Henlow Academy Computing Curriculum Information

Intent	Implementation	Impact
Key Stage 3 The focus at the start of a student's Key Stage 3 journey is to ensure that all students are fully aware of how to be safe online and understanding their digital footprint. Although this is studied at a primary level, our unit gives them a stronger understanding of how it affects them at their current age and as they progress throughout secondary school. We explore student's previous learning and build upon this to ensure students make sensible choices. We have a key theme of personal data, protecting data and understanding the use of technology and ICT in the world through Y7 and this is further developed throughout KS3. Outside of the taught curriculum, the Computing Department also has a promise to all students that at the end of their Henlow Journey, they will have the necessary life skills and practical skills to be responsible users of digital technology, thus being productive, safe and mature digital citizens. Students will also develop their programming knowledge of Sequencing, Iteration and Selection.	Key Stage 3 To support our aims, at KS3, students will cover Digital Citizenship in each year. This will be both leading up to and during Safer Internet day. The department works closely with PSHCE to further explore areas around sexting, sexual harassment, cyberbullying and other areas that are of particular concern to our student body. Every year, there is a renewed 'whole school' Digital Citizenship survey which feeds into understanding the needs of our students. Parents are an important stake holder in this too. With regards to the curriculum, our units of work explore many aspects of personal data and the need to protect. Through units like Networks and Representation we continue to discover the importance of data transmission and threats to data.	Key Stage 3 Regular learning walks within the faculty are conducted to ensure high quality teaching and delivery is being provided to learners. Student voice is used to survey the impact of the KS3 Computing Curriculum, the outcomes allow us to reshape and restructure the curriculum to maximize student learning, outcomes and enjoyment. Every student at the end of KS3, whether continuing with KS4 Computer Science or not, will have the necessary skills to become a responsible user of technology both offline and online. Students will know how their use of technology can impact them both in the present and particularly in the future, particularly through the way they conduct and represent themselves online through social media.

Henlow Academy Computing Curriculum Information

Intent

Key Stage 4

Understand and apply the fundamental concepts and principles of Computer Science
Analyse problems in computational terms through practical problem solving experience
Enable learners to think creatively, innovatively, analytically, logically and critically
Understand the components that make up digital systems and how they communicate with one another
Understand the impacts of digital technology to the individual and wider society
Apply mathematical skills relevant to Computer Science

Impact

Key Stage 4

In Computer Science, we aspire to enrich students with a varied and deep understanding of computing developments, concepts and the impact of technology on our society and environment. At the end of their course here at Henlow Academy, our students will have a diverse range of skills such as programming in a high level language and have a strong knowledge of theory being the science of computing, the internet and the ever growing importance of our personal security and privacy. Ultimately, we aim to give students the knowledge and experience they need to study Computing at a higher level. Students will know how to use technology safely, the part it plays in society for good and the worse and ultimately possess the skill and knowledge to compliment any future study in the subject.

Implementation

Key Stage 4

A range of visual, auditory and kinesthetic resources are used throughout lessons
Create an environment of confidence where students feel they can experiment, make mistakes and develop their skills in an independent manner
Regular use of teacher and student led live modelling to demonstrate processes and applications both practically and theory based
Experience a wider range of block based and script based languages to develop transferable programming skills.

Students will also work independently through the Know It All Ninja course content to further aid their recap and revision of topics covered in class. The curriculum at Key Stage will also make use of national initiatives such as Safer Internet Day and making links with units such as Impact of Digital Technology and Network Security. This will have further connection with their wider understanding of how to be a good Digital Citizenship and making safe use of technology online.

The department makes a commitment to:
Establishing cross curricular links.
Encouraging students to contribute to the life of the school and the community through promoting student voice information and guidance on online safety.
Developing partnerships with external providers that extend children's opportunities for learning.
Encourage students to engage in culture capital wider reading of current affairs about how the content they are learning exist and shape the world we live in.

Year 7 Curriculum Plan

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Theme	**ICT Functional Skills**	**Digital Citizenship**	**Kodu Game Development**		**Graphics**	**ICT in Business**
Key Concepts	• Cyber Security – Understand the need to set strong passwords • Identity Theft and Big Data • Understanding the Henlow IT Platforms – Edulink and Google Classroom	• Understand the need to 'Pause for People' and needing to have 'Device • Free Moments' • Understand how to be 'Upstanders and Allies' • Taking Action Against • Cyberbullying • Finding Balance in a Digital • World • Understanding Big Data and Phishing	• Students will beginning developing their game idea developed in Unit 2 Algorithms. • Creating a playable world • Programming interactive elements • Students will learn the following concepts: • Variables • Iteration (Loops) • Selection (If Statements) • Flowcharts and Alogirthms Kodu also requires students to create a 'creator id' and 'pin'. They will learning about Data Protection Actt		• Introduction to vector and bitmap graphics. • Exploring the range of graphic file types. • Developing graphics using available tools. • Creating digital artefacts for promotion of their Kodu game	• Exploring a range of ICT tools used in Business. • Designing and developing a business brand • Creating a variety of business documents. • Understanding the use of IT in business and basic security. Membership Letter • Membership Card • Poster
SMSC and British Values	Students will learn the how to be a Henlow Digital Citizen. They will develop an understanding of ICT platforms within the school and how to stay safe when using these systems. This is a vital life skills unit where they will apply their knowledge to ever day life in their use of devices.	Understanding their role and how to become a positive Digital Citizen. From how to conduct themselves online, to identifying threats and dangers and knowing how to report online dangers, students will have the life skills to be safe online. This unit is inline with Safer Internet Day	Online Gaming plays a big role in the lives of young people. The previous two units will have laid the foundations of identifying how to stay safe online, including positive relationships when playing online, chat rooms etc. Students will begin to use their pre-existing knowledge of the gaming world and begin to develop their own game. Through this unit they will have further knowledge of data protection, big data, legislation when creating their accounts for Kodu. Through this unit they will then have an introduction to programming concepts through a fun and creative visual platform.		Continuing with the theme of big data, students will be introduced to topics such as cookies, advertising, particularly personalised adverts online. They will then create a set of promotional materials to feature on 'social media' and printed medium.	They will create a company identity for their Kodu Game. This will include a plan for a social media account, a business card and a digital video billpoard poster. Enable students to acquire a broad general knowledge of and respect for public institutions and services in England
Parental Support	Where possible, providing students access to: • Edulink • Gmail • Google Drive and Classroom Via AppStore/Google Playstore	Encourage discussions at home. Watch the following video resources: Media Balance Start a conversation What is Screen Time?	Encourage discussions at home. Watch the following video resources: Responsible Use of Technology for Kids Computer Science Basics: Sequences, Selections, and Loops Kodu is a free to download software on PC and Laptop		Encourage discussions at home. Watch the following video resources: How targeted adverts work	

Year 8 Curriculum Plan

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Theme	**Digital Citizenship**	**Data representation**	**Networks**	**Cybercrime & security**	**Computer components**	**Computational Thinking using Python and Scratch**
Key Concepts	• Countering Hate Speech Online and Consequences • Who is looking at your Digital Footprint • The Health Effects of Screen Time • Social Media and How you Feel/Can Media be Addictive	• Exploring binary and its use in computing. • Converting between binary and denary. • Investigating ASCII and unicode.	• Introduction to computer networks. • Developing an understanding of network topologies. • Exploring wired and wireless communications.	• Introduction to cybercrime. • Developing an understanding of cybercrime threats such as phishing. • Exploring methods to protect against such crimes.	• Introduction to the main components of a computer. • Exploring software • classification	• Introduction to python programming language. • Exploring the use of strings, variables and data types. They will look at simple python code and use Scratch to build a simple game..
SMSC and British Values	The unit will look at the conduct of students online and on their devices. Learners will feel more empowered to be able to make the right choices when things become challenging on their devices. Being kind and tolerant of other peoples views are a key aspect when learning about online hate speech, touching on core British Values.	Building on the concept of online data and data protection from Year 7 and the various instances students learn about this, this unit covers an understanding of how data is transmitted through the network. It build a core understanding of what types of networks exist in order for data to flow through them. The history of the internet is covered and students will begin to look how wired and wireless connection, developing fundamental knowledge of a key aspect of their personal technological lives. Learners will also build on their understanding of secure networks, how the school is set up and how they are a key stake holder in a network.		Once students have learnt about networks and the way data is transmitted, they will further understand the threats they face online, other than cyberbullying and online grooming/social media. They are young people who have a big digital footprint. Learners will have a better understanding of cyber threats and know how to protect and void from such threats. The unit also covers understanding both physical and non physical protection methods. Once students have grasped the themes of Cyber Crime and Security, they will begin to understand how computer parts can be manipulated by cyber criminals. They will begin to understand the different parts of a computer, no only within a traditional PC or Laptop but also within embedded systems and every items when it comes to Internet of Things. We cover devices such as Ring Door Bell Apps, again a look at cyber crime and hacking, the threats to our wifi and overall network of household if more and more devices are connected online		
Parental Support	Watch the following video resources: Hate Speech Media Balance Start a conversation What is Screen Time?	Begin to discuss digital footprint of students. The importance of not sharing their data openly or where they are sharing there data. Personal Data vs Sensitive Data The Ethics of Data		Understanding how to protect yourselves online and protecting against cyber criminals. Understanding the importance of physical and technical protection of our devices. Stopping Cyber Criminals Teenage Cybercrime Threats to networks		

Year 9 Curriculum Plan

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Theme	**Data Representation**	**Networks**	**Digital Citizenship**	**Computer Systems**	**Introduction to Python and Python Next Steps**	
Key Concepts	• Exploring binary and its use in computing. • Converting between binary and denary. And building on Year 8 to then convert with HEX • Binary Addition • Compression Lossy and Lossless Developing an understanding of how images and sound are represented in binary.	• Data Transmission, buffering, download and upload, file size building on from Data Representation • Network Protocols • Network Security	• Sexual Harassment (Online) • Sexting • Personal Information and Digital Footprint • Additional themes through Safer Internet Day	Introduction to hardware and software. Exploring hardware components, including the range of storage mediums. Investigating software classification.	Introduction to python programming language. Exploring the use of strings, variables and data types. Developing an understanding of selection, iteration and sequencing Students will also look at flowchart and planning to create their own working program. Functions, Variables, Array and File Handling	
SMSC and British Values	Building on the concept of online data and data protection from Year 7 and 8 and the various instances students learn about this, this unit covers an understanding of how data is transmitted through the network. It build a core understanding of what types of networks exist in order for data to flow through them. The history of the internet is covered and students will begin to look how wired and wireless connection, developing fundamental knowledge of a key aspect of their personal technological lives. Learners will also build on their understanding of secure networks, how the school is set up and how they are a key stake holder in a network.		Throughout Year 7 and 8, students will have covered what it means to be a Digital Citizen and understand the tools and life skills needed to ensure they both keep safe, and know how to deal with a situation if they find themselves at risk to any of the dangers previously covered. The Spring and Summer term will have a focus on the Digital Citizenship themes of Sexual Harassment, Sexting and how to manage and cope with coming across material on social media which, inadvertently might have come across their feeds and caused offense or upset. As is the manner of these things, no one can truly control or full protect a young person, all we can strive to do is to ensure every one of our students has the life skills in order to be able to make that choice to protect themselves when a situation arises. Whilst in lesson students will learn Computer Systems and Python, the summer term will consist of homework tasks based on this years themes which will not only be accessed by subject students but also the wider year group through PSHCE and tutor based activities		
Parental Support	Begin to discuss digital footprint of students. The importance of not sharing their data openly or where they are sharing there data. Personal Data vs Sensitive Data The Ethics of Data		It's Not Okay ThinkUKnow – Young people sharing pictures and videos online Personal Data vs Sensitive Data	Hardware and Software – BBC Bitesize	What is Python Programming? W3 Python Online Tutorial Programming Glossary of words	

Year 10 Curriculum Plan

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	COMPONENT 02				COMPONENT 01	
Theme	**Unit 6** Fundamentals of Algorithms	**Unit 7** Fundamentals of Programming	**Unit 8** Fundamentals of Logic and Languages	Programming Portfolio	**Unit 3** Networks Connections and Protocols	**Unit 4** Networks Security and Systems
Key Concepts	• Representing algorithms • Efficiency of algorithms • Searching and sorting algorithms • Data types • Arithmetic, relational and Boolean operations	• Programming concepts • Data structures and handling files, strings etc in programming. • Structured, robust and secure programming • Classification of languages.	• Developing their learning of Logic Gates • Being able to complete Truth Tables and Trace Tables • Difference between Compiler and Translator • Assembly Code vs Machine Code	• The programming project allows students to develop their practical skills in a problem solving context by coding a solution to a given problem and producing a report documenting the development of the solution.	• What is a network? • Types of networks • Wired and wireless networks • Network topologies • Network protocols • Network security • TCP/IP model	• Cyber security threats • Social engineering • Malicious code • Detect and prevent cyber security threats. • Encryption • Caesar Cipher
SMSC and British Values	Democracy All pupils within Computing are encouraged to promote British Values; to work as a team when asked; and individually respecting others when producing coursework. Resilience is a must when programming code and the key skill of computational thinking is developed when problem solving. The programming and algorithms unit requires a lot of pupil feedback and contributions and the classroom teacher will always promote a safe classroom environment where students can have a go, and have the confidence to get it wrong, to fail and learn from one others feedback on their program				Debate: In all lessons, students consider the consequences, advantages and disadvantages of things such as hacking, cyber bullying, privacy, ethical decisions relating to how ICT is used and abused as well as computer science related crime. Rules and Law: adhering to rules and laws of the privacy and understanding of how such legislation is applicable to life in school and the community in helping to make the community safer.	
Parental Support	Craig and Dave Algorithm playlist on Youtube	Craig and Dave Programming Fundamentals playlist on Youtube	Craig and Dave: Logic Diagrams Truth Tables	W3 Python Online Tutorial	Craig and Dave Computer Networks, connections and Protocols	Threats to Network Preventing Vulnerabilities

Year 11 Curriculum Plan

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	COMPONENT 01		REVISION			
Theme	**Unit 5** Impacts of digital technology **Unit 2** Data Representation	**Unit 1** Systems Architecture	**GCSE Revision for Summer** **Past Paper/Examination Technique**			
Key Concepts	**Unit 5** Ethical, legal and environmental impacts of digital technology on wider society, including issues of privacy Aspects of software development, including design, implementation, testi ng and evaluation. **Unit 2** Number bases and conversions between. Units of information Binary arithmetic Character encoding Representing sound and images.	• Von Neumann Architecture • CPU • RAM vs ROM • Storage devices • Fetch Decoe and Execute Cycle	**Unit 1** Systems Architecture **Unit 2** Data Representation **Unit 3** Networks Connections and Protocols	**Unit 4** Networks Security and Systems **Unit 5** Impacts of digital technology **Unit 6** Fundamentals of programming	**Unit 7** Fundamentals of Programming **Unit 8** Fundamentals of Logic and Languages	**NOT IN SCHOOL**
SMSC and British Values	Equality and Diversity: At all times within the subject, students are encouraged to recognise an individual's strength and support their development. Students are encouraged to embrace diversity and treat all others with respect both in and out of the classroom Character: An underpinning drive to develop students who are resilient, respectful, determined and respectful in Computer Science creates a positive set of values to apply to all areas of life. This is consistent across all subjects. Certainly achieved through Unit 5		Students will be conducting revision through teacher led lessons and their own independent revision.			
Parental Support	Craig and Dave Impact of Digital Technology Compression	Craig and Dave Systems Architecture	Revision Material CGP GCSE Computer Science Revision Guide Revise and Practice Guide Collins Revision and Practice Revision Question and Content Flash Cards			

Assessment Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7	End of Unit Assessment Unit 1 Functional Skills	End of Unit Assessment Unit 2 Digital Citizenship	End of Unit Assessment Unit 3 Kodu Games Development (end of Spring 2)		End of Unit Assessment Unit 4 Graphics	End of Unit Assessment Unit 5 ICT in Business
Year 8	End of Unit Assessment Unit 1 Digital Citizenship	End of Unit Assessment Unit 2 Data Representation	End of Unit Assessment Unit 3 Networks	End of Unit Assessment Unit 4 Cybercrime and Security	End of Unit Assessment Unit 5 Computer Components	End of Unit Assessment Unit 6 Computational Thinking and Programming
Year 9	End of Unit Assessment Unit 1 Data Representation	End of Unit Assessment Unit 2 Networks	End of Unit Assessment Unit 3 Digital Citizenship	End of Unit Assessment Unit 4 Computer Systems	End of Unit Assessment Unit 5 Introduction to Python	End of Unit Assessment Unit 6 Python Next Steps
Year 10	End of Unit Assessment **Unit 6** Fundamentals of programming	End of Unit Assessment **Unit 7** Fundamentals of Programming	End of Unit Assessment **Unit 8** Fundamentals of Logic and Languages	Programming Portfolio: Students will also sit their Year 10 Mock exams during this window.		End of Unit Assessment **Unit 3** Networks Connections and Protocols
Year 11	End of Unit Assessment **Unit 5** Impacts of digital technology **Unit 2** Data Representation	End of Unit Assessment **Unit 1** Systems Architecture	Revision leading up to Year 11 GCSE Examinations			