

# Curriculum Overview

Computing/2020-2021

St Michael's  
Catholic High School



*"Bringing Christ to all and all to Christ"*

**CURRICULUM INTENT:**

The Computing & IT Department wants to inspire the next generation of computer scientists, whilst at the same time equipping all students with the digital literacy skills to enable them to make appropriate choices when they are using computer equipment and interacting with the wider world. E-safety is therefore a theme which is visited every year. We aim to provide a broad, balanced and enjoyable computing education for all of our students. Some of the content students will cover includes the fundamentals of computer equipment (hardware and software), algorithmic thinking, creating computer programs using visual and text-based programs, as well as data handling techniques.

## COMPUTING

COMPUTING								
	AUTUMN TERM		SPRING TERM		SUMMER TERM			
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2		
<b>Year 7</b>	<b>Year 7 Knowledge:</b> What will students know?	Students will know how to access their own user area on the school network, as well as how to access subject areas on the RMShared area. Students will know how to log on, change passwords, and save work to their user area. They will know how to use Gmail email and access material on Google classroom. Students will know the definition of 'fake news' and the criteria that can be used to tell if information is accurate, reliable and trustworthy.	Students will know that all online activity leaves a digital footprint. Students will know the risks of online activity and learn how they can stay safe. Students will know how to be responsible digital citizens. To know that their current actions might have an impact on their future selves.	Students will know what algorithms are, how they can be written and how can be used in computing	Students will know more about the units of measurements used in computing, e.g. bit, nibble, bytes, Kilobyte. Students will know the difference between binary (base 2) and denary (base 10)	Students will know what makes an effective game for one and two players	Students will know that the rate of change in technology is fast-paced. They will research new developments (future technology) and share these ideas with classmates	<b>Year 7</b>
<b>Year 7</b>	<b>Year 7 Skills:</b> What skills will students have developed?	How to change their password How to send/receive and delete emails How to access Google classroom from inside and outside school, and how to upload work	To think before sharing and or posting To be able to judge the possible impact of their online activity on others	Students will be able to write and draw simple algorithms and use SNAP BYOB software to create programs to draw shapes (automatically)	Students will be able to list units of measurements in order Students will be able to convert binary to denary and denary to binary	Students will further develop algorithms to plan and create a challenging one- or two-player game using Kodu Gamelab software	Students will be able to work in groups and share workload They will be able to present future technology ideas using reliable sources of information	<b>Year 7</b>
<b>Year 8</b>	<b>Year 8 Knowledge:</b> What will students know?	Students will investigate 'How Computers Work', looking at the hardware and software that comprise computers.	Students will revisit the etiquette of social networking	Students will know that webpages are coded using HTML and CSS	Students will know that webpages are coded using HTML and CSS	Students will further develop algorithmic thinking by revisiting SNAP BYOB where they will program code to encrypt and decrypt text based on user inputs	Students will learn how to use spreadsheets effectively for storing, manipulating and presenting data	<b>Year 8</b>
<b>Year 8</b>	<b>Year 8 Skills:</b> What skills will students have developed?	Students will be able to identify common hardware components and uses of common software	Students will be able to recognise cyber-bullying and what to do about it	Students will be able to adapt and write HTML code to create webpages of their own	Students will be able to adapt and write HTML code to create webpages of their own	Problem solving skills Students will use the concept of the Caesar cipher to write their code	Students will be able to format data in a worksheet, use formulae and create charts/graphs	<b>Year 8</b>
<b>Year 9</b>	<b>Year 9 Knowledge:</b> What will students know?	Students will know that databases can also be used for data handling	Students will learn about different types of computer networks and viruses. Students will know the difference between LANs and WANs. Students will know how computer viruses can be spread	Students will know what sexting is and why it is a high-risk activity for young people Students will know who to talk to if they are worried about it	Students will develop text-based coding skills by using 'Python' to program solutions to challenges	Students will use 'App Inventor' software to create their own app	Students will register or the 'Duke of York Digital Award' which allows them to choose the IT-or Computing or Enterprise related topics linked to their GCSE options	<b>Year 9</b>

<b>Year 9 Skills:</b> What skills will students have developed?	Students will be able to add, edit and delete data in a database, as well as run queries and create database reports	Students will be able to draw and identify star, ring and bus networks as well as identify different types of viruses and how they can protect themselves from viruses	Students will be able to judge whether their actions are sexting or not	Students will learn about the techniques of sequence, selection and iteration	Students will learn problem solving skills and work with others to create their own app	Students will be responsible for choosing their own 'badges' to complete and managing their own time	Year 9
<b>Key Stage 4 GCSE Examination Board: OCR</b>							
<b>Year 10 Knowledge:</b> What will students know?	Data representation: storage units, binary numbers, binary addition, hexadecimals, character sets, sound and images, data compression methods	Systems architecture, memory and storage: the CPU (functions and characteristics), memory and storage	Networks (wired and wireless): the internet, WANs, LANs, wireless networking, client-server and peer-to-peer networks, protocols and layers	Systems software and security: Network threats, identifying and preventing vulnerabilities, operating systems (OS), utility software	Ethical, legal, cultural and environmental concerns: computer systems in the modern world, ethical, cultural and environmental issues, legislation and privacy	Algorithms: computational thinking, searching and sorting algorithms, flow diagrams, pseudocode, interpreting, correcting and completing algorithms	Year 10
<b>Year 10 Skills:</b> What skills will students have developed?	Converting units of measurements (e.g. KB to GB) Converting binary to denary (and visa versa) Binary addition Binary shifts Converting to/from hexadecimal Calculating colour depth/image file size Calculating sound sample rates	Understanding Von Neumann architecture Identifying components of a CPU Explain the fetch-decode-execute cycle Differentiate primary and secondary memory with examples	Explain link IP addresses and domain names Explain packet switching Draw and give +/- of star and mesh topologies Explain encryption Identify network protocols	Understand forms of attack and threats Identify and explain way to prevent vulnerabilities Describe purpose and function of an OS Describe purpose and function of common utility programs Describe methods of backup	Explain how different stakeholders are impacted by technology Compare open source and proprietary software Understand e-waste Understand laws and legal issues	Explain abstraction, decomposition and algorithmic thinking Use trace tables Carry out binary and linear searches Carry out bubble, insertion and merge sorts Create and complete algorithms using flow charts and pseudocode	Year 10
<b>Year 11 Knowledge:</b> What will students know?	Programming: programming concepts, sequence, selection, iteration, arrays, procedures and functions, records and files	Logic and languages: logic diagrams and truth tables, defensive design, errors and testing, facilities of an IDE	NEA: 20 hour programming project	NEA: 20 hour programming project	Exam preparation	n/a	Year 11
<b>Year 11 Skills:</b> What skills will students have developed?	Use correct datatypes Use casting to change variable types Use constants and variables Use common arithmetic and Boolean operators Use sequence, selection and iteration Use one- and two-dimensional arrays Use basic file-handling operations (e.g. read, write) Use SQL to search for data Use sub-programs	Draw and complete simple logic diagrams Draw and complete truth tables Describe defensive design considerations Use comments and indentation to assist maintainability Understand purpose of and be able to test code Identify syntax and logic errors	Use flow charts and/or pseudo code Use casting to change variable types Use constants and variables Use common arithmetic and Boolean operators Use sequence, selection and iteration Use one- and two-dimensional arrays Use basic file-handling operations (e.g. read, write) Use sub-programs Test code and use comments	Use flow charts and/or pseudo code Use casting to change variable types Use constants and variables Use common arithmetic and Boolean operators Use sequence, selection and iteration Use one- and two-dimensional arrays Use basic file-handling operations (e.g. read, write) Use sub-programs Test code and use comments			Year 11
<p><b>IMPACT:</b> DEPARTMENT INSERT SUMMARY OF IMPACT OF CURRICULUM includes assessment information, feedback information, how students learn, impact of the curriculum</p> <p>In KS3 students will be assessed roughly once a half-term, which normally coincides with the end of a topic. Assessment may take the form of a paper-based test, an online test or the completion of a series of tasks that show the practical skills a student has developed. Students are encouraged to share ideas and test each other's programs/solutions e.g. creating a game.</p> <p>All topics covered in KS3 are designed to prepare students for either GCSE Computer Science or the L1/2 OCR National in Information Technologies. The GCSE is assessed through two exams at the end of Year 11, whilst the L1/2 course is assessed through an external examination at the end of Year 10 and an NEA course work unit completed under controlled conditions in Year 11 (both elements are worth 50% each).</p> <p>In KS4 students have formal end of unit assessments, with developmental quizzes and tests part way through the topics to facilitate formative feedback. All assessments aim to prepare students for their final external examinations and will get progressively more challenging throughout the key stage.</p> <p>Both KS4 courses allow for progression onto the L3 Cambridge Technicals in IT course in the Sixth Form. This is equivalent to one A Level. The course has aspects of computer systems, product design, project life cycle and data handling, and is assessed via both external examinations and internal course work assessments. There are three external (mandatory examinations) and the two internal assessments are chosen from a list of four optional units.</p>							