Curriculum Map 2020-2021
Subject: Computer Science

Year 10

Term	Unit of Work	Knowledge and Skills	Assessment
1	Computer Systems	This term pupils will be introduced to computer systems which delves into how a computer is built up of each component and how they work together. Pupils will learn the inner workings of the computer and how their mouse click goes to an event on the computer. The topics covered are: • Hardware and Software • Boolean logic • System architecture	**Key assessment:** • Computer Systems End of Topic Assessment • Personal Learning Checklist **Additional tasks:** • In class exam question practice • Retrieval practice • Homework – topic-based worksheets and skills application
2	Computer Systems Fundamentals of Data Representation	This term pupils will complete their learning on Computer Systems. The following topics will be covered: • Software classification • Classification of programming languages and translators On completion, pupils will continue to by exploring how computers store data. They will explore the format it takes in the memory and learn to convert data into binary. This data represents that of images, sound, text and general data and information stored on the computer. The Topics included are: • Number Bases • Converting between number bases • Units of information	**Key assessment:** • Computer Systems and Fundamentals of Data Representation End of Topic Assessment • Personal Learning Checklist **Additional tasks:** • In class exam question practice • Retrieval practice • Homework – topic-based worksheets and skills application

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3	Fundamentals of Data Representation	This term pupils will complete their learning on Computer Systems. The following topics will be covered: • Binary arithmetic • Character encoding • Representing images • Representing sound • Data Compression	**Key assessment:** • Data Representation and Algorithm End of Topic Assessment • Personal Learning Checklist **Additional tasks:** • In class exam question practice • Retrieval practice • Homework – topic-based worksheets and skills application • Exam practice
4	Fundamentals of Algorithms Programming	This term pupils will start their programming journey. Firstly, pupils will learn about decomposition and abstraction, and how algorithms are used to plan for the writing programs. The topics covered are: • Representing algorithms (Pseudocode) • Efficiency of algorithms • Searching algorithms • Sorting algorithms Pupils will be taught the programming language, Python. The learning on algorithms will feed into this learning by helping students break down complex programs, and then writing them. Pupils will develop a theoretical and practical understanding, which will enable them to develop programming skills. The topics covered are: • Data Types (integers, real, float, decimal, Boolean, string) • Variables (variables, constants, local vs global variables) • Selection (selection and nested selection) • Looping (definite and indefinite iteration) • Operations (arithmetic, relational & Boolean) • Classification of Programming Languages (high/low-level, translators)	**Key assessment:** • Algorithm and program End of Topic written assessment • Personal Learning Checklist **Additional tasks:** • In class exam question practice • Retrieval practice • Homework – topic-based worksheets and skills application • Exam practice

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		• Subroutines (modular programming, procedures, functions and parameters)	
5	Programming Build up to Y10 mocks	Pupils will continue their programming journey from term 4 and increase the depth of their theoretical and practising understanding of Python and programming. The topics covered are: • Data Structures (Arrays, Lists, Records) • File Handing (Input & Output data from file) • Robust and Secure Programming (data validation, testing) • String Manipulation • Random number generation In this term year 10 will complete mocks on what they have learned this year. Pupils will complete preparation for this in class by recapping all the above topics and practising exam technique	**Key assessment:** • Y10 mock • Personal Learning Checklist **Additional tasks:** • In class exam question practice • Retrieval practice • Homework – topic-based worksheets and skills application • Exam practice
6	Programming – a project opportunity	This term will allow students to show off their programming skills. Pupils will have the opportunity to complete a full programming project from start to finish. This will start with pupils being able to decompose the problem and by using their abstraction skills, identifying the structure of the program to be written. Pupils will create algorithms and create their working program in Python. Pupils will learn how to test and evaluate their completed program and assess whether their creation worked as it should have.	**Key assessment:** • Programming Project • Personal Learning Checklist **Additional tasks:** • In class exam question practice • Retrieval practice • Homework – this will compliment what they are creating in class and be focused around their project.

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Year 11

Term	Unit of Work	Knowledge and Skills	Assessment
1	Fundamentals of Data Representation Recap – Computer Systems	This term pupils will be exploring how computers store data. They will explore the format it takes in the memory and learn to convert data into binary. This data represents that of images, sound, text and general data and information stored on the computer. The Topics included are: • Number Bases • Converting between number bases • Units of information • Binary arithmetic • Character encoding • Representing images • Representing sound • Data Compression Pupils will also be recapping the following from a year 10 topic: • Hardware and software • Boolean Logic • System architecture • Software classification	**Key assessment:** • 3.4 & 3.3 End of Topic Assessment • Personal Learning Checklist (Online self-assessments) **Additional tasks:** • In class exam question practice • Retrieval practice of past topics • Homework – topic-based worksheets and skills application • Revision
2	Build up to Y11 mock	This term is the pupil's mock exams. Pupils will complete preparation for this in class covering the following topics: • Writing & Interpreting Algorithms practice • Programming recap • Subroutines & Arrays When mocks are complete, time will be spent in class covering areas of he mock that pupils need to improve.	**Key assessment:** • Y11 Mock • Personal Learning Checklist (Online self-assessments) **Additional tasks:** • Revision – the topic will be individually identified by their PLC. • In class exam question practice

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			• Retrieval practice of past topics • Homework – topic-based worksheets and skills application • Session 6
3	Fundamentals of Cyber Security Recap – Fundamentals of computer networks Build up to Yr11 mock Ethical, Legal & Environmental Issues	This term pupils will explore the importance of keeping information, data and programs secure. Pupils will delve into all types of security threats and how to protect your computer system from these threats. Pupils will learn about the types of social engineering, how to recognise them and more importantly how to protect themselves against them. The topics covered are: • Cyber security threats • Penetration testing • Social engineering • Malicious code • Methods to detect and prevent cyber security threats Pupils will also be recapping the following from a year 10 topic: • Types of computer network • Wired/Wireless networks • Network topologies • Network protocol • Network security • Four-layer TCP/IP model Next term is the pupil's mock exams. Pupils will complete preparation for this in class by completing revision and retrieval activities. Most importantly, pupils will be practicing exam techniques and strategies. Pupils will study the ethical, legal and environmental issues caused by our use of technology. Students will explore each topic in turn and be using real world examples to add depth to their learning. The topics covered are: • Cyber security	**Key assessment:** • 3.5 & 3.6 unit assessment • Personal Learning Checklist (Online self-assessments) **Additional tasks:** • Revision – the topic will be individually identified by their PLC. • In class exam question practice • Retrieval practice of past topics • Homework – topic-based worksheets and skills application. Pupils will also be practicing and self-marking exam questions at home, as well as in class.

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		• Mobile technologies • Wireless networking • Cloud storage • Theft of computer code • Issues around copyright of algorithms • Cracking • Hacking • Wearable technologies • Computer based implants	
4	Mock exam Ethical, Legal & Environmental Issues Revision Programme Exam practice lessons	This term students will sit their second mock exam (this is delayed. Awaiting announcement of the date when pupils will return to school). This last term pupils will further study the ethical, legal and environmental issues caused by our use of technology. Students will explore each topic in turn and be using real world examples to add depth to their learning. The topics covered are: • Cyber security • Mobile technologies • Wireless networking • Cloud storage • Theft of computer code • Issues around copyright of algorithms • Cracking • Hacking • Wearable technologies • Computer based implants Revision programme influenced by Y11 Mock results and unit assessments. Pupils will receive one lesson per week focusing on exam questions. This is a teacher led activity where pupils will write answers to previous exam questions and we will mark this	**Key assessment:** • Yr 11 mock • Personal Learning Checklist (Online self-assessments) **Additional tasks:** • Revision – the topic will be individually identified by their PLC. • In class exam question practice • Retrieval practice of past topics • Homework – topic-based worksheets and skills application. Pupils will also be practicing and self-marking exam questions at home, as well as in class.

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		together exploring where marks were and the techniques to be used to gain a higher mark as possible.	
5	Revision Programme Exam preparation	This term sees the real GCSE Computer Science exam. Pupils will focus on revising topics which will be identified individually. In class the full focus will be on pupil's exam technique, strategies and pupil's ability to know what the question is asking. This will enable the students to answer their paper to the best of their ability.	**Key assessment:** • Continual in class exam practicing and marking • Personal Learning Checklist (Online self-assessments) **Additional tasks:** • Revision – the topic will be individually identified by their PLC. • Retrieval practice of past topics • Homework – topic-based worksheets and skills application. Pupils will also be practicing and self-marking exam questions at home, as well as in class.