

KS3 Computer Science

Department Vision

To provide high quality education in both the theoretical and applied foundations of Computer Science and Business in order to equip and train students to effectively apply this knowledge to solve real-world problems thus increase their potential for lifelong learning and give them a competitive advantage in the ever changing and challenging global work environment of the 21st century.

Curriculum

KS3: Computer Studies

During KS3, units of work we deliver provide a balanced, appropriate and challenging curriculum in line with the Department for Education. Please see below for our KS3 Scheme of Work.

Key Stage 3

During Key Stage 3, students will be following the national curriculum on Computer Studies throughout Year 7, 8 and Year 9. The units of work we offer (below) follow the national curriculum as well as help students gain a ground knowledge in preparation for Level 2 and GCSE Computer Science for Key Stage 4.

Throughout Year 9, students will gain a taster in Computer Science so that they are able to make an informed decision for Key Stage 4. Please see our Key Stage 4 page for more information about Computer Science at KS4.

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 7	Hardware & Software	Control Systems with Flowal	Computer Networks	Scratch Programming	Algorithms – Searching & Sorting	E-Safety
Unit Overview	During this unit of work, students will gain an introductory understanding of the physical components that make a computer system. Students will also be introduced to the different forms of operating systems across different devices and different forms of software.	During this unit of work, students will gain a basic understanding of an algorithm and will put this into practice using software to create flowcharts for different systems. This includes creating flowcharts for traffic light systems, automated controls for a simulated house and more.	During this unit of work, students will gain an introductory understanding of what a computer network is, how a network is formed, the hardware used to build a network and how the Internet and the WWW works.	During this unit of work, students will gain an introductory and basic understanding of what programming is, how to create robust programs and gain skills in analytical thinking. This unit of work will further students' understanding of algorithmic thinking.	During this unit of work, students will further their understanding of algorithms and improve their algorithmic thinking. Students will also understand what algorithms are used for searching and sorting data on computer systems and how they work.	Students will gain understanding of the different dangers that exist on computer systems and the internet. Students will investigate different scenarios and will be able to provide their opinion on different issues. Students will also have the opportunity to explore different types of malware and how these can be a danger on computer systems.
Assessment	W/B 01/09/2021 End of unit assessment	W/B 01/10/2021 End of unit assessment	W/B 05/01/2022 End of unit assessment	W/B 21/02/2022 End of unit assessment	W/B 19/05/2022 End of unit assessment	W/B 06/06/2022 End of unit assessment
Year 8	Hardware & Software	Number Systems and Logic Gates	Computer Networks	E-Safety	Introduction to Python	HTML Programming

Unit Overview	<p>During this unit of work, students will further their understanding of hardware and software and delve deeper into the different types of storage components and their purposes in a computer system. Students will also gain a basic understanding of different utility software that exists in an Operating System.</p>	<p>During this unit of work, students will gain an understanding of what number systems are used on a computer system and how number systems are used to represent data. Students will also understand how to convert between number systems into a human readable format. Students will also gain a basic understanding of what logic gates are and how to create logic diagrams.</p>	<p>During this unit of work, students will further their understanding of computer networks to a more advanced level, with a stronger focus on hardware, topologies and addressing. Students will also have the opportunity to revisit content from Year 7.</p>	<p>During this unit of work, students will gain a further understanding of the dangers involved on a computer system. Students will delve deeper into privacy issues on social networks, different types of attacks carried out on computer systems and networks.</p>	<p>During this unit of work, students will gain an introductory and basic understanding of the Python programming language. Students will have the opportunity to create basic programs in Python which will further their skills of algorithmic thinking and gain a basic understanding of variables, sequencing statements, selection statements and iteration statements.</p>	<p>During this unit of work, students will gain an introductory and basic understanding of HTML programming to make basic webpages. Students will have the opportunity to create websites and explore a range of different templates.</p>
Assessment	W/B 01/09/2021 End of unit assessment	W/B 01/10/2021 End of unit assessment	W/B 05/01/2022 End of unit assessment	W/B 21/02/2022 End of unit assessment	W/B 19/05/2022 End of unit assessment	W/B 06/06/2022 End of unit assessment
Year 9	Data Representation	Logic Gates & Truth Tables	Python Programming (PRIMM)	Algorithm - Sorting & Searching	Systems Architecture	Networking & Security

Overview	<p>During this unit of work, students will re-visit number systems and understand how binary is used to represent different types of data on a computer system such as images, sound and characters. Students will have the opportunity to decipher binary into these different forms of data.</p>	<p>Students will gain an understanding of the different logic gates and their truth tables. Students will be able to create different logic circuits given an equation. This unit of work will teach the students how the Logic gates are used to make decisions so that electrical outputs only 'turn on' when the correct logic sequence has been applied.</p>	<p>During this unit of work, students will further their programming skills continuing to use Python to further enhance their algorithmic thinking and programming skills. Students will gain a further understanding of different data types used, creating and using functions. They will use the Turtle function to draw various shapes and pictures as different challenges are given.</p>	<p>Students will gain an insight into how a computer carries out a search and a sort. Initially they will start off with a Binary and Linear search and then move on to Bubble sort, Insertion sort and Merge Sort. Searching will teach the students to find an item in the array that meets some specified criterion. Sorting will teach them to rearrange all the items in the array into increasing or decreasing order.</p>	<p>Students will gain a basic understanding of the components in a computer system, and understand the finer details of the CPU. Students will also explore different storage mediums and will be able to compare the characteristics of these.</p>	<p>Students will gain an understanding of the different types of network threats, they will learn to investigate each threat and will be challenged to come up with possible methods to prevent each threat. It will also go on to cover different protocols used by computers as a set of rules to communicate with each other.</p>
Assessment	W/B 01/09/2021 End of unit assessment	W/B 01/10/2021 End of unit assessment	W/B 05/01/2022 End of unit assessment	W/B 21/02/2022 End of unit assessment	W/B 19/05/2022 End of unit assessment	W/B 06/06/2022 End of unit assessment

What Eastlea has been involved in:

In December 2015, Eastlea pupils attended an “hour of code” at 10 Downing Street to teach Nicky Morgan (former education secretary) and David Cameron (former Prime Minister) some basic computer programming. Students had the privilege to accompany the teachers to visit the Prime Minister and the Education Secretary, this has no doubt helped the students to:

- Meet MPs to teach them about computer programming
- Demonstrate the impact of STEM on education
- Development of confidence.
- Develop aspirations for leadership, reaching as far as senior politicians.

Eastlea students have been involved in Microsoft BETT conference

Students took part in an event, representing the school presenting and teaching use of technology to teachers and business at BETT. They manned a stand (table) showcasing what they’ve learnt using the Micro:bit and also demonstrating some of the things that they’ve built, such as robotic cars, hover crafts, fans, electronic arm, all controlled by the Micro bit.

In January 2017 Eastlea students took part in the Mosaic Enterprise Challenge. Founded by HRH The Prince of Wales, Mosaic inspires young people to realise their talents and potential. The Enterprise Challenge is designed to bring together business mentors and students to champion the talent, skills and energy found in our local community.

Volunteers from Barclays teamed up with Mosaic to mentor our Year 9’s as part of the flagship Mosaic programme to demonstrate the many benefits of business competition. During the Challenge, 57 students competed in an online business simulation game, and completed a module about ethical business and sustainability. The winning team virtually raised over £2.7 million during the day.

This has helped students to Network with and learn from professionals from the finance field and academic high achievers.

Students put in practice their knowledge in the simulation game and saw the type of funds that can be garnered from various types of investments.

CEO of Microsoft visits Eastlea

In November 2015 Microsoft CEO Satya Nadella visited Eastlea Community School for the launch of the BBC Micro:bit, as Eastlea was one of the first schools in the entire country to get their hands on this new device. He met with staff and students to see how they have been inspired into coding and creativity by the BBC Micro:bit. He was joined by the BBC’s Director General, Lord Tony Hall. They were both equally impressed with the computational thinking and programming skills of Eastlea year 7’s. The students at Eastlea then turned their hand to broadcast journalism by creating a video as part of the BBC News School

Report:

Students then travelled to [Future Decoded](#) where they took up residence of the Microsoft in Education stand to show to the other attendees how they had used TouchDevelop to program their BBC Micro:bits to be able to do different kinds of innovative and wonderful ideas. A lot of the creations involved integrating the BBC Micro:bit with other objects and devices, giving the students first-hand experience of how they themselves can help to shape the emerging revolution of computers.

Eastlea Computing teachers have helped the BBC to plan a series of lessons about Computer Science and students from Eastlea have taken part and were filmed. You can see our students taking part in the lessons we planned here

<http://www.bbc.co.uk/programmes/articles/3ydvd6mvhl89cHVJ7F2nmzf/doctor-who-and-the-micro-bit-live-lesson>

Useful links for Independent Learning and revision:

Course specification

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

Craig and Dave

<https://www.youtube.com/channel/UC0HzEBLIJxlrwBAHJ5S9JQg>

Learn Python

<http://www.pythonschool.net/>

Resources

<http://mrfraser.org/>

To practice Python programming

<https://snakify.org/en/>

Online Revision Notes and Practice Questions

<https://www.senecalearning.com/>

Computer Science Resources

<http://teach-ict.com/>

BBC Bitesize

<http://www.bbc.co.uk/schools/gcsebitesize/>

Cambridge Elevate

<https://elevate.cambridge.org/elevate/>

Online Python

<https://repl.it/languages/python3>

Coding on different platform

<https://trinket.io/>

Academic Intervention

- **1:1 Support**
- **Google Classroom Support**
All lessons and worksheets in lessons are uploaded to Google Classroom where students can access all of the content including the majority of the resources from the Revision Packs above and additional resources. Students can also communicate with teachers outside of the classroom using Google Classroom for extra support.
- **Monitoring**
Regular monitoring of students carried out through termly cycles, Narrowing the Gap and Curriculum Meetings to identify underperforming students so that relevant interventions can be put in place.
- **Personal Enrichment / Extra-curricular**

- o Enrichment clubs for all years once a week.
- o Study Clubs for Year 11 once a week.

Contact Details

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