FRAMEWORK FOR LEARNING

CHS South

CREATIVE An education where imagination, curiosity and resilience enable us to ignite our learning.

HAPPY A shared belief that optimism, empathy and responsibility are the foundations for a respectful, safe and inclusive community.

SUCCESSFUL Individuals who are ready to learn, practise being reflective, and are motivated to become champions.

SUBJECT COMPUTER SCIENCE

INTENT

Studying Computer Science will help develop problem-solving, critical thinking and analytical skills. Computer Science is found in nearly all jobs and careers. Studying Computing will provide students with a versatile foundation for many different careers and allows students to develop interchangeable and transferable skills inside and outside of IT. Our students are now living in a digital age where more of their lives become intertwined with digital technologies. It is important that students understand this technology and are able to use it effectively. In Computer Science, students will develop knowledge and understanding of key computing topics that will prepare them for their future studies in Computing. They will:

Key Stage 3:

1. Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems.
2. 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.
3. 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.
4. 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].
5. Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems.

6. 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.
7. 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.
8. Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design, and usability.
9. 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.

CHS SOUTH - CURRICULUM - FRAMEWORK FOR LEARNING

YEAR GROUP	YEAR 9

RATIONAL / NARRATIVE	

In Year 9 Computing forms part of a rotation with Technology. Students will spend three half terms studying key topics in Computing. They will cover a different topic during each half term that build and develop their skills further from year 8. The key national curriculum strands for Year 9 are listed below with each unit where it is taught highlighted in brackets.

- Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems *(9.1,)*
- Understand how instructions are stored and executed within a computer system *(9.1,)*
- Understand several key algorithms that reflect computational thinking; use logical reasoning to compare the utility of alternative algorithms for the same problem *(9.1,)*
- Design, use, and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems *(9.1,)*
- 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 *(9.2, 9.3)*
- Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design, and usability *(9.3)*
- 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 know-how to, and know how to report concerns *(9.2)*

TERM	HALF TERM 1	HALF TERM 2	HALF TERM 3
KNOWLEDGE	**9.1 - Python Programming** • Writing programs • Python functions – print and input • Variables • Selection (If-elif-else) • Iteration (for statements and for loops) • Identifying syntax errors • Lists	**9.2 - Cybersecurity and Data Science** • Data and information • Data privacy and the Data Protection Act • Security Threats - Social engineering, Hacking, Human error • Methods of prevention and protection • Data Science – visualizing data and identifying patterns. • Global data • Correlation and outliers	**9.3 – Animation** • Making models • Scaling and rotating • Keyframes animation • Stop motion animation. • Complex models and colours • Loop cut and face editing. • Proportional editing • Rendering
SKILLS	• Writing and editing programs in python • Being able to effectively identify syntax errors. • Writing programs that use selection. • Writing Programs using loops • Writing and creating code to meet a specific problem. • Decomposition	• Identifying weak points in data security • Problem Solving • Online Research • Reflection • Breaking down key information • Investigating and analysing data • Identifying and selecting information	• Deleting and adding objects • Moving, rotating, scaling, and colouring object • Using keyframe animation • Using stop motion animation • Naming and parenting to organize animations. • Applying different colours to different parts of the same model • Use proportional editing, knife tools and subdivision.

			• Rendering settings • Set up camera for shot
ASSESSMENT	**Assessment 1:** Programming Assessment **Assessment 2:** End of topic test	**Assessment 1:** Cybersecurity Assessment –(Extended Writing task)	**Assessment 1:** Animation Project **Assessment 2:** Progress Test
HOME LEARNING	**Python Programming** – students examine a range of coding examples and answer a set of questions.	**Cyber Security** – students will examine the different statements and identify if the statements break the computer misuse act.	**Animation** – students will create a storyboard for their animation.
READING, WRITING, TALK, NUMERACY	**Reading:** Students will read a range of different subject specific text including online resources. During this half term they will focus on breaking down information, learning new vocabulary and predict. **Writing:** Students will be expected to record key information by using their expository writing skills. They will also need to summarise information as well as be reflective learning. Students will need to reflect on their skills used throughout this term and then identify areas that they need to improve. They will also write a report linked to the data that they analyse. **Oracy:** Students will focus on developing a range of oracy skills during this half term including their social and emotional skills in the form of listening and responding and confidence in speaking. They will focus on Linguistic skills in the form of vocabulary. **Numeracy:** Students will develop a range of numeracy skills this half term. In the programming topic they will explore the use of operators within the program and how they are used to compare data. In the data science topic students will be required to analyse the data and understand what it represents.	**Reading:** Students will read a range of different subject specific text including online resources. They will focus on asking questions, learning new vocabulary, and inferring. **Writing:** Students will continue to develop their summarising and expository skills. They will also need to develop their reflective and evaluation skills. Students will be reflective during their physical computing and keep a log of their project during the physical computing topic. **Oracy:** Students will focus on developing a range of oracy skills during this half term including cognitive skills in the form of clarifying and summarising as well as self-regulation. They will also focus on social and emotional skills in the form of working with others. **Numeracy:** Students will develop a range of numeracy skills this half term. During the cybersecurity topic students will examine a range of statistics that they will need to be able to interpret. During the physical computing topic students will use operators and timing in their program to make it work appropriately.	**Reading:** Students will use a read a range of text documents linked to this topic. They will focus this term on further developing their skills in asking questions and well as developing previous skills. **Writing:** Students will continue to develop and improve their summarising skills. They will also develop evaluating skills by reflecting on the work that they completed. They will ask to be reflective on their progress during lessons. **Oracy:** Students will develop their Linguistic skills further with a focus on using appropriate vocabulary linked to animation. They will also develop their social and emotional skills with a focus on confidence in speaking. **Numeracy:** Students will use a range of numeracy skills to develop their stop motion animation. Particularly focusing on time and frame rate.
TIER 2 VOCABULARY	• Analyse • Apply • Choose • Complete • Create • Define • Design • Develop • Examine • Select	• Analyse • Calculate • Complete • Create • Data • Describe • Develop • Evaluate • Explain • Justify	• Apply • Choose • Complete • Create • Define • Design • Draw • Export • Illustrate • Process

	• Summarise	• Summarise	• Review
TIER 3 VOCABULARY	• Programming • Variable • Selection • Data types • Arithmetic operator • Selection • Loop • For Loop • While Loop	• Data Science • Data Sets • Correlation • Outliers • Social Engineering • Hacking • Malware • Firewall • Anti-Malware	• Animation • Keyframe animation • Stop motion animation. • Primitive objects • Proportional editing • Rendering • Sudivision
PSPSMC, BRITISH VALUES AND DIVERSITY	**Personal:** Develop Programming skills and. Enable students to build self confidence in their abilities. **Social:** Consider the impact of data being stored long term and how it may be used. **British value:** Understand the laws used to govern information that is stored. **Moral:** Understand how information can be used by companies and how it is sometimes misused. **Physical:** Physical and emotional wellbeing surrounding computers and the time spent on computers. **Cultural:** Understand how different communities and cultures are represented in the data of different companies and how this data is used. **Diversity:** Explore how women and ethnic minorities have shaped programming. Explore the impact of Black women in the space program.	**Personal:** Develop transferable data analysis skills. Develop an understanding of the threats and dangers online. **Social:** Consider the impact that cybercrime can have on people. **British value:** Understand the laws used to govern crime committed using the internet. **Moral:** Understand how people can be affected when they become victims of cybercrime. **Physical:** Physical and emotional wellbeing surrounding how the developments in technologies impact on people and society. **Cultural:** Understand how different communities and cultures are affected by cybercrime. **Diversity:** Explore how different ethnic groups are impacted by cybercrime. Is one group affected more and why is this so? Explore how there is a need for more diversity in the cybersecurity industry.	**Personal:** Develop and build confidence in animation and using those skills **Social:** Consider how to make animation that will appeal to a particular target audience. **British value:** Explore copyright law and the impact that has on create and sharing digital media. **Moral:** Understand how to present information to people that is suitable for the target audience. **Physical:** Physical and emotional wellbeing surrounding how the developments in technologies impact on people and society. **Cultural:** Understand how to create an animation that will appeal to different communities and include relevant information for all **Diversity:** Students' animations projects will focus on exploring different cultures' impact on the computer science industry.