Curriculum Progression Pathway

OPEN ELEMENT SUBJECT OVERVIEW

SUBJECT & QUALIFICATION:

Computer Science (9-1) - J277

WJEC Level 1/2 Vocational Award in ICT (Technical Award)

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? Current Yr 11 only

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 Digital IT important? Current Year 10 and beyond

The digital sector is a major source of employment in the UK. Despite a turbulent economy in 2020 the Digital sector in the UK advertised 90,000 jobs per week during. Digital skills span all industries, and almost all jobs in the UK today require employees to have a good level of digital literacy.

The UK Tech industry as a whole employs over 2.93 million people and has seen 40% growth between 2017-2019. The UK has positioned itself to be the 'Digital capital of Europe' as it continues to invest billions every year in digital skills and commerce. The modern world expects digital skills to be as important as English and maths. Having both technical skills and business understanding is the key to success.

In studying Digital IT, you will learn essential working practices for the IT and Business sectors. This includes understanding client briefs, meeting time frames and deadlines, and preparing products that meet client needs. You'll learn to plan and design products according to user briefs, gaining skills in spreadsheets and prototyping user interfaces.

Digital IT also emphasises the importance of justifying your design decisions. This involves explaining why certain design choices were made and how they meet the needs of the target audience or industry. By understanding the reasons behind your designs, you can create more effective and efficient products.

Overall, Digital IT prepares you for a career in the IT and Business sectors by providing you with practical skills and knowledge. It

helps you understand the digital tools and technologies used in these fields, making you a valuable asset in any modern workplace.

What skills will the study of Digital IT teach you? Current Year 10 and Beyond

As technology evolves, how we communicate and interact with it has changed significantly. Having the skills to demonstrate knowledge and communicate effectively in the digital world is crucial. This course will teach you to;

- Communication
- Coping with rapid changes in technology
- Critical thinking
- Designing, creating, testing and evaluating systems
- Learning independently
- Numeracy and data handling
- Problem solving
- Research
- Taking on responsibility
- Time management

What will you know and understand from your study of Digital IT? Current Year 10 and Beyond

The Digital IT qualification gives learners the opportunity to develop sector-specific applied knowledge and skills through realistic vocational contexts. The main focus is on four areas of equal importance, which cover the:

- development of key skills that prove your aptitude in digital information technology, such as project planning, designing and creating user interfaces and dashboards as a way to present and interpret data.
- process that underpins effective ways of working in digital information technology, such as project planning, the iterative design process, cyber security, virtual teams, legal and ethical codes of conduct.
- attitudes that are considered most important in digital information technology, including personal management and communication.
- knowledge that underpins effective use of skills, process and attitudes in the sector such as how different user interfaces meet user needs, how organisations collect and use data to make decisions, virtual workplaces, cyber security and legal and ethical issues.

This qualification complements the learning in GCSE programmes such as GCSE Computer Science. It is an introduction to the application of project planning techniques to plan, design and develop a user interface, how to collect, present and interpret data and the use of digital systems.

How can you deepen your understanding of Digital IT? Current Year 10 and Beyond

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Digital IT is all around us, and taking an interest in the products and systems that are used everyday by businesses. How do businesses track customers? How do businesses communicate effectively with customers and suppliers? Why is a document structured in a certain way? These questions will further deepen your understanding within the subject. Immersing yourself in IT will certainly help deepen your knowledge and understanding of products and systems.

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

How are you assessed in WJEC Level 1/2 Vocational Award ICT (Technical Award)? Current Year 11 Only

Level 1/2 Vocational Award ICT (Technical Award) is assessed through 2 compulsory units.

- Unit1: ICT in society is a 1 hour 20 minute on screen examination. This is worth 40% of your overall grade.
- Unit 2: ICT in context is a controlled assessment coursework that is worth 60% of your grade.

How are you assessed in Digital IT? Current Year 10 and Beyond

There are 6 assessment points each year that we term Praising Stars©. We assess how students at their current stage of study are on track to reach their end of stage targets which are formulated on aspirational expectation from their KS2 starting points. We make an informed prediction from our holistic assessments based on our subject mapping of expectation across the Digital IT curriculum.

Digital IT is assessed through a range of internal and external assessment. There are three components in total. Component 1 (coursework) contributes 30%, Component 2 (coursework) contributes 30% and finally Component 3 (Exam) contributes 40% towards the overall qualification. The coursework units are known as Pearson Set Assignments (PSA's) and are completed in a set window in year 10 and year 11.

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CURRICULUM PROGRESSION PATHWAY FOR COMPUTER SCIENCE							
	YEAR 7	**YEAR 8**	**YEAR 9**	**YEAR 10 - Vocational ICT**	**YEAR 11 - Vocational ICT**	**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.	Spreadsheets - Introduction, Functions and Formulas	Independent Coursework	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	Spreadsheets - Assessment Based on scenario	Independent Coursework	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.	Automated Document	Independent Coursework & Exam preparation	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

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Spring 2	Micro:bit - text based programming	Python Programming - A further development of Python programming skills and knowledge.	Computer Theory - Hardware, Storage and Networks.	Databases - Introduction, Queries, Data Types, Planning Databases	Theory - Environmental impact of using ICT. Cultural impact and net neutrality.	Programming with Python Unit 2.1 - Searching and Sorting Algorithms	Revision for Exams
Summer 1	ICT Music Festival - Introduction to Spreadsheets, presenting data and incorporating /developing digital images.		Data Science - Learn about modern computing and Future technologies.	Databases - Introduction, Queries, Data Types, Planning Databases	Exam preparation and reconsolidation time.	Programming with Python	Revision for Exams
Summer 2	Small Basic - Text-based programming.	Media Project	Sonic Pi	Theory - Hardware / Software	Exam preparation and reconsolidation time.	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**	

Key Assessment Objectives - Current Year 10 and Beyond

The 4 key learning objectives in Digital IT are;

AO1 Demonstrate knowledge of facts, terms, processes and issues in relation to digital information technology

AO2 Demonstrate an understanding of facts, terms, processes and issues in relation to digital information technology

AO3 Apply an understanding of facts, terms, processes and issues in relation to digital information technology

AO4 Make connections with the concepts, issues, terms and processes in digital information technology

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.

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.

Careers that the student of **Level 1/2 Vocational Award ICT (Technical Award)** supports include:

- Secondary School Teacher
- Web designer
- Graphics design
- Video production
- Social media publicist
- Media Marketing Director

How can Digital IT support your future?
There are a wide range of Digital IT & media based courses offered to post-GCSE students at colleges and sixth form providers including our own.
Due to Digital IT 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.