Subject Curriculum Overview for Academic Year 2023/2024

Subject: Computing	Subject Leader: L Kenvyn	Year Group: 8	AUTUMN TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Representations from clay to silicon	End Point: To have a strong understanding of how computers calculate from a binary level upwards. • Provide examples of how symbols are carried on physical media • Explain what binary digits (bits) are, in terms of familiar symbols such as digits or letters • Measure the size or length of a sequence of bits as the number of binary digits that it contains • Describe how natural numbers are represented as sequences of binary digits • Convert a decimal number to binary and vice versa • Convert between different units and multiples of representation size • Provide examples of the different ways that binary digits are physically represented in digital devices • Explain who Allen Turing is, and what happened at Bletchley park	Representations Communication Processing Characters Coding (encoding/decoding) Coding scheme Physical medium Binary digits Digital systems Decimal numbers Binary numbers	Students will be assessed formatively through the completion of recall homework tasks along with a formal end of term assessment completed under exam conditions. The assessment will largely be multiple choice and short answer questions. The assessment will monitor understanding of essential knowledge from modules learnt so far this year.
Computing systems	End Point: To have a strong understanding how the differences between software and hardware, and how computers process logical problems. • Explain the difference between a general-purpose computing system and a purpose-built device • Describe how the hardware components used in computing systems work together in order to execute programs • Define what an operating system is, and recall its role in controlling program execution • Describe the NOT, AND, and OR logical operators, and how they are used to form logical expressions • Use logic gates to construct logic circuits, and associate these with logical operators and expressions • Describe how hardware is built out of increasingly complex logic circuits • Identify examples of artificial intelligence and machine learning in the real world • Describe how machine learning differs from traditional programming • Associate the use of artificial intelligence with moral dilemmas	Computer System Device Program Software Data Hardware Processor Memory Storage Logical operators (NOT, AND, OR) Logical expressions Truth values (true, false), Truth tables Logic gates Artificial intelligence, Machine learning	

Subject Curriculum Overview for Academic Year 2023/2024

Subject: Computing	Subject Leader: L Kenvyn	Year Group: 8	SPRING TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Developing for the web	End Point: To have a strong understanding of Website technologies, including being able to create webpages using HTML & CSS. • Use HTML to structure static web pages • Display images within a web page • Apply HTML tags to construct a web page structure from a provided design • Use CSS to style static web pages • Assess the benefits of using CSS to style pages instead of in-line formatting • Describe what a search engine is • Explain how search engines 'crawl' through the World Wide Web and how they select and rank results • Use search technologies effectively • Discuss the impact of search technologies and the issues that arise by the way they function and the way they are used • Create hyperlinks to allow users to navigate between multiple web pages	HTML Tags Formatting Image Attribute CSS style Search term Hyperlink Crawler Index Query Hyperlink Website	Students will be assessed formatively through the completion of recall homework tasks along with a formal end of term assessment completed under exam conditions. The assessment will largely be multiple choice and short answer questions. The assessment will monitor understanding of essential knowledge from modules learnt so far this year.
Introduction to Python programming	End Point: To develop simple programs in Python using the programming techniques of Selection, Iteration, Abstraction and Decomposition. • Describe what algorithms and programs are and how they differ • Write simple Python programs that display messages, assign values to variables, and receive keyboard input • Locate and correct common syntax errors • Use simple arithmetic expressions in assignment statements to calculate values • Receive input from the keyboard and convert it to a numerical value • Use relational operators to form logical expressions • Use binary selection (if, else statements) to control the flow of program execution • Generate and use random integers • Use multi-branch selection (if, elif, else statements) to control the flow of program execution • Describe how iteration (while statements) controls the flow of program execution • Use iteration (while loops) to control the flow of program execution • Use variables as counters in iterative programs	Algorithm Programming language IDE Variables Integer and string type Execution Selection Relational (or comparison) operators Logical (or Boolean) expressions Conditions Iteration IF Statements FOR Loop WHILE Loop	

Subject Curriculum Overview for Academic Year 2023/2024

Subject: Computing	Subject Leader: L Kenvyn	Year Group: 8	SUMMER TERM
Topic	**Key Learning Points**	**Key Vocabulary**	**Assessments**
Cybersecurity	End Point: Gain a strong understanding of how cybercrime can take place, and what measures can be taken to protect oneself from cybercrime. • Explain the difference between data and information • Identify what happens to data entered online • Explain the need for the Data Protection Act • Recognise how human errors pose security risks to data • Define hacking in the context of cyber security • Explain how a DDoS attack can impact users of online services • Identify strategies to reduce the chance of a brute force attack being successful • Explain the need for the Computer Misuse Act • List the common malware threats • Examine how different types of malware causes problems for computer systems • Compare security threats against probability and the potential impact to organisations • Explain how networks can be protected from common security threats	Cybersecurity Cybercriminals Profiling Privacy policies Data protection Malware Social engineering, Phishing Scam Hacking Penetration testing Brute force attacks Script kiddies DoS (denial of service) DDoS (distributed denial of service) Computer Misuse Act (1990)	Students will be assessed formatively through the completion of recall homework tasks along with a formal end of term assessment completed under exam conditions. The assessment will largely be multiple choice and short answer questions. The assessment will monitor understanding of essential knowledge from modules learnt so far this year.
Media vector graphics	End Point: To have developed sound skills for the production of vector graphics, while also understanding the differences between vector and bitmap images. • Draw basic shapes (rectangle, ellipse, polygon, star) with different properties (fill and stroke, shape-specific attributes) • Manipulate individual objects (select, move, resize, rotate, duplicate, flip, z-order) • Manipulate groups of objects (select, group/ungroup, align, distribute) • Combine paths by applying operations (union, difference, intersection) • Convert objects to paths • Draw paths • Edit path nodes • Combine multiple tools and techniques to create a vector graphic design	Vector Raster Bitmap Paths Pixels Rectangle Ellipse Segment Polygon Stroke Flip z-order intersection, equidistant	

Subject Curriculum Overview for Academic Year 2023/2024

How parents can support learning in the subject this academic year

Encourage students to use computers at home in creative ways, from: attempting to create digital art, research interests and hobbies online, learn how to make mods for the games they like to play.
Promote the use of online revision tools such as BBC Bitesize, Seneca and GCSEPod.

Recommended Reading

- For further reading around topics covered in lessons – https://www.bbc.co.uk/bitesize/subjects/zvc9q6f
- To further Programming skills – https://www.w3schools.com/python/
- To build digital art skills – https://www.photopea.com/
- To learn more about computers in general - https://www.youtube.com/c/Techquickie/videos?view=0&sort=p&shelf_id=0

Points to note

Year 8 is the next step of the students journey into learning computer science. It is assumed that students will have undertaken all units in year 7 but for those with no prior knowledge will still be able to access the content of this year. All students with be able to secure key skills and knowledge in order to succeed further.
There is no textbook or revision guide used this year.