IN UNITY WE SUCCEED

COMPUTING

2024 - 2025

N – 11 COMPUTING CURRICULUM

UNITY ACADEMY BLACKPOOL

NURSERY - YEAR 11

Nursery (Early Years)		
• Seeks to acquire basic skills in turning on and operating some digital equipment • Operates mechanical toys, e.g. turns the knob on a wind-up toy or pulls back on a friction car • Plays with water to investigate “low technology” such as washing and cleaning • Uses pipes, funnels and other tools to carry/ transport water from one place to another		
Independent use of -Cameras -Controllable Toys	Introduced to MS Paint, -Programmable toys -Ipads (ios)	Teacher modelling the use of - Interactive whiteboards - Vimeo -Websites -E books

Nursery (Pre-school)		
• Shows an interest in technological toys with knobs or pulleys, real objects such as cameras, and touchscreen devices such as mobile phones and tablets. • Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images. • Knows how to operate simple equipment, e.g. turns on CD player, uses a remote control, can navigate touch-capable technology with support. With adult support, shows an awareness of the need to keep safe with technology.		
Independent use of -Cameras -Ipads (ios) -Controllable Toys -Programmable toys	Supported use of MS Paint, Beebot app	Teacher modelling the use of - Interactive whiteboards - Vimeo -Websites -E books

Reception		
• *Completes a simple program on electronic devices.* • *Can create content such as take a photograph, draw a picture on screen.* Can use a keyboard. An awareness of keeping safe online.		
Independent use of Cameras Ipads (ios) Tablets (android) Ipods Digital photo frame Controllable Toys Programmable toys	Supported use of Keyboards Mouse Scratch Junior app, MS Paint, Beebot app RM Maths, Photo collage	Teacher modelling the use of -Visualisers - Vimeo -Websites -E books.

Year 1					
Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Technology all around us -recognise common uses of information technology beyond school	Digital Painting -Arcinbaldo -Creating faces with shapes use technology purposefully to create, organise, store, manipulate and retrieve digital content	Digital Writing use technology purposefully to create, organise, store, manipulate and retrieve digital content	Grouping Data use technology purposefully to create, organise, store, manipulate and retrieve digital content	Moving a robot understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions	Programming animations understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions
-use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on					

Year 2					
Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Information technology around us -recognise common uses of information technology beyond school	Digital Photography use technology purposefully to create, organise, store, manipulate and retrieve digital content	Making Music use technology purposefully to create, organise, store, manipulate and retrieve digital content	Pictograms use technology purposefully to create, organise, store, manipulate and retrieve digital content	Robot algorithms understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions. create and debug simple programs	Programming quizzes understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions. create and debug simple programs
-use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on					

Year 3					
Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Connecting computers understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration	Stop Frame animation select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content +3D design - Tinkercad project - Book marks	Sequencing sounds -design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts -use sequence, selection, and repetition in programs; work with variables and various forms of input and output -use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	Branching databases use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	Desktop publishing select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	Events and actions in programs -design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts +Programming drones project - Block coding Motion
-use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact.					

Year 4					
Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
The Internet understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	Audio editing select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information +3D design - Tinkercad project - Designing houses	Repetition in shapes design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts use sequence, selection, and repetition in programs; work with variables and various forms of input and output use logical reasoning to explain how some simple algorithms work and to detect	Data logging select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	Photo editing select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and informationand correct errors in algorithms and programs	Repetition in games design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts use sequence, selection, and repetition in programs; work with variables and various forms of input and output use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs +Programming drones project - Block coding Control
-use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on					

Year 5					
Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Sharing information understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	Vector Drawing select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information +3D design - Tinkercad project - Designing 3d images from 2D images	Selection in Physical computing design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts use sequence, selection, and repetition in programs; work with variables and various forms of input and output +Programming drones Block coding light	Flat file databases select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	Video editing select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	Selection in quizes design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts use sequence, selection, and repetition in programs; work with variables and various forms of input and output use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
-use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on					

Year 6					
Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Internet communication use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	Webpage creation select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	Variables in games design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts use sequence, selection, and repetition in programs; work with variables and various forms of input and output use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs +Programming drones project - Block coding Image recognition	Introduction to spreadsheets select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	3D modelling select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information +3D design - Printing using Cura	Sensing design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts use sequence, selection, and repetition in programs; work with variables and various forms of input and output use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms an
-use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on					

Year 7					
Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
7.1 Computer Systems		7.2 Computational Thinking		7.3 Programming in Scratch (1)	
This unit takes learners on a tour through the different layers of computing systems: from programs and the operating system, to the physical components that store and execute these programs. The aim is to provide a concise overview of how computing systems operate, conveying the essentials and abstracting away the technical details that might confuse or put off learners.		During this unit, learners develop their understanding of solving problems and critical thinking using the computational thinking skills such as decomposition, abstraction, algorithmic thinking and pattern recognition.		This unit is the first programming unit of KS3. The aim of this unit and the following unit ('programming 2') is to build learners' confidence and knowledge of the key programming constructs. Importantly, this unit does not assume any previous programming experience, but it does offer learners the opportunity to expand on their knowledge throughout the unit. The main programming concepts covered in this unit are sequencing, variables, selection, and count-controlled iteration. All of the examples and activities for this unit use Scratch 3.	

Year 8					
Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Programming in Scratch (2)		Networks		Representation of Data	
This unit begins right where ‘Programming I’ left off. Learners will build on their understanding of the control structures’ sequence, selection, and iteration (the big three), and develop their problem-solving skills. Learners will learn how to create their own subroutines, develop their understanding of decomposition, learn how to create and use lists, and build upon their problem-solving skills by working through a larger project at the end of the unit.		Imagine a world without computer networks: there would be no more YouTube, Google, instant messaging, online video gaming, Netflix, and iTunes; no online shopping; no file sharing; and no central backups of information. This unit begins by defining a network and addressing the benefits of networking, before covering how data is transmitted across networks using protocols.		Humans use symbols to record, process and transmit information. This unit introduces binary digits to your learners as the symbols computers use to perform these tasks and focuses on the representation of text and numbers, images and sound.	

Year 9					
Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
9.1 Impact of Technology		9.2 Python 1		9.3 Cyber Security	
This unit explores how technology is changing and how it affects the learners lives. They will explore topics such as the ethical implications of technology as well as the environmental and cultural impact of technology. Learners will look at recent developments and learn how to express their opinion on the topic as well as produce a balanced argument that looks at all impacts of technology.		This unit introduces learners to text-based programming with Python. The lessons form a journey that starts with simple programs involving input and output, and gradually moves on through arithmetic operations, randomness, selection, and iteration. Emphasis is placed on tackling common misconceptions and elucidating the mechanics of program execution. A range of pedagogical tools is employed throughout the unit, with the most prominent being pair programming, live coding, and worked examples. The previous scratch programming units are a prerequisite for this unit.		This unit takes learners on a journey of discovery of techniques that cybercriminals use to steal data, disrupt systems, and infiltrate networks. The learners will start by considering the value their data holds and what organisations might use it for. They will then learn about social engineering and other common cybercrimes, and finally look at methods to protect against these attacks.	

Year 10 (based on 3 hours a week)						
Term 1	Term 2	Term 3		Term 4	Term 5	Term 6
2 hours 1.1 Computer Systems Purpose of CPU CPU Components Von Neumann Architecture CPU Performance Embedded Systems	2 hours 1.2 Memory and Storage Primary Storage Secondary Storage Units of data Binary – Denary Hexadecimal Binary Addition Binary Shifts Characters Images Sound Compression	2 hours 1.2 Memory and Storage Primary Storage Secondary Storage Units of data Binary – Denary Hexadecimal Binary Addition Binary Shifts Characters Images Sound Compression	2 hours 1.3 Networks Types of network Performance of networks Network models LAN Hardware The internet Topologies Modes of connection Encryption IP vs MAC Addresses Protocols Protocol layers	2 hours 1.3 Networks Types of network Performance of networks Network models LAN Hardware The internet Topologies Modes of connection Encryption IP vs MAC Addresses Protocols Protocol layers	2 hours 1.4 Network Security Forms of attack: Malware, Social engineering, Brute-force, DOS, Data interception, SQL injection Common Prevention methods: Penetration testing, Anti-malware software, Firewalls, User access levels, Passwords, Encryption, Physical security	2 Hours Exam practice Revision
1 hour 2.1 Algorithms	1 hour 2.2 Programming Fundamentals				1 hour 2.3 Robust Programming	
Computational Thinking Flowcharts Pseudocode Syntax and Logic Errors Trace Tables Search Algorithms Sort Algorithms	Constants and variables Sequence Selection Iteration Operators Data Types String Manipulation File handling Arrays Subprograms SQL				Defensive design Validation *Subprograms* Maintainability Testing *Error types*	

Year 11 (based on 3 hours a week)								
Autumn 1		Autumn 2		Spring 1		Spring 2	Summer 1	Summer 2
2 hours 1.3 Networks Types of network Performance of networks Network models LAN Hardware The internet Topologies Modes of connection Encryption IP vs MAC Addresses Protocols Protocol layers	2 hours 1.4 Network Security Forms of attack: Malware, Social engineering, Brute-force, DOS, Data interception, SQL injection Common Prevention methods: Penetration testing, Anti-malware software, Firewalls, User access levels, Passwords, Encryption, Physical security	2 hours 1.5 System Software The OS: User interface, Memory management and multitasking, Peripheral management/drivers, User management, File management Utility software: Defragmentation, Encryption, Compression	2 hours 1.6 Ethics and Legislation: Ethics vs Legal Cultural Environmental Privacy The DPA The CMA Copyright Open source vs Proprietary	2 hours 2.4 Boolean Logic Logic Gates Truth Tables Complex logic gates	2 hours 2.5 Programming Languages Language Levels and Generations Compilers vs. Interpreters The Integrated Development Environment (IDE)	Exam practice Revision Algorithm and coding challenges	Exam practice Revision Algorithm and coding challenges	N/A
1 hour 2.2 programming fundamentals Constants and variables Sequence Selection Iteration Operators Data Types String Manipulation		1 hour 2.2 programming fundamentals Constants and variables Sequence Selection Iteration Operators Data Types	1 hour 2.3 Robust Programming Defensive design Validation *Subprograms* Maintainability Testing *Error types*	1 hour 2.3 Robust Programming Defensive design Validation *Subprograms* Maintainability Testing *Error types*		Exam practice Revision Algorithm and coding challenges	Exam practice Revision Algorithm and coding challenges	

File handling Arrays Subprograms SQL	String Manipulation File handling Arrays Subprograms SQL					