ICT/COMPUTING

ICT/Computing Curriculum Intent

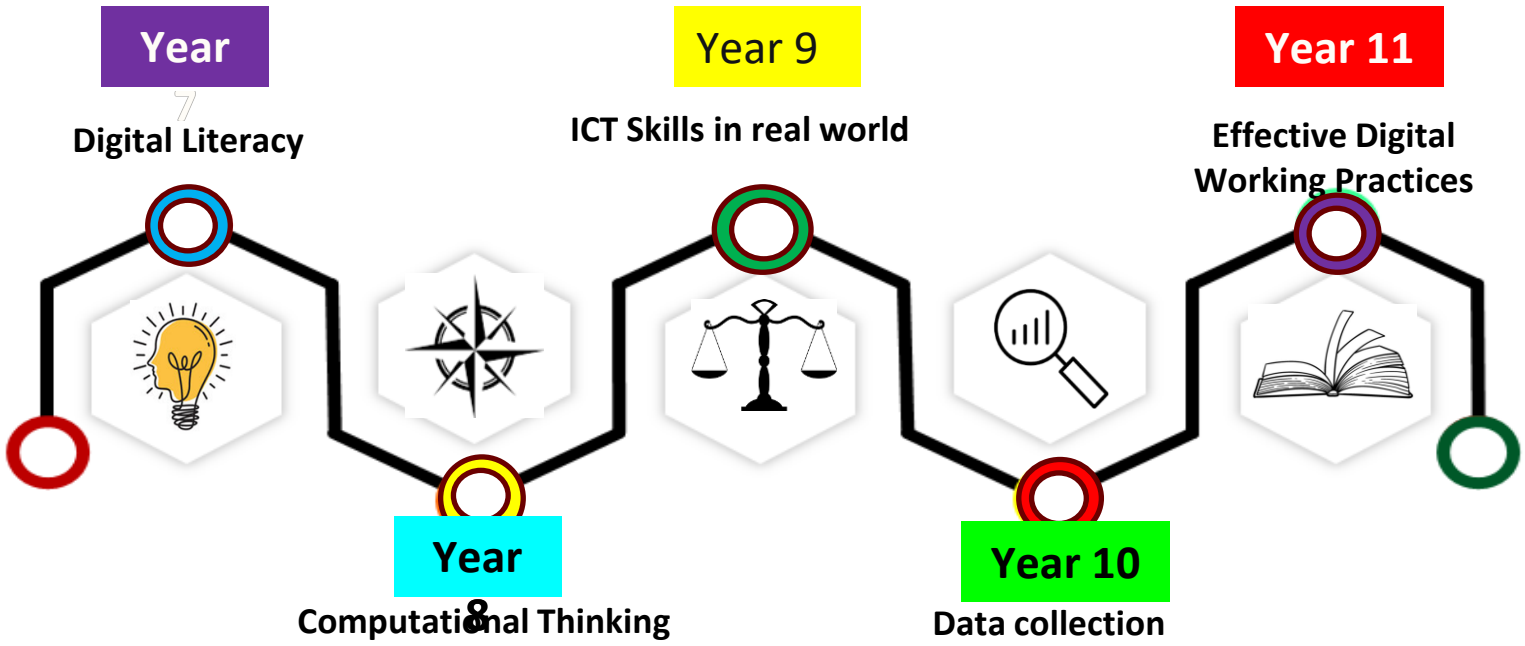
The Computing department passionately believes that students deserve a Computing and ICT curriculum which prepares them for the digital and fast paced world they live in. ICT and Computing gives young people the skills and abilities to engage positively with the digital and global world. They learn how products and business systems work, the skills that businesses require to thrive, with ICT skills that then can lead onto programming skills that make creative use of a variety of resources including traditional and digital technologies, and how these all help improve the world around them and for them to become a valued member of a digital society.

CURRICULUM LESSONS ALLOCATED OVER THE WEEKLY TIMETABLE

Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13
1	1	1	2.5	2.5	5	5

INSPIRE	MOTIVATE	ACHIEVE
In Computing lessons will engage students as their is a plethora of different topics to engage students, from both an ICT and a Computer Science perspective. These lessons will incorporate both the theoretical and practical elements of computing. Lessons will engage students as it allows students to link the topics to real world situations. Lessons are planned and delivered to promote students to engage within the subjects, whether its engaging students to stretch themselves in theoretical work, or to get the students to develop programs or become creative within their work. Lessons will inspire students in the subject by allowing the students to find their own mistakes and correct them, in order for students to develop their own understanding	A motivated learner in Computing looks like a pupil who is actively engaged in the lessons and is participating within the lessons, constantly asking the teacher for directions or further knowledge. A motivated learner is a pupil is clearly enjoying the subject and enjoys turning up to the lessons	In computing, success looks like students who are enjoying the various aspects of the subject and succeeding in their progress within the subject. In Computing a Linguist looks like someone who can confidently work and program using computer coding. The skills they have show that they can tackle a task and fix errors within programs. These skills are evidenced in the curriculum by the use of practicing programming and fixing issues with code in order for it to work successfully.

SUBJECT CURRICULUM THEMES



Cross Curricular links

- Mathematics - Binary, Logic Gates, Formulas, Data Science
- Science - Data Collection in Data Science
- History - History of computing
- Art - Digital Media, Vector Graphics, Canva design, Representation of Audio Visual

CONTINUING THE CURRICULUM PATH

Future Pathways

- Software Development
- Network Engineering
- Cybersecurity
- IT Support
- Database Management
- Artificial Intelligence
- Data Science
- Robotics
- Game Development
- UX Design

WLA ICT/Computing

Curriculum theme:

Digital Literacy

*The focus in **Year 7** is to develop a thorough knowledge of Digital Literacy in the ICT curriculum. We want to develop students passion for using ICT tools and applications in the creation of digital resources.*
The focus this year is to develop ICT skills and carry them through an array of different applications.

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6. Computer Networks

To understand how computer networks work and how computers can talk to each other. From this students will understand the importance of staying safe when communicating over a network

Assessment: Plan out a Computer network using a scenario and knowledge retention through Baseline assessments at the start and end of topic
Real outcome: Pupils develop an understanding on how this can develop into Cyber Safety

5. Cyber Security

Students are to understand the difference between data and information and what we can do with Data.
Assessment: Knowledge retention through Baseline assessments at the start and end of topic
Real outcome: To understand how Cyber Security is an integral part of our digital lives.

4. Programming in Scratch

Understand several key algorithms that reflect computational thinking; use logical reasoning to compare the utility of alternative algorithms for the same problem. Use a programming language to solve a variety of computational problems; make appropriate use of data structures; design and develop modular programs that use procedures or functions

Assessment: Create a series of computer games using Scratch and knowledge retention through Baseline assessments at the start and end of topic
Real outcome: To be able to develop programming skills using modular programs

3. Spreadsheets Modelling

Understand several key spreadsheet formulae, from this being able to program spreadsheet models and develop an understanding on how spreadsheets can be used in real world applications.

Assessment: Create a series of spreadsheets and knowledge retention through Baseline assessments at the start and end of topic
Real outcome: To embed their Knowledge and understanding on spreadsheet models into real world applications and to integrate their understanding into other curriculum areas.

2. E-Safety

Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns.

Assessment: Develop and understanding and awareness of staying safe on the internet using scenarios and knowledge retention through Baseline assessments at the start and end of topic

Real outcome: Building awareness of using ICT effectively

1. Introduction to ICT at WLA

Students will be introduced to the ICT department and develop a Knowledge and Understanding to how to use the various devices here at West Lakes Academy. Students will be introduced be able to log on and acclimatise with all the apps and programs that they will use not only in ICT and Computing, but also on their iPads.

Assessment: Password retention and expectations
Real outcome: Demonstration on how to use the ICT and Digital equipment

WLA ICT/Computing

Curriculum theme:

Computational Thinking

*The focus in **Year 8** is to develop a thorough knowledge of Computational Thinking. We want to develop students understanding to how computers think and work. The focus this year is to develops students knowledge of how computer work through various applications.*

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6. Artificial Intelligence

This unit gives students a first insight into the fascinating world of Artificial Intelligence and Machine Learning. Pupils begin by considering where AI is used from simple problems such as solving a maze to those more advanced, such as self-driving cars.

Assessment: Knowledge retention through Baseline assessments at the start and end of topic
Real outcome: To understand how AI is used to everyday lives and how technology is rapidly changing

5. Spreadsheets Modelling

To expand the skills from Yr7 in creating a data model.

Assessment: Creating a spreadsheet model and knowledge retention through Baseline assessments at the start and end of topic
Real outcome: To embed their Knowledge and understanding on spreadsheet models into real world applications and to integrate their understanding into other curriculum areas.

4. History of Computing

Pupils are to develop an understanding of how computers and the topic of computing has developed over time, learning from how computing has helped since WWII and how AI has developed through the use of technology.

Assessment: Portfolio of work and Knowledge retention through Baseline assessments at the start and end of topic
Real outcome: Pupils to understand how computing has developed

3. Python Programming

Students use textual programming language, to solve a variety of computational problems; make appropriate use of data structures; design and develop modular programs that use procedures or functions.

Assessment: Creations of Python programs from defined activities and knowledge retention through Baseline assessments at the start and end of topic
Real outcome: To understand how the extension of programming using modular code, such as Scratch, how this can be developed into understanding programming using textual language

2. Developing for the web

Pupils will build on their knowledge of computer programming from the Scratch unit, from this further develop their programming skills and combine this with their creative skills and from this pupils will create their own website using HTML and CSS. Pupils will develop their understanding of the programming language through a series webpages that the students will create

Assessment: The creation of a website and knowledge retention through Baseline assessments at the start and end of topic
Real outcome: To be able to create a website of their choice

1. Representations

To understand how computers understand and learn using their own language. Pupils will develop their knowledge on how computers communicate using Binary and from this how it can be translated into letters, numbers, symbols and colours. Students will also understand Logic gates and why they are important when learning about Computer systems.

Assessment: Knowledge retention through Baseline assessments at the start and end of topic
Real outcome: To develop an understanding of Binary and how computers communicate

Year 7 recap

We will be revisiting all of the skills and knowledge developed in Year 7. Throughout all of the units in Year 8, we will be adding to the layers of prior knowledge and developing our skills and knowledge further.

WLA ICT/Computing

Curriculum theme:

ICT Skills in the real world

*The focus in **Year 9** is to develop a thorough knowledge of how of to use ICT skills in the real world and embedding these skills into real world and future career pathways*

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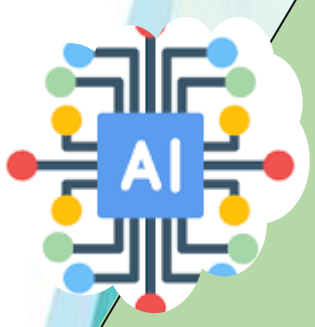
6. Digital Literacy

Students will develop an understanding of how AI and Digital Literacy skills are used within a scenario based activity. Within this unit students will create a Digital Guidebook, from this students will research and use reliable sources, and understanding how to utilise collaboration tools.

Assessment: Developing a Digital Guidebook
Real outcome: To understand how to effectively use cloud based collaboration tools, and use reliable sources of information.



5. Artificial Intelligence

This unit gives students a first insight into the fascinating world of Artificial Intelligence and Machine Learning. Pupils begin by considering where AI is used from simple problems such as solving a maze to those more advanced, such as self-driving cars. Students will then look at how machine learning and deep learning are used in image recognition. This is a fast moving area of development, so the Ethics of AI is considered. The following lessons give an opportunity to develop AI programs such as a simple image recognition system, a virtual assistant and a sentiment analysis system for film ratings.
Assessment: Knowledge retention through Baseline assessments at the start and end of topic
Real outcome: To understand how AI is used to everyday lives and how technology is rapidly changing

4. Cyber Security

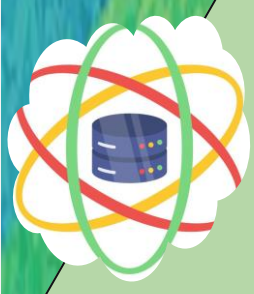
Students are to understand the difference between data and information and what we can do with Data. Students are to understand what is meant by social engineering and understand what are the common cyber threats and what the basic protections methods are.

Assessment: Developing an understanding of cyber attacks to real life companies and knowledge retention through Baseline assessments at the start and end of topic
Real outcome: To understand how Cyber Security is an integral part of our digital lives.

3. Project Management

Students are to develop an understanding of project management tools. Students are to relate this to creating a user interface. Students will develop an understanding of how to develop an UI that is accessible by all people. From this students will understand project methodologies and learn how to plan a project using project management tools. Students will then create an interface through a design and then review and evaluate the final interface.

Assessment: Project management Project and knowledge retention through Baseline assessments at the start and end of topic
Real outcome: Students will be able to create a User Interface and from this use project planning techniques.



2. Data Science

Students are to developing an understanding of data, looking at the analysis and correlation, data wrangling and representation, statistics and machine learning,

Assessment: Evaluating and analysing real life data and Knowledge retention through Baseline assessments at the start and end of topic
Real outcome: To understand how we can use data with real world applications and analyse data.

1. Python

Students use textual programming language, to solve a variety of computational problems; make appropriate use of data structures; design and develop modular programs that use procedures or functions. In Yr9 the pupils will be extending their knowledge of Python from Year 8.
Assessment: Creations of Python programs from defined activities and knowledge retention through Baseline assessments at the start and end of topic

Year 8 recap

We will be revisiting all of the skills and knowledge developed in Year 8. Throughout all of the units in Year 9, we will be adding to the layers of prior knowledge and developing our skills and knowledge further.

WLA ICT/Computing

Curriculum theme:

ICT Skills in the real world and Data Modelling

*The focus in **Year 10** is to develop a thorough knowledge of how of to use ICT skills in the real world and embedding these skills into real world and future career pathways. Students will also use Data Modelling Tools to manipulate data. This will follow the BTEC Tech Awards Level 1 & 2 Digital Information Technology Course*

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3. Effective Digital Working Practices

Learners will explore how organisations use digital systems and the wider implications associated with their use.

Assessment: External assessment set and marked by Pearson, completed under supervised conditions.

2. Collecting, Presenting and Interpreting Data

Learners will understand the characteristics of data and information and how they help organisations in decision making. They will use data manipulation methods to create a dashboard to present and draw conclusions from information. In order to make decisions, organisations collect vast amounts of data from a range of different sources. They need to use appropriate data-collection methods and ensure that the data is of sufficient quality to enable decision making. Data must then be converted into information to allow it to become useful. Even when data has been converted into information, it will not provide any conclusions on its own. It is up to the data user to be able to look at the information and draw conclusions, so how the information is presented is key to ensuring that effective and accurate decisions are made. In this component, you will learn the different data manipulation tools that can be used to change the way that data is presented. You will provide clear summaries of the data and present them in a dashboard that will allow organisations to make effective decisions. You will learn the different presentation features that can be used to ensure that information is understood clearly in an objective way so that it is not misinterpreted. You will develop your understanding of how to represent information in different ways to give it more meaning.

Assessment: Non-exam internal assessment set by Pearson, marked by the centre and moderated by Pearson

1. Exploring User Interface Design Principles and Project Planning Techniques

Learners will develop their understanding of what makes an effective user interface and how to effectively manage a project. They will use this understanding to plan, design and create a user interface. As digital technologies and organisations continue to evolve, each new development offers new and exciting ways of completing tasks and interacting with our hardware devices and opens a new project with a new set of user requirements that needs to be solved. User interfaces allow individuals and individuals in organisations to interact with digital technologies. The design of the user interface is crucial in ensuring that users can interact positively with their hardware devices. In this component, you will learn different project planning techniques that can be used to plan and deliver a project that meets a set of user requirements. You will learn the different design principles that can be used to design effective user interfaces and apply appropriate project planning techniques to create a user interface that meets user requirements.

Assessment: Non-exam internal assessment set by Pearson, marked by the centre and moderated by Pearson

Year 9 recap

We will be revisiting all of the skills and knowledge developed in Year 9, from the Project Management unit. Throughout all of the units in Year 10, we will be adding to the layers of prior knowledge and developing our skills and knowledge further.

WEST LAKES ACADEMY

WLA ICT/Computing

Curriculum theme:

Effective Digital Working Practices

*The focus in **Year 11** is to develop a thorough knowledge of how to effectively use Digital working practices to complete real world scenarios.*

This will follow the BTEC Tech Awards Level 1 & 2 Digital Information Technology Course

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Potential destinations

Study of the qualification as part of Key Stage 4 learning will help learners to make more informed choices for further learning, either generally or in this sector. The choices that learners can make post-16 will depend on their overall level of attainment and their performance in the qualification. Learners who generally achieve at Level 2 across their Key Stage 4 learning might consider progression to:

- A Levels as preparation for entry to higher education in a range of subjects
- study of a vocational qualification at Level 3, such as a BTEC National in IT, which prepares learners to enter employment or apprenticeships, or to move on to higher education by studying a degree in the digital sector.

1. Effective Digital Working Practices

Learners will explore how organisations use digital systems and the wider implications associated with their use.

Modern organisations are increasingly reliant on the use of digital systems to complete every day, business-critical tasks. The development of these systems has presented organisations with many opportunities to work in new, inventive and flexible ways to achieve their aims. The systems have also brought new challenges and a range of responsibilities. This component will give you an opportunity to explore how the developments in technology over recent years have enabled modern organisations to communicate and collaborate more effectively than ever before. The component is designed to allow you to explore the digital systems available to organisations and how their features have an impact on the way organisations operate. You will explore how developments in technology have led to more inclusive and flexible working environments, and how regulation and ethical and security concerns influence the way in which organisations operate. You will analyse information in a range of vocational contexts so that you develop a greater understanding of the use of digital systems by organisations and so that you are able to make reasoned judgements on the systems. In this component, you will learn about how organisations can use technology safely and about the cyber security issues when working in a digital organisation.

Assessment: External assessment set and marked by Pearson, completed under supervised conditions.

Year 10 recap

We will be revisiting all of the skills and knowledge developed in Year 10. Throughout all of the units in Year 11, we will be adding to the layers of prior knowledge and developing our skills and knowledge further.

WEST LAKES ACADEMY

WLA ICT/Computing

Curriculum theme:

Critical learning and lateral thinking

*Students in **Year 12** will study the **Pearson Level 3 Alternative Academic Qualification BTEC National in Information Technology (Extended Certificate)** allows students to study the fundamental knowledge of Information Technology covering the role and implications of using Information Technology systems and cyber-security threats and how to manage attacks. Students will also develop important skills for creating websites to meet a specific purpose and to manage data through the development of a relational database solution.*

Course Commencement September 2027

Potential destinations

The qualification has been developed in consultation with higher education representatives and sector experts to ensure students have the knowledge, understanding and skills they need to progress to, and thrive, in higher education. The qualification has four mandatory units covering the following topics: · Information Technology Systems
· Cyber Security and Incident Management
· Website Development
· Relational Database Development

This qualification can lead to progression to the following degrees: · BA Business Studies · BSc Information Systems · BSc Computer Science

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2. Unit 1: Information Technology Systems

IT systems have a significant role in the world around us and play a part in almost everything we do. Having sound knowledge and understanding of how to effectively select and use appropriate IT systems will benefit you personally and professionally. You will explore the relationships between the hardware and software that form an IT system, how systems work individually and together, and the relationship between the user and the system. You will examine issues related to the use of IT systems and the impact that they have on organisations and individuals. This unit will give you a fundamental understanding of all areas of IT, supporting your progression to an IT-related higher education course.

Assessment: This unit is externally assessed through a written examination set and marked by Pearson.

1. Unit 3: Website Development

Website development skills are more essential than ever if you want to be noticed, reach your goals and generate interest in today's sophisticated, competitive and dynamic online environment. Modern lifestyles are digitally driven and as a website developer you must combine different tools and techniques to capture and maintain the user's interest. Website developers need to understand and acquire the necessary skills to find solutions to a variety of scenarios and problems. In this unit, you will explore how existing websites use the principles of website development to appeal to their intended audience and meet their specific purpose. You will plan, design and develop a website in response to a client brief by applying website development tools, techniques and processes. You will also reflect on the usability, functionality and fitness for purpose of the website using a testing and review process. Many software developers, database experts and systems managers need web-client development skills as an integral part of their overall portfolio of expertise. This unit will benefit you to progress on to information technology courses in higher education.

Assessment: Non-exam internal assessment set by Pearson, marked by the centre and moderated by Pearson
In this unit you will:
A Understand how the principles of website development are used to create effective websites.
B Explore website design skills and techniques to meet client requirements.
C Develop a website to meet client requirements.

GCSE recap

We will be revisiting all of the skills and knowledge developed in Year 10& 11. Throughout all of the units in Year 12, we will be adding to the layers of prior knowledge and developing our skills and knowledge further.

WLA ICT/Computing

Curriculum theme:

Critical learning and lateral thinking

*Students in **Year 13** will study the **Pearson Level 3 Alternative Academic Qualification BTEC National in Information Technology (Extended Certificate)** allows students to study the fundamental knowledge of Information Technology covering the role and implications of using Information Technology systems and cyber-security threats and how to manage attacks. Students will also develop important skills for creating websites to meet a specific purpose and to manage data through the development of a relational database solution.*

Course Commencement September 2028

Potential destinations

The qualification has been developed in consultation with higher education representatives and sector experts to ensure students have the knowledge, understanding and skills they need to progress to, and thrive, in higher education. The qualification has four mandatory units covering the following topics: · Information Technology Systems
· Cyber Security and Incident Management
· Website Development
· Relational Database Development

This qualification can lead to progression to the following degrees: · BA Business Studies · BSc Information Systems · BSc Computer Science

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2. Unit 4: Relational Database Development

Databases underpin many processes in numerous aspects of modern society. From stock control systems for large multi-outlet online retailers to the smallest niche internet forums, databases are a repository of information that make up the world wide web as we know it. Database developers understand and use practical skills utilising technologies that will enable them to design and develop databases that can be used by many different connecting systems. In this unit, you will examine the structure of data and how an efficient data design follows through into an effective, useful database. You will investigate database management systems (DBMS) and apply practical skills in designing and developing a database within a given DBMS. This unit will provide you with the knowledge, and skills needed for progression on to higher education programmes in Information Technology.

Assessment: Non-exam internal assessment set by Pearson, marked by the centre and moderated by Pearson
In this unit you will:
A Understand how the principles of relational database models, data storage and normalisation are used to create effective relational database solutions.
B Design a relational database solution to meet client's requirements.
C Develop a relational database solution to meet client's requirements.

1. Unit 2: Cyber Security and Incident Management

Our increasing reliance on computer systems and the data they contain makes us vulnerable to attacks from cyber criminals and to the loss of these systems if there is an accident or a natural disaster. As Information Technology (IT) system security is improved, more sophisticated methods of attack are developed, and it is important that organisations have robust plans in place to deal with a cyber security incident before it occurs. All IT professionals require a good understanding of the current threats to systems, how to apply appropriate and effective protection methods and how to manage a cyber security incident. In this unit, you will examine the many types of cyber security attacks, the vulnerabilities in networked systems and the techniques that can be used to defend an organisation's networked systems. You will examine scenarios and explain appropriate protection measures for networked systems. You will also look at the forensic methods used to investigate cyber security incidents and analyse the suitability of those methods for a given scenario. As IT systems evolve, there is an increasing need for IT professionals to protect networked systems and the information they contain, while providing enhanced features and benefits for organisations, customers and individuals. This unit will help prepare you for IT courses in higher education.

Assessment: This unit is externally assessed through a written examination set and marked by Pearson

Year 12 recap

We will be revisiting all of the skills and knowledge developed in Year 12. Throughout all of the units in Year 13, we will be adding to the layers of prior knowledge and developing our skills and knowledge further.