

## Year 8 Computer Science – Outline Programme of Study

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Big Ideas/ topics	E-Safety: Digital Footprint	Computing Systems	Data Representation	Problem Solving	Coding - Micro:Bits Block Programming	Coding - Micro:Bits MicroPython
Key Knowledge	<ul style="list-style-type: none"> <li>- Understand what makes up a digital footprint.</li> <li>- Understand the impact a digital footprint can have.</li> <li>- Research and become aware of their own Digital Footprint.</li> <li>- Able to explain what should be done if cyber bullying is occurring.</li> <li>- Develop a script about the dangers of Digital footprints.</li> <li>- Develop a script about the dangers of Digital footprints.</li> </ul>	<ul style="list-style-type: none"> <li>- Explain the difference between a general-purpose computing system and a purpose-built device.</li> <li>- Describe how the hardware components used in computing systems work together.</li> <li>- Define what an operating system is.</li> <li>- Use logic gates to construct logic circuits (AND, NOT, OR)</li> <li>- Describe how hardware is built out of increasingly complex logic circuits.</li> <li>- Describe how machine learning differs from traditional programming.</li> </ul>	<ul style="list-style-type: none"> <li>- Use different coding schemes to send and receive messages.</li> <li>- Able to explain what a binary digit is.</li> <li>- Able to explain the difference between the number systems binary and decimal.</li> <li>- Explore how a sequence of binary digits can represent numbers.</li> <li>- Convert between decimal and binary numbers.</li> <li>- Explore what bytes are, and what the prefixes kilo-, mega-, giga- and tera-mean.</li> </ul>	<ul style="list-style-type: none"> <li>- Learn about Computational thinking and use it to solve problems.</li> <li>- Define real world problems.</li> <li>- Brainstorm ways an app could be used to help solve that problem.</li> <li>- Identify the inputs / outputs / storage / processing used by your app.</li> <li>- Share your ideas with another group for peer feedback.</li> <li>- Incorporate feedback to create a final version of the app.</li> </ul>	<ul style="list-style-type: none"> <li>- Able to create a block program that has text, pictures and animations appear on the L.E.D. display.</li> <li>- Use 'input' blocks so your program can use the buttons and gestures.</li> <li>- Able to explain and use a function.</li> <li>- Use functions to improve a program.</li> </ul>	<ul style="list-style-type: none"> <li>- Output text and images using the text-based programming language MicroPython.</li> <li>- Create and output an animation using MicroPython.</li> <li>- Able to personalise programs to respond to user input.</li> <li>- Use Random module to create programs that respond randomly.</li> <li>- Use the built in sensor within the Micro:Bit to sense magnetic fields.</li> <li>- Explore the use of Pins on the Micro:Bit as an input.</li> </ul>

### Further information and reading list

- Our Key Stage 3 prepares students for Computer Science (AQA 8525) and Creative Media (OCR J834) at GCSE.
- Book: KS3 Computing Complete Revision & Practice (CGP) <https://www.cgpbooks.co.uk/secondary-books/ks3/computing/cos31-ks3-computing-complete-revision>
- Useful websites:
- Oak Academy: <https://classroom.thenational.academy/subjects-by-key-stage/key-stage-3/subjects/computing>
- BBC Bitesize: <https://www.bbc.co.uk/bitesize/subjects/zvc9q6f>
- Code Club: <https://projects.raspberrypi.org/en/codeclub>
- GCF Global: <https://edu.gcfglobal.org/en/topics/googleapps/>

### Ways to support and extend student learning in this subject

#### Support guidance:

- Students need to be secure in their understanding and use of the Google applications. They should be able to access resources, work collaboratively online and submit a range of assignments through the Google Classroom portal. For additional support please use GCF Global and the YouTube tutorials: <https://edu.gcfglobal.org/en/topics/googleapps/>
- If you wish to revise or revisit a topic, then you can use Oak Academy with its online tutorials: <https://classroom.thenational.academy/subjects-by-key-stage/key-stage-3/subjects/computing>
- High-achieving guidance:
- Students can access online resources to extend their knowledge e.g., Complete online tutorials within Scratch: <https://scratch.mit.edu/projects/editor/?tutorial=getStarted>, explore the classroom topics further via the BBC Bitesize website: <https://www.bbc.co.uk/bitesize/subjects/zvc9q6f> or continue independently learning programming skills with Code Club: <https://projects.raspberrypi.org/en/codeclub>