






## Curriculum Intent for Computer Science at Blessed Robert Sutton Catholic Voluntary Academy

	<u>Overall Aim of Subject</u> By studying Computer Science at Blessed Robert Sutton, all pupils from Year 7 to Year 11 will gain a coherent knowledge and understanding of the development of how technology works and explore programming solutions to broaden individuals to possible career opportunities that Computer Science can offer, this will be explored using the Robert Sutton Way.
	<b>Computer Science</b> will teach <b>spiritual development</b> by pupils being confronted with moral, ethical and legal dilemmas faced in the context of technology. Teaching will encourage pupils to develop an understanding by researching and exploring a number of key scenarios on the spirituality of how humans should use technology, but discuss how it can be used by certain individuals or organisations.
	<b>Computer Science</b> will teach <b>social excellence</b> through a range of teaching strategies that allow opportunities for pupils to work effectively as a community. Class discussions will develop pupils' abilities to work effectively as a team; paired work allows pupils to develop understanding and embed concepts and ideas. Areas of focus are: communicating, respecting, listening and developing each other's ideas.
	<b>Computer Science</b> will teach <b>academic excellence</b> by developing an understanding of the academic rigours of studying Computer Science. Pupils will develop an understanding and appreciation of focus into how all technology is designed, focusing on areas such as hardware, software, networking and the core concept of developing pupils' knowledge and competence in programming. Pupils will use the systems development lifecycle to analyse, design, test and evaluate programs they produce. Pupils will also explore methods of answering different types of exam questions to allow them to succeed.
<b>Enrichment opportunities in this subject include:</b> <b>For example,</b> <ul style="list-style-type: none"> <li>• <b>Curriculum Challenges</b></li> <li>• <b>Programming Projects</b></li> <li>• <b>Computer Science Intervention Sessions</b></li> </ul>	

### Key Stage 3 Course description

Pupils will follow the Key Stage 3 National Curriculum considering further study at Key Stage 4 with the OCR GCSE Computer Science. As a result, the Computer Science Curriculum aims to enable pupils to:

- Develop and enhance their ICT skills using a range different pieces of software 
- Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
- Understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem
- Use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions
- Understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal]
- Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
- Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits
- Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users
- Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
- Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns

## Copy of subject road map to go in here

### Year 7

In Year 7 pupils key enquiry shall be: to understand how to use the computer, ensure all basics are replicated – such as: typing skills, using folders, naming conventions, using basics of Office software to complete certain tasks. The units they will explore are:

- **Digital Literacy unit** – this will focus on areas such as Health and Safety in the classroom, Folders and Saving and E-Safety (Social Media and Cyberbullying).
- **Spreadsheets unit** - this will ensure how to present and apply appropriate formula and functions to a spreadsheet model.
- **Scratch (Block code programming) unit**- this will allow pupils to focus on different scenarios and allow them to develop block code and create running programs. They will explore subject terminology such as: variables, inputs, outputs, if statements and loops.
- **Computer Hardware unit** – this will explore input and output devices connected to the computer system and then focus on internal components e.g. CPU and discuss how they work within the computer system, to complete the actions asked of it.
- **Introduction to HTML Unit** – basic textual programming language for creating a series of webpages to create a simple website.

### Year 8

In Year 8 pupils' key enquiry shall be: 'the further development of programming – textual language Python'

- **Digital World unit** – this will focus on area such as Trusting Sources, Copyright and Staying Safe Online.
- **Binary Bits and Bobs unit** – this will expand on the basic knowledge from the Computer Hardware Unit in Year 7 and discuss the language the computer system understands (Binary) pupils will be exploring Binary Number System (Converting Binary to Denary and vice versa), Adding Binary, ASCII Characters, Bitmap Images and How Computers Represent Sound.
- **Microbits unit**– this will expand further on Scratch block code programming from Year 7 – pupils will be provided with different challenges and pupils using the programming theory knowledge and skills will need to create fully working solutions.
- **Introduction to Python** – pupils will explore a new textual language, this will be used for projects in GCSE. Pupils will see the difference between block code programming to textual language and focus on variables, inputs, outputs, data types and if statements.
- **Web Design Unit** – using the systems development lifecycle – pupils will need to conduct analysis of their chosen topic, develop their project (pupils can explore and incorporate HTML and JavaScript) complete testing and evaluate the final website.

### Year 9

In Year 9 pupils' key enquiry shall be: 'Expanding their knowledge further of programming terminology – to enable access into GCSE'

- **Digital Literacy unit** – this will focus on areas such as Cyber Risks, Protecting Data (Physical and Software), Data Protection Act, Sexting and Grooming.
- **Back to the Future unit** – this will explore Alan Turing and code breaking and exploring Encryption, Sir Tim Berners Lee and the World Wide Web and exploring writing HTML code, George Boole and Logic and exploring Logic Gates and circuits and finally Charles Babbage and problem solving and exploring sorting algorithms.
- **Advanced Python Programming** – programming recap from year 8 and then developing further into while and for loops.
- **Databases** – exploring the concept of basic database terminology e.g. fields, records, data types, relationships etc.
- **Computer Networks unit** – pupils will focus on how technology is networked and discover the basics of LAN and WAN, using the internet and the basics of packet switching.
- **App Development unit** - using the systems development lifecycle – pupils will need to conduct analysis of the brief they are initially provided with, develop their project using Thinkable, complete testing and evaluate their final App.

### Assessments

In KS3 Computer Science pupils will be assessed formatively using a range of peer and self-assessment, as well as through marking and feedback in the form of clear targets and questioning by teachers to ensure consistent progression.

Summative assessment practices at KS3 ensure that there is clear line of progression from KS3 to KS4 the new 1-9 GCSE Grading System. All year groups will be completing a minimum of two SPC's to show knowledge over time as well as end of unit assessments

to test knowledge further. The style of assessment depends on the unit for instance some will be practical on the computer assessments, however a main focus will be on exam technique and written questions to aid in supporting KS4.

### **Ways to help my child succeed**

To support your child speak to them about the topics they are studying in school and encourage them to read around the topic outside of school. There are a range of excellent websites, books and documentaries that will assist with this. Please don't hesitate to contact the department for further ideas.

- Be positive about the benefits of Computer Science
- Help identify uses and roles in industry where Computer Science is used. E.g. Architecture, Engineering, Finance, Art.
- Remind them that Computer Science is designed to make life easier for people and some skills are not as difficult as they may seem.
- Encourage students to complete homework.
- Use websites such as Code Academy to follow coding courses of their choice.
- Encouraging e-safety and the appropriate use of Computer Science
- [www.thinkuknow.co.uk/](http://www.thinkuknow.co.uk/)
- [www.stopcyberbullying.org/index2.php](http://www.stopcyberbullying.org/index2.php)
- Encourage them to find out about the latest technology on the Internet.
- [www.wired.com/](http://www.wired.com/)
- <http://fwd.five.tv/gadget-show>
- [www.technologyreview.com/](http://www.technologyreview.com/)
- [www.bbc.co.uk/learning/subjects/information\\_technology.shtm](http://www.bbc.co.uk/learning/subjects/information_technology.shtm)

## Key Stage 4

The Key Stage 4 Curriculum enables students to study different aspects of technology, focusing on areas such as programming, hardware, software and networking.

### Course description

Content Overview	Assessment Overview	
<b>Computer systems</b> <ul style="list-style-type: none"><li>• Systems Architecture</li><li>• Memory</li><li>• Storage</li><li>• Wired and wireless networks</li><li>• Network topologies, protocols and layers</li><li>• System security</li><li>• System software</li><li>• Ethical, legal, cultural and environmental concerns</li></ul>	Computer systems (01) 80 marks 1 hour and 30 minutes Written paper (no calculators allowed)	50% of total GCSE
<b>Computational thinking, algorithms and programming</b> <ul style="list-style-type: none"><li>• Algorithms *</li><li>• Programming techniques</li><li>• Producing robust programs</li><li>• Computational logic</li><li>• Translators and facilities of languages</li><li>• Data representation</li></ul>	Computational thinking, algorithms and programming (02) 80 marks 1 hour and 30 minutes Written paper (no calculators allowed)	50% of total GCSE
* Algorithm questions are not exclusive to Component 02 and can be assessed in either component.		
<b>Programming Project</b> <ul style="list-style-type: none"><li>• Programming techniques</li><li>• Analysis</li><li>• Design</li><li>• Development</li><li>• Testing and evaluation and conclusions</li></ul>	20 timetabled hours	Formal requirement Consolidates the learning across the specification through practical activity.

### Exam board

OCR Computer Science (J276)

### Past papers

<https://ocr.org.uk/qualifications/gcse/computer-science-j276-from-2016/assessment/>

### Assessments

At KS4, Computer Science pupils will be assessed formatively using a range of peer and self-assessment, as well as through marking and feedback in the form of clear targets and questioning by teachers to ensure consistent progression. Pupils will regularly complete exam questions in lesson and as homework.

### **Summative assessment practices at KS4 result in:**

#### **Year 10:**

- Three SPC Assessments – two equating around 45-55 marks and the mock equating to about 80 marks (exploring content from paper 1 and paper 2 and depending on content coverage)
- End of Unit Assessments

#### **Year 11:**

- Two SPC Assessments – equating to around 45-55 marks (exploring content from paper 1 and paper 2 and depending on content coverage)
- One Mock – previous cohorts official exam papers, each paper is 80 marks.

### **Ways to help my child succeed**

Encourage your child to complete independent revision at home; revising from knowledge organisers, making flashcards, completing past papers and continually reflecting on their work. Ensure that at home there is a quiet place to revise away from distractions. Ensure students have access to 6 A Day, Axised Revision Guide and CGP Computer Science revision guide and are working through the tasks effectively.

### **Useful websites**

- Craig'n'Dave YouTube Videos
- ComputerScienceUK YouTube Videos
- BBC Bitesize – Computer Science