

COMPUTING

YEAR 7

	Topic	Knowledge What will students know by the end of this unit?	Skills What skills will students have developed by the end of this unit?	Big Idea What are the essential ideas which students could not leave school without?	Cross Curricular What links to other subjects / enrichment might be made?
Half Term 1 & 2	Animal Shelter ICT Topic	Students will be able to effectively search and select relevant information to inform decisions in their project. Students will go onto develop their understanding of corporate identity through branding ie. Creating a logo which will inform their house style guide. Students will know how to manage a budget for this project and different ways to engage with an audience.	Students will acquire the skills to be able to perform boolean searches within search engines, as well as using a range of sources which will help to validate their decisions. Time management will be a skill which the students will develop in order to complete their project. Software skills will include using vector graphic design, modelling with excel, advanced word processing and presentation skills. Students will be evaluating throughout via formative 'buddy feedback' and a summative evaluation.	Essential ideas will be the overall project management skills to run a successful project and transferable IT skills which will be invaluable within any future career.	This topic will be cross curricular with <b>business</b> (marketing and organisation structures), <b>Maths</b> (advanced excel formula), <b>English</b> (choice of wording and copy writing), <b>art &amp; DT</b> (designing and creating vectors)
Half Term 3	E-safety	Students will gain knowledge of how to prevent and act upon causes of concern when online. They will be able identify scenarios where they could be at risk and raise awareness of such scenarios	Students will be able to determine how to stay safe when online. Students will communicate their knowledge through the form of an animation. Developing skills in aiming information at a specific audience and purpose.	An online presence is every growing and constantly changing. It can have life changing impacts if used incorrectly. This has to be thought about and revised on an ongoing basis if we truly want to stay safe in an online world.	This topic will have cross curricular links with <b>citizenship</b> (taking a look at the technical side of e-safety)
Half Term 4	How a computer works	Students will be able to understand the fundamental working of a computer and the hardware which is used to create a computer. They will understand an abstracted model of how the CPU works alongside RAM, storage and I/O. Students will also understand why binary is used in computer systems.	Skills students will acquire is how to count using the base 2 numerical system binary and how to do basic binary addition. They will be able to identify and explain the key components of a computer. Begin to develop answering exam style questions.	Computers are used every day in society so it is important for students, to have an understanding of how the devices they use work and how they can be developed.	This topic will have cross curricular links with <b>Maths</b> (binary) and <b>physics</b> (how a computer is operated through electricity)
Half Term 5 & 6	Programming with Scratch	Students will develop and understand how to think both logically and computationally. Students will be able to decompose and abstract problems to create programmed solutions using sequence, selection and iteration. Problem solving is the main area of knowledge throughout this topic.	Students will demonstrate this knowledge through the programming language of scratch. Skills will include implementing sequence, selection and iteration to this programming language, a vital skill which is used throughout computer science. They will use their knowledge of audience and design from previous topics to design a game fit for the intended purpose and client.	Programming teaches Students how to think logically. This skill is transferable to most careers and also to day to day living. Students will begin to know how to program which is currently a gap in the workforce across the world.	This topic will have cross curricular links with <b>Maths</b> (sequence, iteration, problem solving, working with numbers), <b>art</b> (design of scratch game), <b>junior science</b> (understanding of testing and control)

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**YEAR 8**

	Topic	Knowledge What will students know by the end of this unit?	Skills What skills will students have developed by the end of this unit?	Big Idea What are the essential ideas which students could not leave school without?	Cross Curricular What links to other subjects / enrichment might be made?
Half Term 1	My Digital World How the internet works and computer scientist project	<p>Students will gain knowledge of how computers work outside of the realms of a standalone computer. They will learn how they connect to other devices and how information is shared across different platforms. They will also understand how web content is created and what to look out for with legitimate websites.</p> <p>Staying safe online with looking at cyber abuse</p> <p>Students will then complete a project based on a computer scientist of their choice and research about their life and their impact on computer science and the wider world.</p>	<p>Students will acquire the skills to analyse a website in order to keep them safe when online. They will also have the skills to discuss how a basic network works and how data and information is shared across the world.</p> <p>Students will use mixed media to link digital to physical mediums as they create their physical fact file projects.</p>	<p>People use the internet every day for a variety of measures. It is important that students have a basic understanding of how this technology works, just as it is important that they know how the human body works.</p> <p>There are some big names in computer science, but also some names which students have never heard of, of who's technological developments are used every day. It is important that these people are recognised.</p>	<p>History - links to research of famous computer science figures.</p>
Half Term 2	My Digital World Website design	<p>Students will gain a greater insight of how websites are created and how they are accessed on a computer. They will understand what makes a good website and be able to apply this to their own. There will be a careers section within this topic where students look at different careers within computer science. This is where the topic of their website will come from.</p>	<p>Students will gain the skills to be able to code a basic website using HTML. They will then transfer their knowledge of what makes a good website to design a website using Photoshop and Marvel App to create a demonstration of a website based on a career within computer science.</p>	<p>Students use websites every day, so it is important that students know how these are made and what makes a good website.</p> <p>It is also very important that students know about the different career paths within computer science. This is an industry where there is a massive shortage of female workers.</p>	<p>Art - designing of a website</p> <p>Careers - linking to Gatsby benchmarks.</p>
Half Term 3 & 4	Programming with Python	<p>Students will know the importance of programming in the workplace in modern day life. They will also know how to break down a problem to create a solution.</p> <p>Students will know how to create simple programs using the three basic programming constructs.</p> <p>Our aim is not to 'teach Python', it is to teach students how to program with the use of Python to apply this knowledge.</p>	<p>Students will be confident at programming, using sequence and iteration. Their skills will be shown by using Python to create simple programs to solve problems.</p> <p>They will be able to think logically and use this skill to help them decompose a problem in order to create the solution.</p> <p>Maths will be required as a skill in order to make shapes within Turtle.</p>	<p>Programming is a skill which is needed for a lot of jobs in the modern world. Not only this, the skills to think logically can be applied to a lot of careers and also life skills.</p>	<p>Maths - calculations and angles when using turtle</p> <p>Careers - the career prospects open to students through having the skill of programming</p>
Half Term 5 & 6	Media	<p>Students will have an understanding, of how the media works and how it affects the mass population. They will understand how we can be influenced by the media, including body image.</p> <p>Students will understand what makes an effective video and image and how they can be used to evoke certain emotions.</p>	<p>Students will have the skills to analyse images and apply their knowledge of this to decide if a piece of media is true or not. They will also learn some basic photoshop skills to restore some old film images.</p> <p>The Students will also acquire the skills to plan a professional looking film trailer and use key camera and editing techniques to recreate a certain emotion to fit in with the genre of a chosen book.</p>	<p>Students need to have the knowledge of how the media can affect our judgement and from this decide if a piece of media is trustworthy. This is important in a society where multiple types of media are constantly pushed onto the devices, we use every day.</p>	<p>Citizenship - fake news, body image</p> <p>Art - designing storyboards</p> <p>Drama - acting within the film trailers</p>

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**YEAR 9**

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Half Term 1	Cybersecurity	Students will have an understanding about how cyber security is an ever growing field within computer science and why it is important that our data is kept secure.	Students will gain skills to think logically by breaking cyphers using a variety of techniques. Students will also recap binary from Y7 and develop this to understand how hexadecimal can represent numbers and characters. Students will be able to indicate potential security vulnerabilities in computer systems and have the knowledge of how to prevent or recover from a cyber-attack.	As much as it is important that students are taught how to be safe when out in the physical world, now the digital world is becoming ever more prominent it is important that students know how to keep their data safe and secure. There is also a huge job shortage of jobs within the cyber security field.	Maths - strong links with cyphers and code breaking History - reference to WWII and Alan Turing
Half Term 2	Artificial Intelligence	Students will have an understanding, of how AI is becoming part of society in modern day; ethics around self-driving cars for instance. They will understand the basics of AND, OR and NOT gates and how they work within a computer system. They will also apply this knowledge to physical programming with the use of Micro: Bits and robots.	Students will practise their discussion skills when looking at the ethics of AI in society. Using logic gates and being able to draw truth tables. They will be able to link to how this is important within computer science. Students will acquire the skills to program for a physical output of a robot. They will use their knowledge of how simple self-driving cars work and apply this to their own working version.	Ethics of AI and the way in which data is shared is something that is going to become a more normal part of everyday life as the years pass. Drawing on logical thinking skills again from the programming section of the topic.	Psychology and RS - ethics of AI Maths - logic gates
Half Term 3 & 4	Python v2	There will be a recap of knowledge from Y8 and a slight overlap of teaching previous techniques to ensure their knowledge is at a standard to which every student can progress this topic. Students will gain greater knowledge about programming, looking more in-depth at iteration and lists. The end of the unit will involve physical programming with Micro: Bits	Students will acquire the skills to think logically and apply this logic to create a computational solution using programming techniques used in lessons.	Programming is a skill which is needed for a lot of jobs in the modern world. Not only this, the skills to think logically can be applied to a lot of careers and also life skills. This is a continuation of what students study in Y8. As programming is a functional skill, it is important that it is revisited before GCSE studies.	Maths - use of operators and logic Science - electronics and simulations discussed and used
Half term 5 & 6	Stop Motion	Students will gain knowledge of how to express their ideas in the form of digital content. They will learn about how films are made with frames and how to best plan and compose a stop motion video. They will gain knowledge on the theory of editing stop motion video and look into how professional films are created in industry.	Students will be able to plan using story boards to translate their ideas to an industry standard plan. Students will acquire the skills to compose and take photographs in order to create a stop motion video. Students will practise their video editing skills with the photographs they have taken, balancing their knowledge of video and sound.	Digital content is a massive part of society now. With films, YouTube, Instagram etc being massive social platforms for businesses and enterprises, it is important for them to be able to connect with the content they are exposed to.	Art - planning the stop motion and using creative ideas.