| Computing Year 7 | **Curriculum intent:** The year 7 curriculum will consolidate and build on the key themes studied at KS2. Students will study aspects of Computational Thinking, Problem Solving, Analysis, Evaluation and Implementation as well as developing their Technical Vocabulary. Opportunities to revisit key concepts through retrieval practice have been built into the curriculum as well as spaced learning and consolidation exercises in order to maximise retention of key knowledge. Knowledge and skills are acquired through the use of carefully planned practical activities with an emphasis on an investigative approach and teamwork. Key skills will be developed with repeated practice. Students will develop understanding of key concepts and will be given the opportunity to demonstrate this in a range of different contexts. | | | | | |
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| **Topic** | **Welcome to Computing** | **Introduction to Programming** | **Digital Systems** | **Programming with Text** | **Networks and Communication** | **Data Handling** |
| **Interleaving** | Key knowledge from previously studied topics (primary) | Key knowledge from previously studied topics | Key knowledge from previously studied topics | Key knowledge from previously studied topics | Key knowledge from previously studied topics | Key knowledge from previously studied topics |
| **Knowledge** | Students will study a range of ways to use technology whilst ensuring they do so safely, respectfully, responsibly and securely.<br><br>Digital Identity, protection of online identity and assets and privacy are covered as is how to recognise inappropriate content, contact and conduct and how to react (including reporting concerns).<br><br>How to use basic office applications and produce original content is also covered. | Students will learn how to undertake a creative project involves design, planning, implementation and testing.<br><br>Students will first examine and recognise their audience and then create an appropriate solution in code before testing and fixing any issues.<br><br>The solution is then evaluated against their initial success criteria and opportunities for improvement are visited to improve the end product for the target audience. | Students will study the hardware and software components that make up computer systems and how they communicate with one another and with other systems.<br><br>Students will learn how to represent numbers and text using Binary and hexadecimal, the need to do this and how this is achieved and used in the real world.<br><br>Students will know about storage and data sizing and how the impacts and importance of these have changed over time. | Students will learn how to use a text based programming language to create solutions to a variety of problems.<br><br>As part of this students will learn how to make appropriate use of types, data structures, iteration and develop modular programs that use procedures and functions to create effective code. | Students will study how computer systems communicate and how this data is transferred in a secure fashion.<br><br>Students will cover the key concepts of data encryption and why this is required before creating and implementing encryption systems both on and offline. | Students will learn how to design, use and evaluate data using computer based systems, how to design collection mechanisms, collect data and produce meaningful and easy to read output.<br><br>Privacy, purpose and intent of data collection is covered alongside weighing this against privacy and legality. |
| **Understanding** | Students will be able to log in to use various systems, manage their files and content including techniques to make use of online software systems and file storage.<br><br>Understand some of the dangers and drawbacks of online communication and participation and appropriate responses to cyberbullying.<br><br>Describe guidelines for keeping identity secure on the Internet. Describe what is meant by identity theft and how to minimise the risks of this. Identify a probable phishing email and deal with it appropriately. Describe why the information online still needs to be assessed for reliability. | Students will be able to explain that a computer program requires a precise series of instructions to operate and recognise the importance of sequence, repetition, naming and precision.<br><br>Students will also be able to explain the code they are implementing and recognise the way this translates into a running interactive program when run.<br><br>Gain the knowledge and understanding to independently create or modify a game, adding extra depth and complexity by using a range of more advanced game techniques as they deem appropriate to meet the needs of the target audience. | Students will be able to draw a block diagram showing CPU, input, output and storage devices. Name different types of permanent storage device.<br><br>Explain what RAM and ROM are used for. Show how numbers and text can be represented in binary and how hexadecimal relates to binary and why it is used. Perform simple binary arithmetic.<br><br>State strengths and weaknesses of different storage devices and understand how data sizing is relevant to complexity and other involved systems. | Students will be able to correctly use different variable types (e.g. integer and floating point), assignment statements, and arithmetic operators. Distinguish between syntax and logic errors and be able to find and correct both types of error.<br><br>Write an error-free, well-documented program with useful documentation that explains the flow of program execution.<br><br>Testing and debug of programs, and correction of both syntax and logic errors.<br><br>How to accept user input and respond appropriately. | Students will be able to describe how computers communicate and how data is kept private/secure.<br><br>Students will be able to identify the basic components required to connect to a computer network and give examples of different real-world networks and how they are used.<br><br>Students will be able to design an encryption mechanism and evaluate its effectiveness in terms of fitness for a range of different purposes. | Students will be able to design and create a survey to be completed electronically and then interpret the collected data.<br><br>Students will understand how to format a simple spreadsheet model, create formulae in this spreadsheet and make use of available functions.<br><br>Students will also be able to create meaningful visual output and select the most appropriate form of output for the data they are displaying.<br><br>Students will evaluate the data they collected in terms of intent and discuss alternative information that could have been collected that may be more pertinent. |
| **Skills** | Computational Thinking / Problem Solving / Analysis, Evaluation and Implementation / Technical Vocabulary | Computational Thinking / Problem Solving / Analysis, Evaluation and Implementation / Technical Vocabulary | Computational Thinking / Problem Solving / Analysis, Evaluation and Implementation / Technical Vocabulary | Computational Thinking / Problem Solving / Analysis, Evaluation and Implementation / Technical Vocabulary | Computational Thinking / Problem Solving / Analysis, Evaluation and Implementation / Technical Vocabulary | Computational Thinking / Problem Solving / Analysis, Evaluation and Implementation / Technical Vocabulary |
| **Assessment** | Pupils will sit a multiple choice test as their final assessment. | Students will maintain a journal-style workbook of their project which will be assessed throughout the project. | Pupils will sit a test as their final assessment for this topic | Pupils will write, run and test programs and submit their work as they progress. Tests on terminology and recognition throughout. | Pupils will complete multiple tasks and assessment with an end of unit summary test covering networking and encryption. | Pupils will present the survey they have designed, the results and interpretation alongside their evaluation. They will also answer questions on spreadsheet modelling and complete a self-assessment. |