



Our Curriculum Aims:

- To instil a love of learning for computing and give pupils reasons to continue to explore it.
- To encourage pupils to be good digital citizens and, respectful and responsible users of IT.
- To provide a skill base for digital work for all subject areas at the school.
- To encourage enterprising pupils who are resilient and independent in thought, action and learning.
- To allow pupils to appreciate the social, ethical, legal and environmental aspects surrounding computing.
- To encourage pupils to consider the global impact of Computer Science.
- To provide an understanding of the principle of computational thinking and its place in computing and, indeed, in everyday life.
- To provide pupils with the tools to effectively employ computing, through computational thinking and algorithms.
- To provide a solid knowledge of programming and appropriate programming techniques.
- To provide a platform for GCSE, A level and beyond.

*The Department **Subject Achievement Map** identifies the skills and knowledge acquisition needed to progress in the subject from year 7-11.*

*For each topic studied in Years 7 and 8, **Topic Descriptor Sheets** detail the knowledge and skills needed to progress in that topic. Topic Descriptors are shared with students at the start of every topic.*

Year 7

AIM - Becoming digitally literate and understand the fundamentals of Computer Science basics

	Name of topic	Key Content of the Topic	Assessment points
HT 1	Unit 1 – AGSB Network	Computer Safety. Network access. Use of Office 365 tools (SharePoint and TEAMS) Use of Satchel One / SMHW	In lesson assessment of using tools
	Unit 2 – Office OneNote, Word & PowerPoint	Basic tools in OneNote, Word and PowerPoint. How to present	2 Word tasks assessed Peer assessed Presentation In class Quizzes
HT 2	Unit 2 – Office Excel	The use of Excel to create a model. Functions and formatting used.	Excel modelling assessed task In class Quizzes
	Unit 3 – Safety & E Safety	How to stay safe when using a computer at school and at home. Health conditions related to using the computer. E safety and social media use.	Workspace at home assessment In class Quizzes
HT 3	Unit 4 – Computer Hardware	Identify the different components inside and outside a computer. Understand the purpose of these devices	In class Quizzes
	Unit 5 -Binary	To understand that computer use binary to communicate.	Calculation Assessment In class Quizzes
	Unit 6 – Fetch Decode Execute Cycle	See how information is stored on a computer and how a processor performs calculations on binary.	FDE Cycle Assignment In class Quizzes
	Unit 7 – Computational Thinking	Understand that computer is used to solve problems in a systematic way. Knowing how to solve logic puzzles is useful in Computer Science	In class Quizzes
HT 4	Unit 8 - Algorithms	To follow steps in an order and to see how we can write programs clearly using Flowcharts. Understand the basic building blocks in Computer Science of sequence, selection and iteration	OneNote workbook.
	Unit 9 – MicroBit programming	Programming physical devices and investigate a range of inputs and output on the device. Sequence, selection and iteration in action.	Numerus small MicroBit challenges assessed
HT 5	Unit 10 – Game Design	Consider the main elements to program within a computer game. How will they be programmed?	Peer Assessment of Game Model
	Unit 11 – Python Programming	Move from a block editor to text editor using Python.	Numerus small Python challenges assessed
HT 6	Unit 11 – Python Programming	Continue to look at the basic building blocks, sequence, selection and iteration is used in Python	Numerus small Python challenges assessed
	Unit 12 – Computer History	Understand how computer science started and how it has developed in recent years.	In class Quizzes

Year 8

AIM – Deepen knowledge of Computer Science in real world examples using programming

	Name of topic	Key Content of the Topic	Assessment points
HT 1	1 Control systems	Programming using Flowcharts and Pseudocode – real life modelling of programming tasks using Flowol	1 task on understanding of flowchart 1 task on understanding of the Flowol Program 3 tasks on individual designed tasks based on Flowol
HT 2	1 Control systems Continued 2 Computer hardware	2 weeks of Control systems to finish the topic Understanding the internal working and purpose of the hardware to build on the basics taught in year 7. This takes the boys up to a GCSE level of understanding	See above for Control systems Hardware is a sequence of 8 individual tasks to check the understanding of the topics covered
HT 3	3Computer Modelling	Using Excel to model an event, allowing students to individually plan and cost an event, resulting in a model similar to that of a real-life situation. Makes use of statistics, probability and the advanced analytics functions of Excel	4 assessment points: 1 Planning and presentation 2 Layout 3 Working model 4 Understanding and implementation of variables
HT 4	3Computer Modelling		
HT 5	4 Python programming	The python challenges are a series on python programs designed to get progressively harder. They start off building the understanding learned in year 7 and the hardest challenge is of A level standard. The aim is to learn and research how to complete as many challenges within the time allocated independently. The impact of Computing and ICT tasks involve the moral and ethical use of ID tags for students in a school environment and the use of digital loyalty cards to track customers details	There are several key grade points through the challenges which are required steps to get their relevant FEDS score. Foundation level is based upon programming skills learned in year 7 leading to Secure which shows sufficient understanding to progress in year 9. There are 2 assessments for the Impacts on Computing
HT 6	4 Python programming Continued 5 Impacts of Computing and ICT		

Year 9

AIM – To prepare for working life with Computers and for GCSE

	Name of topic	Key Content of the Topic	Assessment points
HT 1	Digital Organisation	Lessons cover the ability to organise themselves in a digital world. Use of Email, calendars and tools for organisation all used.	In Class Quizzes
	Bring your own device	Considering the rules and possible problems with students bring in their own devices within school. Gives the students understand that its not just a case of just allowing devices in schools.	A Marked report detailing the use of devices within school.
	Binary and Hex	Understanding the fundamentals of how a computer uses and stores, numbers, letters, and images. Covers, Denary to Binary, Binary to Denary, Denary to Hexadecimal, Hexadecimal to Binary, Binary to Hexadecimal, Hexadecimal to Denary, Binary Addition, Characters to Binary, Images to Binary.	In Class Quizzes
HT 2	Binary and Hex continued		In Class Quizzes
	Digital Citizenship	A topic to look at their future use of Computers covering topics What is a Good Citizen? How does your digital self-differ from your physical self? How do you treat Yourself, Other and Information online? Valuable Data & Password Management. Fraud & Fake news. Protecting Devices. Social Media	A digital leaflet that is peer assessed for clarity of material.
	Cryptography	Looking at Why is cryptography & encryption is a crucial part of the modern world. Several cryptography puzzles.	In class puzzles.
HT 3	Social aspects of Computer Science and ICT	Looking at the effect of the use of computers within society. Main themes of the use of video content and how this can be used inappropriately. Focuses upon E Safety.	In Class Quizzes In class discussion participation.
	Python Programming Fundamentals	Recapping the fundamentals of Python programming of sequence, selection and iteration.	In Class Quizzes Small python challenges handed in.
HT 4	Advanced Python Techniques	Using Python to program techniques such as Lists, Sub programs and File handling.	In Class Quizzes Small python challenges handed in.
HT 5	Python Game Design	The advanced Python Techniques are then implemented within a Role-Playing game. Students given the basic program which they must develop.	RPG Report
HT 6	Computer Legislation	Covering the areas of GDPR, Computer Misuse Act and Freedom of information act.	In Class Quizzes Written responses and in class discussion participation.
	Cryptocurrencies	The use of money across the world is considered with the questions raised “Do we really need physical money?” “Should there be 1 currency across the world”	Written responses and in class discussion participation.
	Searching & Sorting Algorithms	2 Common algorithms considered, Searching and Sorting. Different types of each algorithms discussed and performed on given data.	OneNote and In Class Quizzes

What can parents do to support their sons?

Check Satchel One to ensure students are completing work that has been set. Work is normally handed in through Microsoft 365 Teams or through their Class Notebook (One Note).

GCSE Course Followed: Computer Science

Specification:

Yr10 (2020 onwards) [OCR \(Syllabus code J267\)](#)

Why Choose GCSE Computer Science

This is a course that has real relevance in our modern world. While you will no doubt already have some knowledge of computers and related areas, the course will give you an in-depth understanding of how computer technology works and a look at what goes on "behind the scenes".

With the increasing popularity of small portable computers, such as smart phones, tablets and the Internet of Things, the ability to program is a skill which is increasingly in demand. A recent study highlighted the **lack of British programming talent**, and the App (short for application, or program) industry is clamouring for young, exciting programmers (developers). This course enables you to learn to program and appreciate more about how hardware works. Through this you will develop critical thinking, analysis and problem-solving skills. The course is designed to be a fun and interesting way to develop these skills, which can be transferred to other subjects and even applied in day-to-day life.

In this way, the course will make an excellent preparation for learners who want to study or work in areas that rely on these skills, especially where they are applied to technical problems, for example in engineering, financial and resource management, science and medicine.

Computer Science continues to have a growing importance. This means there will be a bigger demand for professionals who are qualified in this area. If you want to go on to higher study and employment in the field of Computer Science, you will find that this course provides a superb stepping-stone.

You will:

- Understand the function of the CPU and how it operates.
- Understand binary notation and mathematics, produce logic diagrams and truth tables.
- Explore different forms of hardware and software and understand their function and purpose.
- Evaluate and reflect critically on the way you and others use IT.
- Explore and learn about wired and wireless networks.
- Develop coded (programmed) solutions to satisfy various problems.
- Discuss and review the impact of computers.
- Consider the social, legal, ethical and moral issues and security needs associated with Computing.

Assessment is by two exams (100%, each being worth 50%) and a single programming project (non-assessed). The first exam is regarding computer systems, whereas the second looks at computational thinking, algorithms and programming. Computer Science GCSE results are among the highest in the School.

The project is a programming problem to analyse, plan, design, develop, test and evaluate. The project is a substantial coding challenge that varies from year to year.

Who is the course suitable for?

Anyone with an interest in computers, programming or the application of computers in the modern world.

Key Stage Four Curriculum Overview

Year 10

Name of topic	Key Content of the Topic	Cohort assessment points (will also be class specific tests and homeworks)
Computational thinking	Principles of computational thinking: <ul style="list-style-type: none">• Abstraction• Decomposition• Algorithmic thinking	End of topic test
State and logic	<ul style="list-style-type: none">• Simple logic diagrams using operators AND, OR and NOT• Truth tables• Combining Boolean operators• Applying logical operators in truth tables to solve problems	End of topic test
Inputs, outputs and processes	<ul style="list-style-type: none">• Identify the inputs, outputs and process for a problem• Structure diagrams• Identify common errors• Trace tables	End of topic test
Data types	<ul style="list-style-type: none">• Integer• Real• Boolean• Character and string• Casting	End of topic test
The processor	<ul style="list-style-type: none">• The purpose of the CPU• Common CPU components and their function• Von Neumann architecture• CPU Performance and how common characteristics of CPUs affect their performance• Embedded systems	End of topic test
Sequence, selection and iteration	<ul style="list-style-type: none">• Sequence• Selection• Iteration	End of topic test
Storage	<ul style="list-style-type: none">• Primary memory• Secondary storage	End of topic test
Data	<ul style="list-style-type: none">• Units• Numbers• Binary	End of topic test Worksheets

	<ul style="list-style-type: none"> • Hexadecimal • Characters • Images • Sound 	
Searches and sorts	<ul style="list-style-type: none"> • Linear search • Binary search • Bubble sort • Insertion sort • Merge sort 	End of topic test
Compression	<ul style="list-style-type: none"> • Lossy • Lossless 	End of topic test
Programming techniques	<ul style="list-style-type: none"> • String manipulation • File handling • Records • SQL • Arrays • Functions • Random numbers 	Coding task assessments
NOTE: Coding is taught throughout the year		

Year 11

Name of topic	Key Content of the Topic	Assessment points
Defensive design	<ul style="list-style-type: none"> • Design considerations • Input validation • Maintainability 	End of topic test
Testing	<ul style="list-style-type: none"> • Purpose • Types of error • Selecting and using suitable test data • Refining algorithms 	End of topic test
Systems software	<ul style="list-style-type: none"> • Operating systems • Utilities 	End of topic test
Networks	<ul style="list-style-type: none"> • Networks and topologies • Wired and wireless networks • Protocols • Layers 	End of topic test
Security	<ul style="list-style-type: none"> • Threats • Identifying and preventing vulnerabilities 	End of topic test
NEA 1		

IDEs	<ul style="list-style-type: none"> • Common tools and facilities 	End of topic test
Translators	<ul style="list-style-type: none"> • Characteristics and purpose of different levels of programming languages • Purpose of translators • Characteristics of compilers and interpreters 	End of topic test
Ethics	<ul style="list-style-type: none"> • Impacts of digital technology on the wider society 	End of topic test
Laws	<ul style="list-style-type: none"> • Legislation affecting computers 	End of topic test
NEA 2		
Revision		

Recommended Revision Guides for GCSE

Revision Guidance:

- Use the course theory self audit document to recap theory and look for gaps.
- Prepare own summary notes for revision (mind maps or whatever works for you!)

Resources to help:

1. Your Microsoft Team and Class Notebook (OneNote)
2. Microsoft 365 – GCSE Computer Science site – plenty of revision material, including the Student Workbook and ZZ notes.
3. Bitesize GCSE Computer Science website – written by TM.

Support available for GCSE Students

The Python Programming Club supports pupils who are struggling with programming. Programming mentors support pupils.