SUBJECT & QUALIFICATION:

Computer Science (9-1) - J277

Computing Context

Computing is made up of Computer Science, Information Technology, and Digital Literacy, these are defined as follows:

- Computer Science involves understanding the workings of a computer, data structures and representation, systems architecture, algorithms and programming.
- Information Technology focuses on different types of technology and various software applications to solve problems by producing digital artefacts.
- Digital Literacy emphasises practical skills for using modern and emerging technologies and has a strong focus on e-safety.

Computing Vision

We believe that Computing should instil a sense of wonder in our students toward the ever-evolving world of technology to prepare them for future employment. As one of the fastest-growing and continually developing sectors, computing takes a lead role in our everyday lives. Our goal is to demonstrate how modern computing empowers students to excel and broaden perspectives, promoting social mobility.

Our goals for students are to:

- Grasp and apply the fundamental principles of computer science, including abstraction, logic, algorithms, and data representation.
- Analyse problems using computational thinking, gaining practical experience in writing programs to solve these issues in a range of languages (block / text).
- Understand the key roles of hardware and networking.
- Develop skills to confidently use IT applications, creating digital artefacts such as spreadsheets and presentations for a given audience.
- Become safe, respectful and responsible users of a range of technologies including Artificial Intelligence(AI).

Our Computing curriculum is designed to equip students with the skills and experiences necessary to pursue future studies and careers across a broad range of subjects including STEM. This provides opportunities to discover new hobbies and interests within the subject.

This comprehensive study is enhanced through a robust offering that broadens the horizons ensuring all students have a passion for Computing and have every opportunity to excel. By interweaving e-Safety throughout our curriculum, we guide students to navigate the digital world safely and responsibly.

Does the Key Stage 3 coverage reflect the content in the national curriculum?
Our Key Stage 3 curriculum reflects the national curriculum expectations. This can be cross referenced with our vision of the curriculum shown above. Every school in our trust not only meets the expectations of the national curriculum but actually exceeds it with the inclusion of 4 programming languages; Microbit, Small Basic, Python and Sonic Pi.

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The Learning Journey

The Computing curriculum is structured through a series of learning journeys, designed to develop students' knowledge. Computing allows for deeper thinking and practical application throughout KS3, through a sequenced curriculum that revisits key topics to build on previous learning, interleaving skills and knowledge development**.**

Computing Software

In today's rapidly evolving technological landscape, digital literacy is an indispensable skill set for students. Integrating software into the educational framework is not simply an option, but a necessity to prepare students for future success.

By incorporating diverse software into the curriculum, we empower students to become active participants in their learning journey. This approach allows for critical thinking, problem-solving abilities, and creativity as students engage with technology in meaningful ways. From coding platforms to collaborative online tools, the integration of technology caters to varied learning styles, enhancing inclusivity and engagement.

Hands-on experience with digital tools bridges the gap between theoretical knowledge and real-world applications. Students gain a deeper understanding of how technology impacts various industries, making their learning more relevant and stimulating. As students develop proficiency with digital tools, they gain confidence and the ability to innovate, preparing them for a future where digital skills are highly sought after. By embracing digital technologies, we not only enhance the educational experience but also equip students with essential competencies for the digital age.

Special Educational Needs and Disabilities (SEND)

The National Curriculum Inclusion Statement emphasises the importance of setting high expectations for every pupil, regardless of their prior attainment. In a classroom equipped with computers, teachers should use adaptive teaching methods and appropriate assessments to set deliberately ambitious targets. Identifying potential areas of difficulty early on allows teachers to address these challenges from the outset, ensuring lessons are designed to remove barriers to achievement.

Adaptive teaching in a computer-based classroom involves using technology to tailor instruction to meet the unique needs of all learners, including those with lower ability levels. Differentiated instruction can be facilitated through various software and online resources that offer personalised learning experiences. For low-ability learners, this might include interactive tutorials, step-by-step guides, or educational games that reinforce key concepts.

Teachers can leverage educational software that adapts to each student's learning pace, providing instant feedback and additional practice where needed. Group work can be organised through collaborative tools, allowing students to learn from each other while the teacher provides targeted support. Visual aids, video tutorials, and interactive simulations can help make complex topics more accessible.

In addition, teachers should use continuous assessment tools available on computers to monitor student progress in real-time. This data can inform instructional adjustments, ensuring that every student receives the support they need to succeed. Teachers can set up individualised learning paths and provide additional resources or activities to challenge higher-ability students and support those who need more practice.

Creating an inclusive and engaging computer-based classroom environment involves using a variety of digital teaching strategies. By embracing adaptive teaching and differentiation, teachers can ensure that all students, regardless of their starting point, have the opportunity to reach their full potential. This approach not only supports academic achievement but also fosters confidence and a love for learning in every pupil.

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Why is the Study of OCR GCSE Computer Science (9-1) - J277 important?

Computer Science is the study of the principles and use of computers. This discipline helps you understand the systems used in modern society, encouraging exploration of the underlying technology and developing skills to create new technologies.

In GCSE Computer Science, you'll learn the four cornerstones of Computational Think ing, crucial for any computer science context. These cornerstones provide a solid foundation for other topics and key programming constructs, enabling you to develop programming skills in multiple environments. This aids in understanding similarities betwe en different programming environments and honing problem - solving and debugging skills. These skills are further mastered in text - based programming languages, applying Computational Thinking in various scenarios.

You'll also delve into Computer Science theory, examining the hardware and networks of everyday computer systems. Key topics include network formation, security risks, and mitigation strategies, with a focus on the significance of computer security t o national security. This knowledge helps you become a responsible e - citizen, understanding the technological world and enhancing problem - solving resilience.

Throughout your study, you'll explore fundamental Computer Science principles, including abstraction, decomposition, logic, algorithms, and data representation. You'll analyse problems computationally, design, write, and debug programs, and think creatively, analytically, and critically. The curriculum includes practical applications through programming languages and discussions on the ethical, moral, and social implications of technology.

Computer Science poses significant challenges, fostering technological progress and innovation. It encourages creative application of concepts and skills, identifying areas for further technological development. Y ou'll explore big questions like the impact of artificial intelligence on jobs, the digital divide, and internet - related opportunities and issues, deepening your understanding of computer science through theory and practical application

Why is the Study of WJEC Level 1/2 Vocational Award ICT (Technical Award) important?

WJEC Level 1/2 Vocational Awards (Technical Awards) provide learners with opportunities to study vocational subjects alongside GCSEs and other general and vocational qualifications as part of a broad program of study. Students will learn a wide range of key ICT skills. Vocational ICT is a skills and knowledge-based course which aims to give students the ICT foundation they will need in future life. During this course, students can expect to develop practical skills in office software and develop their understanding of information communication technology.

Why is the study of Pearson BTEC Level 1/Level 2 - Tech Award in Digital Information Technology important?

The study of Pearson BTEC Level 1/Level 2 - Tech Award in Digital Information Technology is important for several key reasons, especially in today's increasingly digital world. Here's a breakdown:

1. Foundational Digital Literacy:

The world runs on digital technology. This qualification provides students with essential digital literacy skills, ensuring they understand how technology works, how to use it effectively, and how to navigate the digital landscape safely and responsibly.

2. Preparation for Further Education and Careers:

It acts as an excellent stepping stone for students who wish to pursue further education in IT, computing, or related fields at college or university. It also equips them with practical skills that are highly valued in a wide range of careers, not just those specifically in IT. Many jobs now require a good understanding of digital tools and processes.

3. Development of Practical, Hands-on Skills:

OPEN ELEMENT SUBJECT OVERVIEW

Unlike purely theoretical courses, the BTEC Tech Award emphasizes practical application. Students learn by doing, which means they develop tangible skills in areas like:

- Data management: Understanding how data is collected, stored, processed, and presented.
- Project planning: Learning to plan and manage digital projects from conception to completion.
- Digital communications: Using various digital tools for effective communication and collaboration.
- Cyber security awareness: Understanding threats and how to protect themselves and data online.
- Problem-solving: Using digital tools to solve real-world problems.

4. Understanding the Digital World's Impact:

The course helps students understand the wider impact of digital technology on society, businesses, and individuals. This includes ethical considerations, data privacy, and the influence of digital innovation.

5. Building Transferable Skills:

- Beyond specific IT knowledge, students develop valuable transferable skills such as:
- Critical thinking: Evaluating digital information and tools.
- Research skills: Finding and using digital resources effectively.
- Communication: Presenting digital information clearly.
- Teamwork: Collaborating on digital projects.

6. Relevance to Modern Industry:

The content is designed to be relevant to current industry practices and future trends. This ensures that the skills students gain are up-to-date and in demand by employers.

7. Promoting Creativity and Innovation:

Students are often encouraged to use digital tools creatively to solve problems or present information, fostering an innovative mindset.

In essence, the Pearson BTEC Tech Award in Digital Information Technology provides a robust foundation for navigating, understanding, and contributing to the digital world,

What skills will I learn

The Pearson BTEC Level 1/Level 2 Tech Award in Digital Information Technology will teach you a range of practical and theoretical skills crucial for understanding and working with digital technology. The curriculum typically covers three main components:

Component 1: Exploring User Interface Design Principles and Project Planning This component focuses on how digital systems are designed and planned. You will learn about:

- **User Interface (UI) Design Principles:**
  - What makes a good user interface (e.g., ease of use, accessibility, aesthetics).
  - Understanding different UI elements (buttons, menus, text fields) and their functions.
  - Learning about user experience (UX) and how design impacts a user's interaction with a digital product.
  - Techniques for creating effective and engaging user interfaces.

- **Project Planning for Digital Products:**
    - The stages involved in planning a digital project (e.g., defining requirements, identifying stakeholders, setting timelines).
    - Using various project planning tools and methodologies.
    - Understanding how to gather and analyze user requirements.
    - Creating design specifications and prototypes for digital products.

Component 2: Collecting, Presenting and Interpreting Data This component focuses on the essential skills of data handling, which is vital in almost every industry today. You will learn about:

- **Data Collection Methods:**
    - Different ways to collect data (e.g., surveys, observations, existing databases).
    - Understanding the importance of reliable and valid data.
    - Ethical considerations in data collection.
- **Data Storage and Management:**
    - How data is organized and stored in digital systems.
    - Basic concepts of databases and spreadsheets.
    - Ensuring data security and integrity.
- **Data Presentation and Visualisation:**
    - Using various software tools (like spreadsheets and presentation software) to display data effectively.
    - Creating charts, graphs, and reports to communicate insights from data.
    - Understanding the principles of good data visualisation to avoid misleading interpretations.
- **Data Interpretation and Analysis:**
    - How to draw meaningful conclusions from data.
    - Identifying trends, patterns, and anomalies in data sets.
    - Using data to inform decision-making.

Component 3: Effective Digital Working Practices This component covers the broader context of working with digital technology, including its impact and responsible use. You will learn about:

- **Cyber Security:**
    - Understanding common cyber threats (e.g., viruses, phishing, hacking).
    - Methods to protect data and systems (e.g., strong passwords, anti-virus software, firewalls).
    - Safe online practices for individuals and organizations.
- **Digital Communication and Collaboration:**
    - Using various digital tools for effective communication (e.g., email, instant messaging, video conferencing).
    - Collaborating on digital projects using shared documents and online platforms.
    - Understanding netiquette and professional digital communication.
- **Impact of Digital Technology:**
    - How digital technology affects businesses, society, and individuals (e.g., automation, e-commerce, social media).
    - Ethical considerations surrounding digital technology (e.g., privacy, data ownership, digital divide).
    - Understanding copyright, intellectual property, and licensing in a digital context.
- **Digital Responsibility and Law:**
    - Relevant laws and regulations concerning digital information (e.g., data protection acts).

- Understanding the importance of responsible and legal use of digital technology.

By completing this course, you'll gain a well-rounded understanding of how digital technology functions, how to use it effectively, and its broader implications, preparing you for a future in a digitally-driven world.

How are you assessed in Computer Science?

At KS3 we assess our students formally at the end of each distinct unit. This is in the form of either teacher-led assessment or formal test assessment. This assessment forms the basis for any appropriate support and intervention required.

How are you assessed in Computer Science?

There are half term assessment points each year that we term Praising Stars©. At GCSE we make informed predictions informed by our holistic assessment of their progress against the key assessment objectives and their aspirational targets. These are also the basis for any appropriate support and intervention. The GCSE course terminates with two 90 minute assessments; one for Unit 1 and one for Unit 2, both written and non - calculator papers

OPEN ELEMENT SUBJECT OVERVIEW

CURRICULUM PROGRESSION PATHWAY FOR COMPUTER SCIENCE					
	YEAR 7	**YEAR 8**	**YEAR 9**	**YEAR 10 - Computer Science**	**YEAR 11 - Computer Science**
Autumn 1	The Outwood Welcome - Introduction to Our Systems and an introduction to e-safety	Data Representation - Introduction to Binary, Hexadecimal, Image Representation and Sound Representation	Python Programming - Further developing Python programming skills and knowledge.	Programming with Python Unit 2.1 - Programming Theory	Unit 1.3 - Networks Unit 1.4 - System Security
Autumn 2	Charlie and The Chocolate Factory - ICT Project - Google Docs, Slides and Adobe Photoshop	Python Programming - An introduction to Python.	Databases and Design	Programming with Python Unit 1.2 - Representation of Data Unit 2.2 - Data Types & Operators	Unit 1.5 - Systems Software Unit 1.6 - Legal, Ethical, Moral & Cultural issues Revision for Exams
Spring 1	Computational Thinking - Abstraction, Pattern Recognition, Decomposition & Algorithms	People in Technology - Developing Digital Literacy skills to develop a project relating to the People in Technology.	Digital Forensics - A look at key e-safety topics that affect us and businesses.	Programming with Python Unit 2.3 - 2.5 - Creating Robust Programs, Logic and Types of Language & Translators	Unit 2.1 - Programming Theory Unit 2.3 Creating Robust Programs
Spring 2	Micro:bit - text based programming	Python Programming - A further development of Python programming skills and knowledge.	Computer Theory - Hardware, Storage and Networks.	Programming with Python Unit 2.1 - Searching and Sorting Algorithms	Revision for Exams
Summer 1	ICT Music Festival - Introduction to Spreadsheets, presenting data and		Data Science - Learn about modern computing and Future technologies.	Programming with Python	Revision for Exams

	incorporating/developing digital images.				
Summer 2	Small Basic - Text-based programming.	Media Project	Sonic Pi	Programming with Python Unit 1.1 - Key Systems Hardware	

Digital IT Course Overview - Current Year 10 and Beyond		
Term	**Year 10**	**Year 11**
Autumn	**1 Spreadsheet Skills Component 3 - Planning and Communication**	**PSA 1 - Exploring User Interface Design Principles and Project Planning Techniques**
Autumn 2	**Component 3 - Theory Modern Technologies**	**PSA 1 - Exploring User Interface Design Principles and Project Planning Techniques**
Spring 1	**PSA 2 - Collecting, Presenting and Interpreting Data**	**Component 3 Exam**
Spring 2	**PSA 2 - Collecting, Presenting and Interpreting Data**	**Improvements to PSA's and revision for resits**
Summer 1	**PSA 2 - Collecting, Presenting and Interpreting Data**	**Improvements to PSA's and revision for resits**
Summer 2	**Component 3 - Cyber Security** **Component 3 - Implications of Digital Systems**	

How can Computer Science support your future?

Computer Science is offered at most sixth-form colleges and prestigious universities either as a single honour or a joint honours subject studied alongside other disciplines e.g. Computer Systems Engineering, Computer Games Design, Computer Science & Artificial Intelligence, Mathematics & Computer Science and Computer Forensics. The very fact that you have been able to study Computer Science e.g. computational thinking will help your future application be it for colleges, universities, apprenticeships or employment.

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Careers that the study of Computer Science supports include:

- Secondary School Teacher
- Database administrator
- Software Developer
- Web Application Developer
- Computer Systems Analyst
- Mobile App Developers
- Information Security Analyst
- Computer Network Architect
- Software Tester
- Network Manager

There are a wide range of ICT & media-based courses offered post-GCSE students at colleges and sixth form providers including our own. Within Outwood we offer an ICT qualification that utilises the skills learnt inLevel 1/2 Vocational Award ICT (Technical Award) and this is deliberate to ensure progression between stages of study. Due to Level 1/2 Vocational Award ICT (Technical Award) being a wide ranging curriculum this allows for many avenues to be explored into higher and further education. There are a vast range of courses offered at university that target digital media, either through the production, design or publicising through this media.