Computing

Curriculum Principles

Our uniting 'sentence' is: "We provide students with vital life skills which will be utilised in employment or further education. All our students will be capable and confident whilst using technology whilst still being responsible digital citizens".

By the end of their education, a student of Computing at Dixons Unity Academy will:

At the end of years 7 and 8 students will have been exposed to the following: programming in code and block-based languages, E-Safety, presentation, spreadsheet, hardware and software, web design, data representation and control systems.

- At key stage 3 they will have experienced; understanding of key algorithms that reflect computational thinking; programming languages to solve computational problems; understand simple Boolean logic; understand the hardware and software components that make up computer systems; understand how instructions are stored and executed within a computer system; undertake creative projects that involve selecting, using, and combining multiple applications and understand a range of ways to use technology safely, respectfully, responsibly and securely.

- Students studying the Digital Information Technology will 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

To achieve a true understanding of Computing, topics have been intelligently sequenced based on the following rationale:

- At Key Stage 3 students are taught content that they can then embed in Key stage 4. They are therefore given a hands-on approach in undertaking the above topics.

- At Key Stage 3, students work through learning diaries, which are designed for students to follow a sequence of lessons, feedback on what they have learnt and complete spacing and retrieval practice to ensure knowledge is embedded.

- Students will then by the end of Key stage 3 have used two programming languages, be aware of how technological is used responsibly and will have foundation knowledge of how computational thinking works and operates.

- At Key Stage 4 there is a practical approach to the units covered where students are taught how to use basic and advanced tools to create a variety of products to a high standard.

- There will be opportunities for retrieval practice and exploration activities to allow students to develop their skills in preparation for their formal assessment in the form of assignments. We also use spaced practice in developing the skills to the exam component and preparing for answering exam questions. These components use Level one / two Pass, Merit and Distinction grading criteria.

- Digital Information Technology is a vocational subject, which therefore means through most of the time, they provide students with the opportunity to demonstrate their skills in assignment-based tasks, rather than the traditional preparation for examinations as would be with GCSE subjects. Both courses do have one examination element, which is completed in year 11.

The Computing curriculum will address social disadvantage by addressing gaps in students' knowledge and skills":

- Students are provided with access to computing facilities and a range of software that they otherwise may not be able to access.

- Any misconceptions or gaps from primary are addressed throughout Key Stage 3. This is intertwined into each lesson using Learn now, iterative content and assessment for learning strategies to ensure all students have the basic skills to access the curriculum.

- When completing work at KS4, we have weekly after school intervention sessions where we can focus on key areas whilst giving one-to-one help.

- We ensure that intervention is proactive, and data driven, on a regular basis staff address the gaps identified from in-class or cycle assessment data to offer provision to eradicate these differences. We use intervention folders in classrooms, which are used daily, which identifies the disadvantaged students (and SEND / PP) and then where a weekly plan is used to ensure intervention is taking place to help students progress.

- Revision guides are provided for students to use. We also use previous exam questions as spacing and retrieval practice in Learn Now's and as homework.

- Regarding Key Stage 3, students are provided with learning diaries for each area taught and spacing and retrieval practice of homework and DIRT feedback is completed in these diaries.

- Cultural capital is addressed within every lesson teaching student's ambitious vocabulary and key terms needed for success in ICT.

We fully believe that Computing can contribute to the personal development of students at Dixons Unity Academy:

- In KS3 the project completed on e-safety provides students with the opportunity to focus on how to stay safe online.

- The completion of work in the units studied in Digital Information Technology encourage independent working in completing their assignments, creativity in the planning and design of their products (e.g., multipage website / digital graphic) and awareness of the digital media sector.

Our belief is that homework should be interleaved revision of powerful knowledge that has been modelled and taught in lessons. This knowledge is recalled and applied through a range of low stakes quizzing and practice.

Opportunities are built in to make links to the world of work to enhance the careers, advice, and guidance that students are exposed to:

- Links to careers in computing as well as apprenticeships and higher education opportunities are discussed throughout each cycle. This ensure students know where ICT can lead them if they feel this is part of their personal development.

- KS4 students are provided with essential knowledge, transferable skills, and tools to improve their learning in other subjects with the aims of enhancing their employability when they leave education, contributing to their personal development and future economic well-being.

- KS4 students will be able to see how completing this course develops their skills to focus on possible future careers such as a games designer, graphic designers, and web development.

- Completing this course can also provide students with the opportunity to further their education into A Levels or apprenticeships.

- Every week students studying Computing in all year groups are provided with a learn now activity that focuses on a recent news article, enabling students to have that link to current events that are happening within the Digital Media Sector.

A true love of Computing involves learning about various cultural domains. We teach beyond the specification requirements, but do ensure students are well prepared to be successful in GCSE examinations:

- At Key Stage 3, students learn many IT skills (e.g., spreadsheets and presentations) which can be transferred into many other subjects. These practical transferable skills students master such as self-reflection, communication, teamwork, and problem solving will also support their progress in the present and the future.

- Creative iMedia and Digital Information Technology provides students with the opportunities to develop useful transferable skills such as research, planning, and review, working with others and communicating creative concepts effectively.

- At Key Stage 4, students will have the opportunity to learn about how the changes in working practices due to the use of ICT in creative media and Digital Information Technology have impacted upon the environment e.g., fewer carbon emissions due to more online/remote working and therefore less travel and environmental issues connected to the production, and disposal of ICT resources.

- At Key Stage 4, students will also explore the effect on natural resources in the creation and of ICT systems used in creative media and Digital Information Technology including the environmental impact of digital devices and their use.

Procedural knowledge (skills) that ais developed:

- Acquiring and applying knowledge of the use of algorithms in computer programs to solve problems.

- Developing computer programs to solve problems.

- Evaluating the effectiveness of computer programs/solutions and the impact of, and issues related to, the use of computer technology in society.

- An understanding of current and emerging technologies, how they work and applying this knowledge in a range of contexts.

- The development of project management skills.

How we go above the national curriculum in computing:

- Students by the end of Key stage three will have learnt three programming languages.

- They will be aware of career links and opportuinities within the ICT curriculum.

- Students will look at the social, moral, and ethical concerns within AI.

- Students will know and understand the implications of technology on stakeholders.

- Students will be fully aware of laws pertaining to ICT.

- During year 8 students will be creating an interactive Powerpoint presentation on supporting a local charity. This provides them with an insight into marketing, campaining as well as using IT skills to improve social awareness.

Curriculum Overview

All children are entitled to a curriculum and to the powerful knowledge which will open doors and maximise their life chances. Below is a high-level overview of the critical knowledge children will learn in this subject, at each key-stage from Year 7 through to Year 11, to equip students with the cultural capital they need to succeed in life. Our powerful, knowledge-rich curriculum teaches both **substantive knowledge** (facts, knowing that something is the case; what we think about) and **procedural knowledge** (skills and processes; knowing how to do something; what we think with). There are no skills without bodies of knowledge to underpin them. The curriculum is planned vertically and horizontally giving thought to the optimum knowledge sequence for building secure schema.

		Cycle 1	Cycle 2	Cycle 3
Year 7	**New learning**	ICT skills and E-Safety How to be an active digital citizen. Moral and ethics of using technology SMSC links with technology.	Scratch and spreadsheets Computational thinking and algorithmic sequencing. How to use technology in a real-life setting.	Hardware and software, Interactive presentations Building confidence in their technical ability. How technology works and operates
	Revisited learning	Continually revisit IT skills e.g., saving documents How to be safe online and what to do if you are in danger online	Continually revisit IT skills e.g., saving documents Block based programming is revisited from primary education to use as a foundation for computational thinking.	Continually revisit IT skills e.g., saving documents Input and output devices are revisited from KS2.
	Additional information	Students should be given passwords for PC and Email Students should by the end of cycle three all be able to log on independently and be able to open their online workbooks.	Cycle assessment to review all that has been covered. Career links to computational thinking will be included. We will look at roles which require this skill, qualifications needed and next steps for these roles.	Cycle assessment to review all that has been covered. We will address the social moral, cultural and ethical ways hardware is used and disposed of.
Year 8	**New learning**	IT skills-Photo shop and working to a design brief. Support for a cause-using IT skills to create an interactive presentation to support a local charity.	Python and Data representation. Binary addition and subtraction as well as a second programming language.	HTML. How AI thinks and operates. How websites are created and programmed.
	Revisited learning	ICT skills - ensure students revisit file creation, saving documents, naming documents etc. Resilience in completing tasks independently and building ICT skills.	Scratch programming as an introduction to Python Computational thinking and how computers operate	Continually reviewing IT skills. Computational thinking.
	Additional information	Review of IT skills important for future assessment for options in year 9	Using logical reasoning to develop ideas. Understanding how programming languages work and why we use them.	We will be going beyond the curriculum with SMSC in regards to AI and its impact on our society.
Year 9	**New learning**	Digital Information Technology - Component one User interfaces and accessibility needs. Audience needs and Design principles.	Digital Information Technology component one. Project planning tools and creating dashboards.	Completing Pearsons set assignment Component 1
	Revisited learning	Adding in reminders of file structure and saving documents. Using PowerPoint and snipping tool.	User interfaces, accessibility needs, house style and branding. Using Software being digitally literate.	User interfaces, accessibility needs, house style and branding. Using Software being digitally literate.
	Additional information	This learning will form a basis for the internal assignment brief.	This learning will form a basis for the internal assignment brief.	This will be the first part of the internal assessments required for

		Cycle 1	Cycle 2	Cycle 3
Year 10	**New learning**	Start of teaching for Component One. Internal assessment Address any gaps in knowledge prior to completing internal assessments.	Teaching of component two - Spreadsheet skills and vlookups.	Making improvements from feedback provided. Teaching Component 3 content- Networks, cybercrime Moral and ethical dilemmas for business with technology. Cloud computing
	Revisited learning	Sept - Oct: review of component one before assessment	Spreadsheet skills and use of software to complete tasks.	Component two resubmission.
	Additional information	Official assessment taken in assessment window: October to December	Complete component two assesment window is January - March	Resubmissions to be completed for component two.
Year 11	**New learning**	Any misconceptions or gaps in knowledge prior to resitting component one.	Component three Data Flow diagrams, modern teams.	Component three impact of security breaches on stakeholders.
	Revisited learning	Component one internal assessment resit.	Cybercrime and SMSC ICT content	Cloud computing and networks
	Additional information	Resit October-March	Exam in June	Exam in June

Y7 Long Term Plan

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
	Induction					**Assessment Weeks**							
Cycle 1	Increase personal security through recognising and creating strong and memorable passwords	To identify the purpose and usage of several types of Microsoft applications	To identify the purpose and usage of Microsoft PowerPoint	To identify the purpose and usage of Microsoft Excel	To examine the purpose of having sensible file and folder structures	Understand the different ways we use the internet and how to search the internet	To examine the purpose of using email and identify key features of email applications	Assessment to check understanding	Learning about the dangers of the internet and how it is important to know about strangers online	Learning to stay safe when using social networking sites and using chat rooms	Learning about cyberbullying and the impact it could have on individuals	Learning about protecting yourself and your computer from the dangers online	Learning to create a Cyberbullying comic that is suitable for year 6 students
						Assessment Weeks							
Cycle 2	Careers link (ADO)	Scratch: Able to programme to move objects - Create your own sequence of instructions Use blocks efficiently	Change sprites, background, and sound	Creating and using Co-ordinates Experiment by modifying "sprites." Add coding to the sprites to move	Using variables to set up a game	Setting up a game Create the sprites and background for the game. Completion of the game, students to review each other's games and evaluate	Cycle Assessment	Spread sheets: Create a simple model using formulae and make use of basic formatting features	How to write a formula to calculate the total, average, lowest and highest from a range of numbers	Create a variety of different, suitable, correctly labelled charts	How to pick up a value from another sheet using a cell reference	Why it is important to plan things before you create them on the computer	Careers link (ADO)
								Assessment Weeks					
Ccycle 3	Hardware and software Learn about different parts of a computer and how they work	Learn what the role and function of software is	Learn what input and output devices are	Learn what storage devices are and how they work	Learn about different types of networks	Careers link (ADO)	To understand the importance of planning - To begin planning your endangered animal's interactive presentation	To examine which images would be appropriate for an endangered animal's interactive presentation. To begin adding images to your interactive presentation	Cycle Assessment	To understand how text should be presented in an interactive presentation to begin adding text to your interactive presentation	To learn how to add transitions, animations, and effects to our interactive presentation	To evaluate your interactive presentation to find areas that could be enhanced	

Y8 Long Term Plan

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
	Induction					**Assessment Weeks**							
Cycle 1	Ensure have passwords, review of log ins and E-safety	IT skills review over Microsoft Word and PowerPoint	IT skills Photo shop skills working to a design brief	IT skills Photoshop skills and working to a design brief	IT skills, Photo shop skills and working to a design brief	Careers link (ADO)	Cycle Assessment	Support for a cause-Using IT skills for marketing	Support for a cause-Creating an interactive presentation on PowerPoint	Support for a cause-Creating an interactive presentation on PowerPoint	Support for a cause-Gantt charts and research methods	Review final interactive presentation	Present presentation
						Assessment Weeks							
Cycle 2	Python: Understand and use practical programming skills. Set variables. Use built in procedures	Understand that computers need precise instructions. Use If statements in a program. Set variables. Find and correct simple design problems in a program	Use built in procedures. Use If statements in a program. Set variables. Find and correct simple design problems in a program	Students creating a quiz in Python - selecting choice of questions and code needed to show response to right / wrong answers	Students creating a quiz in Python - selecting choice of questions and code needed to show response to right / wrong answers	Students ensuring all aspects of their quiz are complete	Students' complete evaluation of each other's quizzes after playing them	Data representation Learning to count in binary and convert between decimal and binary	Learning how binary is used to represent numbers, converting the numbers accurately	Learning the process of binary addition, do simple addition and propagated carries correctly	Learning how bitmaps are used to represent images with binary – convert a black and white image to binary	Learning how bitmaps are used to represent images with binary – convert an indexed colour image to binary	Careers (ADO)
								Assessment Weeks					
Cycle 3	Computational thinking Learning about the different control system used in everyday life	Learning how to recognise different flowchart symbols and how to put them together	Learning how to create a flowchart to show the Comp. Thinking e.g., how a toaster works	Learning how to recognise and fix mistakes in the flow diagrams	HTML: You will be learning about the structure of a web page. Use the correct tags in the correct places and extend your work with additional headings and lists.	You will be learning how to add text and bullet lists using HTML tags. Create unordered lists that have the correct opening tags and show correctly in a web browser	You will be learning how to create tables using HTML tags. Alter and extend existing tables by adding extra columns or rows	Careers (ADO)	Cycle Assessment	You will be learning how to create hyperlinks using HTML tags, create three working hyperlinks to different webpages using HTML tags	You will be learning how to design, create and link web pages for an entire web site using HTML tags. Create a website using HTML with at least three pages linked together with working hyperlinks	Create a website using CSS and HTML with multiple pages linked together with working hyperlinks	

Y9 Long Term Plan

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
Cycle 1	**Induction** / Comp.One A1 User interfaces	A1 Continue User Interfaces	A1 complete user interfaces A2 Audience needs	A2 Audience needs	A2 Audience needs. A3 Design Principles	A3 Design Principles	**Assessment Weeks** A3 Design Principles	A4 Designing and efficient user interface	A4 Designing and efficient user interface	A4 Designing and efficient user interface	Introduce practice assignment requirements. Research time on LAA and prepare notes	Research time on LAA and prepare notes	LAB B1 Project planning techniques
Cycle 2	LAB B1 Project planning techniques	LAB B1 Project Planning techniques	B2 Creating a project proposal and plan	B2 Creating a project proposal and plan	B2 Creating a project proposal and plan	Revision for cycle assessment	**Assessment Weeks** Cycle assessment	B3 creating an initial design	B3 creating an initial design. (Also, DIRT of assessment)	B3 creating an initial design	B4 Developing a user interface	B4 Developing a user interface	B4 Developing a user interface
Ccycle 3	Comp. One Review of LAA: User interfaces, audience needs, design principles	Comp. One Review of LAA: User interfaces, audience needs, design principles	Review of LAB: Project planning and creating a project proposal	Review of LAB: Project planning and creating a project proposal	Review of LAC: C1 Review Intro. to the assign. and expectations	Pearson set assessment	Pearson set assessment	**Assessment Weeks** Pearson set assessment	Pearson set assessment	Pearson set assessment	Resub for improvements	Resub improvements	Resub. to make improvements

Y10 Long Term Plan

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
Cycle 1	**Induction**						**Assessment Weeks**						
	Comp. One Review of LAA: User interfaces, audience needs, design principles	Review of LAA: User interfaces, audience needs, design principles	Review of LAB: Project planning and creating a project proposal	Review of LAB: Project planning and creating a project proposal	Review of LAC: C1 Review Intro. to the assign. and expectations	Cycle assesses. Move onto Pearson Set Assess.	Pearson set assess.	Pearson set assess	Pearson set assess	Pearson set assess	Start of comp two. Collecting, presenting, and interpreting data LAA: A1 Charc. of data and info.	Resub. for assess.	Comp. Two LAA: A1 Character. of data and info.
Cycle 2							**Assessment Weeks**						
	Comp. Two LAA: A1 Character. of data and info.	A2: Representing information	A3 Ensuring data is suitable for processing	A4 Data collection	A5: Quality of information and its impact on decision making	A6 Sectors that use data modelling	A7 Threats to individuals	Intro to practice assess. Time to research and make notes	Complete practice assess. Task one.	LAB: Data processing methods Data manipulation methods	B1 Advanced data manip. methods	B1 Advanced data manip. methods	B1 Other processing methods
Cycle 3							**Assessment Weeks**						
	B2 Producing a dashboard data summary	B2 Presentation methods	B2 Presentation features Research of next task of assign. make notes	Complete practice assess. Task two	LAC: C1 Drawing conclusions based on findings of data	C2: How presentation affects understand.	Revision of final task, students study the dashboard created	Complete practice assess. Students complete task three	Revision of key points	Cycle assessment	DIRT of practice assess. Resub. of practice assess.	DIRT of cycle assess. Ensure resub. complete	Final review of key points of comp two

Y11 Long Term Plan

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
Cycle 1	**Induction**						**Assessment Weeks**						
	Component 1 Resit-Exploring user interfaces	Component 1 Resit-Exploring user interfaces	Component 1 Resit-Exploring user interfaces	Component 1 Resit-Exploring user interfaces	Component 1 Resit-Project planning techniques	Component 1 Resit-Project planning techniques	Component 1 Resit-Project planning techniques	Component 1 Resit-Project planning techniques	Component 1 Resit-Project planning techniques	Component one hand in and feedback	Component one improvements	Component one improvements	Component 1 Final submission
Cycle 2							**Assessment Weeks**						
	A1 communication technology	A1 features of cloud storage	A1 feature of cloud computing	Impact of cloud computing	A2 how modern teams are used and facilitated	A2 Modern teams and accessibility Modern teams and stakeholders	Revision Lesson/Walking Mock	Mock exam week	A2Positive and negative impact of modern tech on organisations	A2 impact of modern tech on individuals	B1 internal and external threats	B1 Impact of security breach	B2 finding weaknesses and improving system security
Ccycle 3							**Assessment Weeks**						
	B2 User access restriction and data level protection	B3 Policy security passwords and disaster recovery	C1 Responsible use policies	C2 Net neutrality and acceptable use policies	C2 Intellectual property and criminal use of computers	D1 Forms of notation-data flow diagrams, flowcharts, and tables	Component three exam						