

Co-op Belle Vue Computer Science Five year Overview

The Key Stage 3 curriculum at BelleVue emphasises the development of both procedural and declarative knowledge in the realms of digital literacy, ICT, and computer science. Students not only learn practical skills and procedures, known as procedural knowledge, such as how to use software applications, write code, and secure networks, but they also acquire conceptual understanding and theoretical knowledge, known as declarative knowledge, about the underlying principles and concepts in technology.

As students engage with various topics, such as hardware components, data representation, programming, and cyber security, they not only learn the step-by-step procedures for performing tasks but also gain a deeper understanding of the principles and theories behind those tasks. For example, while learning programming essentials and Python programming with sequences of data, students not only learn how to write code and solve problems procedurally but also develop a conceptual understanding of algorithms, data structures, and programming paradigms, enriching their declarative knowledge.

Similarly, as students explore topics like network fundamentals, cyber security threats, and data science techniques, they not only learn practical procedures for securing networks and analysing data but also gain a conceptual understanding of network protocols, encryption methods, and statistical algorithms, deepening their declarative knowledge in these areas.

By integrating both procedural and declarative knowledge throughout the curriculum, we ensure that students not only acquire practical skills for using technology but also develop a strong foundation of conceptual understanding, empowering them to apply their knowledge in real-world scenarios, think critically about technology issues, and adapt to new technologies and challenges in the future.

Core Concepts

- Digital literacy: the 'skills and knowledge required to be an effective, safe and discerning user of a range of computer systems'.^[footnote 88] It covers a range of knowledge and skills, such as using physical devices or knowledge of the features that are likely to mean digital content is reliable.
- Information communication technology provides a context for the use of computers in society. It focuses on how computers are used in different sectors. 2 content areas of information technology: digital artefacts and computing contexts. Digital artefacts are digital objects created by humans. Knowledge of computing contexts chronicles the history of the discipline and explains how computing is used in the modern world.
- Computer science covers knowledge of computers and computation, including concepts such as data, system architecture, algorithms and programming.

Year 7 Long Term Plan

In Year 7, students are introduced to a foundational curriculum focusing on various aspects of technology, computing, and digital literacy. Firstly, they explore the basics of networking through an introduction to the school network, learning about its structure, components, and functions. They delve into

network security and e-safety, understanding the importance of safeguarding information and practising safe online behaviour, particularly within platforms like Google Classroom, Google Drive, and email. Students learn to navigate these digital tools effectively, understanding their features and applying prior e-safety knowledge to ensure responsible digital citizenship. They also explore design principles, considering the suitability of different media types (text, image, sound, video) and learning to create engaging digital artefacts, including interactive quizzes and multimedia presentations using tools like Google Slides. Additionally, students gain a foundational understanding of hardware and software, exploring concepts such as input, processing, and output, as well as the internal components of a computer, including the CPU and logic circuits. They learn to represent information using binary digits and develop programming skills, including sequencing, variables, selection, iteration, and debugging, using a variety of programming languages or environments. Overall, the Year 7 curriculum provides students with essential knowledge and skills in technology, digital literacy, and computing, setting a strong foundation for further exploration and development in these areas.

Care Cycle 1	Care Cycle 2	Care Cycle 3	Care Cycle 4	Care Cycle 5
Topic: Computer Science @ BelleVue Creating effective safe and discerning users of Computer Science	Topic: Creating a Digital Artefact for a given audience Interactive Multimedia ESafety Quiz	Topic: Hardware Components that make up a Computer System	Topic Introduction to Data Representation	Topic :Programming Essentials
Key concepts	Key concepts	Key concepts	Key concepts	Key concepts
Digital literacy	ICT Digital literacy	Computer Science	Computer Science	Computer Science
Includes: Introduction to School Network Network Security Google Classroom Google Drive Email E-Safety	Includes: Design Principles Suitability of text, image, sound, video Application of prior esafety knowledge Key features of good interactive quiz Tools to copy image between apps Digital artefact created in GS Combine text and graphics	Includes: Input Process Output Hardware and Software Identifying device function Inside the computer CPU - Fetch Decode Execute Logic Circuits NOT AND OR	Includes: Representing Numbers and Text using Binary Digits	Includes: Sequencing Predications Variables Tracing values of variables Selection Comparison operators Logic Operators Iteration Debugging Count controlled iteration

Assessment: Part 1 KE Part 2 Staying safe online	Assessment: Part 1 KE Practical Application	Assessment: Achievement Assessment	Assessment: Part 1 KE Part 2 Practical - Conversions	Assessment: Computational Thinking
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Year 8 Long Term Plan

In Year 8, students are immersed in a multifaceted curriculum focusing on operating systems, utilities, applications, and essential computing skills. They explore the fundamentals of operating systems, utilities, and applications, gaining an understanding of their functionalities and roles in computing environments. Additionally, students delve into spreadsheet concepts such as columns, rows, cells, and cell referencing, along with formatting techniques and formula/functions for data analysis. They learn to distinguish between data and information, analyse data from primary and secondary sources, and apply conditional formatting for effective data visualisation. Moreover, students develop proficiency in selecting appropriate software for specific tasks, understanding the key features of word processors, formatting documents, selecting images, and applying appropriate licences for online content. They also explore digital imaging concepts, including pixels, resolution, and colour depth, and acquire skills in basic image editing and manipulation. Furthermore, students explore programming concepts such as algorithms, program translation, and basic Python programming, learning to write, debug, and execute simple programs, perform calculations, handle user input, make decisions, and utilise loops for repetition and iteration. Through hands-on activities and projects, Year 8 students build a solid foundation in computing, preparing them for more advanced studies in computer science and technology.

Care Cycle 1	Care Cycle 2	Care Cycle 3	Care Cycle 4	Care Cycle 5
Topic: Software	Topic: Modelling data using spreadsheets	Topic: Reliability of Source	Topic: Media Representation	Topic : Programming
Key concepts	Key concepts	Key concepts	Key concepts	Key concepts
ICT Computer Science	Digital Literacy ICT	Digital Literacy ICT	Digital Literacy Computer Science	Computer Science
Includes: Operating System Utilities Applications	Includes: Columns Rows Cells Cell referencing Formatting Formula / Functions	Includes: Select the most appropriate software to use to complete a task Identify the key features of a word processor Apply the key features of a	Includes: digital images are composed of individual elements the colour of each picture element is represented using a sequence of binary	Includes: Understanding what programs and algorithms are. Fixing mistakes in programs. Knowing that programs need translation to run.

	Data and Information Primary and Secondary Sources Analysis of data Conditional Formatting	word processor to format a document Evaluate formatting techniques to understand why we format documents Select appropriate images for a given context Apply appropriate formatting techniques Demonstrate an understanding of licensing issues involving online content by applying appropriate Creative Commons licences Blogging	digits 'pixels', 'resolution', and 'colour depth' an image can be represented as a sequence of bits basic image editing tasks using appropriate software and combine them in order to solve more complex problems requiring image manipulation assess the creative benefits and ethical drawbacks of digital manipulation (Education for a Connected World) sounds are represented as sequences of bits	Writing basic Python programs. Learning how to assign values and do calculations. Getting keyboard input and converting it to numbers. Using random numbers and making choices in programs. Understanding loops (repeating tasks) in programs. Making decisions with multiple options in programs. Using loops and counting with variables in programs.
Assessment: Part 1 KE part 2 Select the most appropriate software to use to complete a task	Assessment: Part 1 KE Part 2 Practical Application	Assessment: Achievement Assessment	Assessment: Part 1 KE Part 2 Application of Editing skills	Assessment: Achievement Assessment

Year 9 Long Term Plan

In Year 9, students engage in a comprehensive curriculum that introduces them to key concepts in computer science, programming, and information technology. They learn to manipulate strings and lists using programming languages like Python or JavaScript, gaining skills in accessing, modifying, and processing data. Through a programming project, students apply their knowledge to develop software applications, honing their problem-solving and coding abilities. Additionally, they explore physical computing with devices such as the BBC micro:bit, learning to interface sensors and actuators to sense and control the environment programmatically. Students also delve into networking hardware, understanding how components like routers and switches facilitate communication within computer networks. Furthermore, they develop an awareness of cybersecurity measures, identifying threats and learning strategies to protect individuals and organisations from cyber attacks. Finally, students use data analysis techniques to investigate real-world problems and propose solutions, developing essential skills for data-driven decision-making. Through hands-on activities and projects, the Year 9 curriculum equips students with foundational knowledge and practical skills for future studies and careers in technology.

Care Cycle 1	Care Cycle 2	Care Cycle 3	Care Cycle 4	Care Cycle 5
Topic: Python Programming with sequences of data	Topic: Developing physical computing projects	Topic: Networks	Topic: Cyber Security	Topic: Data Science
Key concepts	Key concepts	Key concepts	Key concepts	Key concepts
Computer Science	Computer Science Digital Literacy	Computer Science ICT	Digital Literacy Computer Science	Digital Literacy ICT
Includes: Manipulating strings and lists. Searching and Sorting algorithms Creating a programming project	Includes: Sensing and controlling with the micro:bit	Includes: Recognising networking hardware and explaining how networking components are used for communication	Includes: Identifying how users and organisations can protect themselves from cyber attacks	Includes: Using data to investigate problems and make real world changes
Assessment :Part 1 KE Part 2 Additional	Assessment:Part 1 KE Part 2 Micro:bit	Assessment: Achievement Assessment	Assessment:Protecting myself from Cyber	Assessment:Achievement Assessment and Practical

programming techniques	Practical		Attacks	
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