Computing at The Hurlingham Academy

Programme of study for KS3

Subject overview 2024-25

The Hurlingham Academy
The best in everyone™
Part of United Learning

Summary of intent

Good computing capability is an essential skill for life in today's digitalised world. Used safely and correctly, computing can enable children to improve their learning and eventually participate fully in a rapidly changing society. Using the internet safely and well for example, can give children rapid access to ideas and experiences from a wide range of people, communities and cultures thus promoting inclusion as well as enriching life.

The new national curriculum for computing has been developed to equip young people with the foundational skills, knowledge and understanding of computing they will need for the rest of their lives. Throughout their time at The Hurlingham Academy, children will learn how computers and computer systems work, they will design and build programs and they will develop their ideas using technology and create a range of content. With the rapid growth of Artificial Intelligence we are particularly committed to teaching pupils how to use technology responsibly. In tomorrow's market place some pupils will flourish as programmers and engineers, but all pupils will need to possess a confident command of technology, including staying safe online and using technology for good.

The aim of this course is to develop and promote pupils' curiosity, interest and enjoyment in computing and to encourage pupils to have open, enquiring minds and to perceive computing in the context of a wider body of knowledge. Pupils should ideally become autonomous users of ICT with the associated skills supporting lifelong study, the pursuit of personal interests and the potential of careers in computer science. Our vision is for our students to have the depth of knowledge and understanding in computing that means they are equipped as adults to engage healthily with the internet and to have the skills that enable them to confidently adapt as knowledge and technology evolves.

Computing at The Hurlingham Academy is delivered against the National Curriculum for computing and we ensure that students at Key Stage 3 and Key Stage 4 have opportunities to study aspects of information technology and computer science at sufficient depth to allow them to progress to higher levels of study. In our outgoing 2023 Y11 cohort, pupils went on to study post-16 qualifications in computer science, ICT and Digital

Technology, as well as a T Level in Digital Production, Design and Development. Computer Science remains a popular A Level choice with each successive Y11 cohort.

The bulk of the KS3 computing offer at The Hurlingham Academy comes through drop-down days, induction, assemblies, workshops and the PSHCE curriculum. This model has been chosen due to the quality of the experience that is created as a result of the extended time allocated. Students are able to retain more computing knowledge from extended drop-down days, which include individual computing work, group based projects and visiting computer scientists and workshop coordinators, due to the memorable and enjoyable experience created. In addition, while computing is rightly taught discretely, our timetabled curriculum provides pupils with the building blocks for success in computing, not least because mathematics and physics are particularly strong subjects for us.

In summary, a wide range of assemblies, workshops, projects and trips, alongside lessons on Drop Down Days, ensure that computing is embedded into life at The Hurlingham Academy in a meaningful and measured way.

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"It was the computational thinking that we did in maths that made me think about computer science as a degree. Simple things such as converting between binary and decimal, carrying out simple operations and exploring Boolean logic in conjunction with Venn diagrams. These were the topics I liked best, even from Year 7."

Noe De La Croix, The Hurlingham Academy alumni and third year Computer Science student at The University of St. Andrews

Juliette Quinton
September 2024

Curriculum for KS3 Computing: Y7

Topic and careers link	Knowledge	Skills	Curriculum Time
Introduction	· Why study computing? · Networks and logging in securely · File management · Cloud computing and VLE · E-mail	· Logging on to a computer. · Choosing a secure password. · Saving and retrieving documents. · Accessing online homework platforms such as Sparx and Seneca. · Sending an email.	Y7 Induction: September
Unit 1: 'I am a digital citizen'	· E-safety · Dangers online, e.g. malware, phishing · Bias and reliability · E-waste · Digital divide	· Demonstrate safe and responsible use of computers · Understand how to protect their identity online · Recognise inappropriate conduct, contact and content and know how to report concerns · Recognise ethical issues around IT	Y7 PSHCE: Health and well-being unit
Unit 2: 'I am a hardware engineer'	· Input, output and peripheral devices · Software applications · System architecture · Fetch-execute cycle · Embedded systems	· Use a range of input and output devices · Recognise main internal components · Ordering storage units · Number conversion skills · Converting binary to deanery and back	Drop Down Day 1
Unit 3: 'I am a digital citizen'	· Introduction to Microsoft Office and software: - Word - Excel - PowerPoint	· Writing a Word document using word processing skills. · Fundamental Excel skills - creating a spreadsheet. · Using PowerPoint - creating a PP presentation.	Drop Down Day 2
Unit 4: 'I am a systems analyst'	· Boolean operators and the IF and COUNT functions · Big data	· Understanding the logic between binary and boolean logic. · Improving fluency in Excel · Using functions such as sum, average, max, min and count. · Formatting · Modelling	Drop Down Day 3

Curriculum for KS3 Computing: Y8

	Knowledge	Skills	Curriculum Time
Unit 1: 'I am a graphic designer'	· Vector graphics · Create effective Vector graphics · Memory and storage · Combining photos to create meaning · The importance of audience/purpose	· Use a range of software editing programmes such as Inkscape and Google Draw. · Image search techniques. · Exporting to different formats. · Effective design features.	Y8 Induction
Unit 2: Computing past, present and future	· The history of word processing · The internet · Moore's Law	· Using word-processing software including Microsoft Word and Google Docs. · Creating mind maps, flow charts and reports using a range of word processing interfaces.	Y8 PSHCE: Wider World unit
Unit 3: 'I am a systems analyst II'	· Algorithms · Algorithmic thinking · Precision and sequencing · Pseudocode and flowcharts	· Express simple linear (non-branching) algorithms symbolically · Design simple algorithms using loops and selection, e.g. 'if' statements · Use problem solving and logical reasoning to predict outcomes.	Drop Down Day 1
Unit 4: 'I am a graphic designer II'	· Bitmap graphics · The ethics of image manipulation. · Edit Bitmap photos · Combining photos to create meaning · The importance of audience/purpose	· Use a range of software editing programmes such as Adobe and GIMP. · Image search techniques. · Photo editing and image manipulation. · Exporting to different formats. · Effective design features.	Drop Down Day 2
Unit 5: 'I am a computer programmer'	· What is programming? · What is a programming language? · Data types · Sequencing, selection and iteration using Scratch (Low ability).	· Create a simple program in an environment that does not rely on text · Detecting and correcting errors i.e. debugging, in algorithms. · Use logical reasoning to predict the behaviour of programs.	Drop Down Day 3

Curriculum for KS3 Computing: Y9

	Knowledge	Skills	Curriculum Time
Unit 1: 'I am a cyber-security specialist'	· Social engineering techniques · Malicious code and pharming · Weak and default passwords · Misconfigured access rights · Removable media · Unpatched and/or outdated software	· How to identify a fake website · How to identify a phishing email. · How to create a strong password (recap). · Understand penetration testing and how to respond. · Application of appropriate security measures to different scenarios.	Y9 Induction
Unit 2: 'I am a cyber-security specialist II'	· Legislation including The Computer Misuse Act, Copywriter and Data protection · Forms of attack including phishing, malware and hacking. · Security methods to reduce risks.	· Understand the law on cyber-security · How to identify if a law has been broken. · Application of appropriate security measures to different scenarios.	Y9 PSHCE: Wider World and Life Skills units.
Unit 3: 'I am a game designer'	· Using sequence, selection and iteration in algorithms · User controlled movement and computer controlled movement. · Positions and coordinates · Variables · Sensing · Broadcasts	· Serif Drawplus · Problem solving · Computational thinking · Scratch software (Low ability)	Drop Down Day 1
Unit 4: 'I am a computer programmer II'	· Assignment of variables in Python · Output and user input · Data types · Mathematical operators · Comparison operators · Use of arrays · Selection statements · Simple debugging	· Programme design · Syntax accuracy · Problem solving · Error checking · Independent thinking	Drop Down Day 2

Unit 5: 'I am an app developer'	· Effective icon design · Successful advertising · Creating digital adverts	· Working to a client brief · Mind maps and mood boards · Using multimedia with different platforms.	Drop Down Day 3

Enrichment and Extra-curricular opportunities

All students in Key Stage 3 have a computing assembly in terms 1 and 2.

	Assemblies
Year 7	Healthy use of social media - Hammersmith and Fulham Mind Working in computing - Tom Duckering, Senior Engineering Manager, Apple
Year 8	Healthy use of social media - Hammersmith and Fulham Mind Computing at university - Onime Odusino, post-graduate in computer science at Imperial College
Year 9	Girls in STEM - GSMA Working in Cyber security - Samantha Kight, Head of Industry Security, GSMA

All students in Key Stage 3 have a day long workshop in terms 1 and 2.

	Workshops
Year 7	Creating a Google Voice Box (raspberry pi) - In house STEM day: Creating an autonomous vehicle - The Smallpiece Trust. Students complete the autonomous vehicle challenge in which they design, build and programme their own driverless vehicle Staying safe online - Arc Theatre group
Year 7	How to create basic code: Tom Duckering, Senior Engineering Manager, Apple
Year 8	STEM day: Creating an autonomous vehicle - The Smallpiece Trust. Students complete the autonomous vehicle challenge in which they design, build and programme their own driverless vehicle Staying safe online - Arc Theatre group

Year 9	Build an App' - students build an app using app-maker software and led by GSMA. CyberFirst Defenders - online course for students from diverse backgrounds. CyberFirst Defenders increases students' awareness of cyber security. It also helps students visualise themselves in a cyber security career, guiding them to the technology-related qualifications they'll need.

All students in Key Stage 3 go on a computer science based trip during term 3.

	Trips and Visits: Summer term
Year 7	The Science Museum - the 'Power Up' gaming exhibit and the Computers collection.
Year 8	London Robotics School - Talk and workshop on robotics and the future of AI
Year 9	Bletchley Park and The National Museum of Computing - a visit to understand the history of the allied code-breaking during WWII.

Other opportunities

Coding Success

The Hurlingham Academy has registered as part of 'Coding Success'. This is a programme for Y8 and Y9 students to learn computer programming using LEGO® Education SPIKE™ Prime kits. It is fully funded by BAE systems and the Royal Air Force and provides teacher training for the staff member leading the programme.

KS4 Cyber First Courses

These are courses for Y10 and Y11 students introducing them to cyber security. It is led by the National Cyber Security Centre (NCSC), a part of GCHQ. Each course is designed to encourage students from all backgrounds to consider careers in cyber security, offering them the support, skills, experience and exposure needed to go onto careers in computing. These CyberFirst Defenders courses have been certified by the NCSC. Students apply for these through the careers lead. Students apply for these at the end of Year 9.