing their uses in computers and mobile devices. Identify suitable uses of storage devices, stating the advantages and disadvantages of each to people and organisations.	A range of ICT tools and techniques. (3.2) Systems life cycle. Analysis, design, implementation, testing and evaluation. Describe the distinction between information and data. Need for precision in framing questions. Refine search conditions. Ensure the accuracy and plausibility of information. Data collection methods.	Working with information to solve problems. Communication. Find/ select information. Work accurately and proof read, using software facilities where appropriate Organise information to produce a poster, newsletter, web page or multimedia presentation. Produce information that is relevant and fit for purpose. How data can be transferred within and between applications.	A range of ICT tools and techniques (3.2) Operating systems and user interfaces. Describe a GUI with customisation, resolution, desktop contrast, adjust volume, set date and time e.g. GUI features Describe a Menu User Interface. Understand how encoding data in a suitable format affects file size and ease of data entry and retrieval.	Society's use of ICT (3.3) Applications software. Advantages and disadvantages of using hosted applications compared to locally installed applications. Identify the common features found in software. Identify specific features of basic graphics packages Describe specific features of spreadsheet software, that enter, develop and organise numerical information that's fit for purpose

CPUs affect their performance: clock speed cache size number of cores • **embedded systems:** purpose of embedded systems examples of embedded systems Hardware and software Know how emerging technologies affect the way in which people and organisations operate and work together. Understand how to analyse a problem and plan to create a solution to solve it. Assessment: Each unit of work is marked against KS 3 assessment criteria and students are given a level. Students will be assessed on their submitted coursework and students will also evaluate their work and respond to feedback. Analysis table	Assessment: Each unit of work is marked against KS 3 assessment criteria and students are given a level. Students will be assessed on their submitted coursework and students will also evaluate their work and respond to feedback. Evidence of Design and creating the database. *SMSC/ British Values: Investigating moral*	Assessment: Each unit of work is marked against KS 3 assessment criteria and students are given a level. Students will be assessed on their submitted coursework and students will also evaluate their work and respond to feedback. Evidence of how the work was created. *SMSC/ British Values: Investigating moral values and ethical issues.*	Assessment: Each unit of work is marked against KS 3 assessment criteria and students are given a level. Students will be assessed on their submitted coursework and students will also evaluate their work and respond to feedback. Evidence of testing against original plans and evaluation of work *SMSC/ British Values: Recognise ethical issues surrounding the*	Assessment: Each unit of work is marked against KS 3 assessment criteria and students are given a level. Students will be assessed on their submitted coursework and students will also evaluate their work and respond to feedback. Evidence of Report and evaluating others' work. *SMSC/ British Values: Recognise ethical issues surrounding the application of*	Assessment: Each unit of work is marked against KS 3 assessment criteria and students are given a level. Students will be assessed on their submitted coursework and students will also evaluate their work and respond to feedback. Final unit portfolio. *SMSC/ British Values: Effects of ICT on society.*

SMSC/ British Values: Investigating moral values and ethical issues. Working in teams.	*values and ethical issues. Recognising different user including cultures, religions and societies.*	*Identify and explain how the use of technology can impact on society.*	*application of information technology beyond school.*	*information technology beyond school.*	*Investigating moral values and ethical issues. Copyright Laws: DPA Computer Misuse Act. Respect. Explain the effects on society of gaming.*
Enrichment/Extra Curriculum: • *We run additional workshops to develop skills during the Computer Club and link to a number of businesses including the O2 and CISCO Challenge.*					