2022-2023 Key Stage 3 Curriculum Map – COMPUTING

Students in Year 7 and 8 study Computing once a week. In Year 9 students experience the subject via a rotation of 9/10 lessons. We deliver the three distinct strands within computing: **Computer Science, Information Technology and Digital Literacy**. Each component is essential in preparing students to thrive in an increasingly digital world. Students are encouraged to embrace new technology safely both in and out of school.

Year 7 Curriculum Map 2022-23		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Computing	Curriculum Content inc Knowledge, Skills & Cultural Capital	INTRODUCTION Managing Information Students will learn how to logon to a WCA computer using their unique details, and how to access their files and folders in their home area. • Network drives • Files/Folders • File Naming • File Organisation • Strong Passwords 7.1 E-Safety Digital Footprints. Students will learn how to manage their online presence so that it is in line with how they want to be seen in real life and make good choices about the online content they view. • What is a digital footprint? • Positive Online Reputation 7.2 Applications Software (MS PowerPoint) Presenting Information Law & Ethics - Plagiarism	7.3 Computer Systems Students will learn that a computer is an electronic device that accepts data, processes data, generates output, and stores data: INPUT-PROCESS OUTPUT-STORAGE Students will then learn to identify a range of input and output devices. Finally, students will learn about the CPU and its role in processing instructions and data, and how RAM is used to store currently used instructions and data. • I-P-O-S • I/O devices • CPU • RAM	7.4 Algorithms Students will learn what an algorithm is and how they can be used to solve problems. Algorithms can be designed using a flowchart. Students will learn how searching algorithms work. • Algorithms • Flowcharts • Linear Search 7.5 Computational Thinking Students will learn that before computers can solve a problem, the problem and the ways in which it can be resolved must be understood. Decomposition helps by breaking down complex problems into more manageable parts. • What is decomposition? • Why is decomposition important? • Decomposition in practice	7.6a Programming Fundamentals Students will design, develop, test, evaluate a game using the KODU application. Visual-based programming. 7.6b Programming Fundamentals Students will learn some fundamental programming techniques using the Python programming language and the IDLE Integrated Development Environment. Text-based programming. • Variables • I-O Operators • Sequence, Selection, Iteration	7.7 Data Management Students will learn that spreadsheets are used to store information and data. Then they will learn that the spreadsheet can be used to run calculations on the data, make graphs and charts and analyse patterns. • Worksheets • Formulas • Modelling • Charts • Data Collection • Data Analysis	7.8 Data Storage Students will learn how to convert positive denary whole numbers to binary numbers (up to and including 8 bits) and vice versa. Students will then learn how to add two binary integers together (up to and including 8 bits) and explain overflow errors which may occur. • Binary-Denary • Denary-Binary • Binary Addition • Overflow Errors
2 hrs per fortnight	Assessment	Practical software task SMP Using presentation software to inform (Positive Online	Written test Milestone Assessment All topics to date: knowledge and understanding	Practical Programming task SMP Design and write code to solve a problem	Written test Milestone Assessment All topics to date: knowledge and understanding	Practical software task SMP Using a spreadsheet to model data	Written test Milestone Assessment All topics to date: knowledge and understanding

		Reputation)				
	Literacy Links	• Keywords related to each computing topic are introduced on the intentions slide at the beginning of the lesson. • Definitions for the keywords are learnt either via teacher, whole class presentation, or finding the definitions from an online glossary, or answering questions/quizzes that test knowledge. • Students will be expected to use the correct terminology when describing and explaining. • Knowledge Organisers also highlight the keywords and definitions. • Milestone assessments assess the application of the keywords learnt for each topic. • Students are given the opportunity to read out loud during whole class presentations. • Reading around the topic using online resources and carrying out independent research for specific articles using concise keywords.				
	Curriculum Links		Mathematics Solving equations Design Technology Robotics	Design Technology 2D Designing Designing for users needs Chair design	Art Repeating patterns	Mathematics Expressions, functions and formulae Collecting and analysing data – calculating averages from a list, bar charts, pie charts, scatter graphs, and line graphs	Mathematics Place value, powers and exponents
	Outside of the Curriculum	All students have the opportunity to take part in the Safer Internet Week in February. Students are encouraged to take up puzzle solving activities like chess, rubik's cube, including online versions. Students are encouraged to explore programming languages other than Python, and practice them using W3Schools.					
	How can I support my child?	• There are many excellent online resources that our department use to support students' learning in lessons. These resources can also be accessed from home. This website is widely used for many of the topics taught at KS3. https://www.bbc.co.uk/bitesize/subjects/zvc9q6f • The YouTube videos published by code.org are fantastic and are used to support learning for the unit Computer Systems. Google "How computers work code.org" • Students need to revisit keywords learnt in lessons so that they can become more confident in using them when explaining computing concepts. Supporting your child with this can be done by accessing this fantastic online glossary, which we also use in lessons. If you have trouble seeing the page in IE, please try an alternative browser like Chrome. https://www.teach-ict.com/glossary/A.htm • Homework is set once a fortnight on MICROSOFT TEAMS as an Assignment, mainly in the form of a multiple-choice quiz. This tests your child on the key knowledge learnt in recent lessons. Ensure that your child has either the TEAMS app installed on their computing device or they can access TEAMS online via this link https://teams.microsoft.com. Students can also access the TEAMS app via their Microsoft 365 school email account. • Programming is a major element of the Computing curriculum at all key stages. Our students learn the Python programming language. Encourage your child to practice programming. An excellent website is W3Scools, which we use at all key stages. https://www.w3schools.com/python/ • There are many connections with Computing and the concepts and principles learnt in Maths. You could encourage your child to solve the following mathematical/computing puzzles. They will help students understand the topics on Computational Thinking and Data Representation in a fun way. https://www.mathsisfun.com/games/towerofhanoi.html Binary Game v2 - App Lab - Code.org				

Year 8 Curriculum Map 2022-23		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Computing	Curriculum Content inc Knowledge, Skills & Cultural Capital	**REVIEW** Managing Information Students will revisit how to logon to a WCA computer using their unique details, and how to access their files and folders in their home area. • Network drives • Files/Folders • File Naming • File organisation • Strong Passwords **8.1** E-Safety Malware/Preventions. Students will learn how to keep their digital devices safe from different forms of malware. • What is malware? • Virus, Worm, Trojan, Spyware • Anti-virus software **8.2** Applications Software (MS Word) Presenting Information Law & Ethics - Copyright	**8.3** Computer Systems Following on from the Introduction to Computer Systems in Year 7, students will learn how computers work using Circuits and Boolean Logic. Students will then revisit the CPU and learn the stages of the FDE cycle. Finally, students learn how both hardware and software are needed to make a computer work. • AND, OR, NOT simple circuits • Truth tables • FDE cycle • Hardware and Software	**8.4** Algorithms Following on from Algorithms in Year 7, students will revisit what an algorithm is and how they can be used to solve problems. Algorithms can be designed using a pseudocode. Students will learn how the sorting algorithms works. • Algorithms • Pseudocode • Bubble Sort **8.5** Computational Thinking Following on from Computational Thinking in Year 7, students will learn another technique to help solve problems. Abstraction is filtering out the characteristics that we don't need in order to concentrate on those that we do. • What is abstraction? • Why is distraction important? • How to abstract	**8.6** Programming Techniques Following on from Programming Fundamentals in Year 7, students will learn further programming techniques using Python and IDLE. • Procedures and Functions • Syntax and Logic errors • Commenting	**8.7** Data Management Following on from data management of spreadsheets in Year 7, students will learn that databases are involved with everything we do online. From social networking to the BBC website. That they are crucial tools used to store and manipulate large amounts of data in an organised way. • Data Types • Paper vs Digital Databases • Queries • Data Presentation	**8.8** Data Storage Following on from the unit Data Storage (Numbers) in Year 7, students will learn how computers use binary to represent characters, images and sound. • Characters Binary codes and the term 'Character Set' • Images Pixels and colour depth • Sound Analogue vs Digital sounds Sampling
2 hrs per fortnight	Assessment	Practical software task SMP Using tables in MS Word to summarise information (Types of Malware and Prevention)	Written test Milestone Assessment All topics to date: knowledge and understanding	Practical Programming task SMP Design and write code to solve a problem	Written test Milestone Assessment All topics to date: knowledge and understanding	Practical software task SMP Using a database to store and manipulate data	Written test Milestone Assessment All topics to date: knowledge and understanding

Literacy Links	• Keywords related to each computing topic are introduced on the intentions slide at the beginning of the lesson. • Definitions for the keywords are learnt either via teacher, whole class presentation, or finding the definitions from an online glossary, or answering questions/quizzes that test knowledge. • Students will be expected to use the correct terminology when describing and explaining. • Knowledge Organisers also highlight the keywords and definitions. • Milestone assessments assess the application of the keywords learnt for each topic. • Students are given the opportunity to read out loud during whole class presentations. • Reading around the topic using online resources and carrying out independent research for specific articles using concise keywords.	

Curriculum Links		Science Electricity, currents and circuits	Mathematics Solving word problems, turning English into algebra		Mathematics Collecting and analysing data	Science Sound waves, amplitude, frequency, analogue signals

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Year 9 Curriculum Map 2022-23		Lesson 1	Lessons 2-5	Lessons 6-8	Lesson 9
Computing	Curriculum Content inc Knowledge, Skills & Cultural Capital	*Review Computational Thinking, Algorithms and Programming* Students will learn what we mean by Computer Science. They will be introduced to the content that will be taught in GCSE Computer Science, and they will revisit Computational Thinking from Year 7 and 8. • What is Computer Science? • GCSE Computer Science • Skills required in CS • Careers/Applications in CS • Computational Thinking Examples of jobs that use computer science and computational thinking. Computer systems in the home.	9.1 Games Design and Programming Design and create a simple 2D Treasure Hunt game Students will learn how to design a 2D game that meets user requirements. They will learn to use advanced programming techniques to develop the game. • Advanced Programming Techniques – Arrays • Python Programming Language • User Requirements Experience of coding in a text-based programming language using an IDE installed on the network. How to access an online editor.	*Review Computer Systems* 9.2 Robotics (CS & DT) Students will learn to define a robot, and to identify what robots are used for. They will understand why robots are used instead of humans. Mini-robots will then be programmed to carry our specific tasks. Application of robotics in the real world.	Assessment & Feedback (9.1, 9.2)
9 hrs per rotation	Assessment	Written assessment: What is computer science and computational thinking?	Written assessment: SMP Decomposition and game requirements Assess final program using success criteria	Independent Practical Task: Final lesson (8), to assess skills learnt.	Written assessment: Milestone Assessment Knowledge, skills and understanding covered in rotation Exam style questions
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	Curriculum Links		Design Technology 2D Designing Designing for users needs Chair design	Mathematics Solving word problems, turning English into algebra Polygons and drawing shapes	
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- The YouTube videos published by code.org are fantastic and are used to support learning for the unit Computer Systems.
  Google "How computers work code.org"
- Students need to revisit keywords learnt in lessons so that they can become more confident in using them when explaining computing concepts. Supporting your child with this can be done by accessing this fantastic online glossary, which we also use in lessons. If you have trouble seeing the page in IE, please try an alternative browser like Chrome.
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