# Curriculum Map

## Subject: Computer Science

The study of Computer Science at Avanti Grange empowers students to thrive in an increasingly digital and interconnected world. Pupils will gain a robust understanding of computational principles, programming languages, and technological applications, while critically engaging with the ethical implications of technology. They will explore foundational concepts in computer science, fostering creativity and problem-solving skills, and will be encouraged to develop their own perspectives on the role of technology in society. Through collaborative projects and innovative thinking, students will become adept at navigating challenges and making informed decisions as responsible digital citizens.

| Year Group | Autumn Half Term 1 | Autumn Half Term 2 | Spring Half Term 1 | Spring Half Term 2 | Summer Half Term 1 | Summer Half Term 2 |
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| **Key Stage 3** | | | | | | |
| 7 | Topic 7.1: **Using Computers Safely, Effectively and Respectfully** Learning to use computers safely, effectively and respectfully including getting started at Avanti Grange, sending email, file management and e-safety.  Bebras Practice | In early November all students will participate in the UK **Bebras Computational Thinking Challenge** NC 3.2 Algorithms, NC 3.3 Programming, NC 3.4 Logic,   Topic 7.2: **Programming in Scratch** Developing an understanding of the core programming constructs: sequence, selection, and iteration. | Topic 7.3: **Understanding Computers** Discover how computers work: The basic principles of computer architecture and the use of binary. | Topic 7.4: **Modelling data – Spreadsheets** Developing a model: The storage, organisation and analysis of data including sorting and filtering data and using formulas and functions. | Topic 7.5: **Networks** How data travels the world: the basic principles and architecture of local and wide area networks. | Topic 7.6: **Game Programming in Scratch** Development of a live web game including collision detection, platforms, lives, objects and projectiles |

| 8 | Topic 8.1:<br>**Using Media**<br>Using Digital Literacy skills to create a Blog Post including software formatting, the reliability of sources, plagiarism, licensing and legal issues<br><br>Bebras Practice | In early November all students will participate in the UK **Bebras Computational Thinking Challenge** NC 3.2 Algorithms, NC 3.3 Programming, NC 3.4 Logic,<br><br>Topic 8.2:<br>**AI and Machine Learning**<br>Exploring automated vehicles, image recognition, sentiment analysis and deep learning alongside the ethical implications of AI | Topic 8.3:<br>**Developing for the web**<br>Using HTML and CSS to create responsive, hyperlinked websites. | Topic 8.4:<br>**Computational Thinking and Logic**<br>An introduction to logic, including logic gates and truth tables, problem solving, decomposition and abstraction. | Topic 8.5:<br>**Introduction to Python programming**<br>Applying the programming constructs of sequence, selection, and iteration in Python. | Topic 8.6:<br>**Cybersecurity**<br>Identifying how individuals and organisations can protect themselves from cyberattacks. |
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| 9 | Topic 9.1:<br>**Graphics**<br>Creating and understanding vector and bitmap graphics including scaling, resolution and file size<br><br>Bebras Practice | In early November all students will participate in the UK **Bebras Computational Thinking Challenge** NC 3.2 Algorithms, NC 3.3 Programming, NC 3.4 Logic,<br><br>Topic:<br>**9.2 Physical computing**<br>Using Python to implement sensing and control with the micro:bit | Topic:<br>**9.3 Python Next Steps**<br>String manipulation, count controlled loops, arrays and the use of procedures and functions in preparation for GCSE Computer Science | Topic:<br>**9.4 Animation in Blender**<br>Creating 3D objects and animations including consideration of lighting and camera angles. | Topic:<br>**9.5.1 Digital Representations:**<br>Representing images and sound using binary digits. Conversion from analog to digital.<br><br>Topic 9.5.2:<br>**Online Safety**<br>including big data, online reputation, social media bubbles, fake news, GDPR and illegal content | Topic:<br>**9.6Mobile App Development**<br>Exploring design techniques, understanding how to improve user experience and safety, developing a working mobile app using AppShed |