Computing

L.E.A.D. Academy Trust — Lead • Empower • Achieve • Drive

The Birley Academy — A L.E.A.D. Academy

Theme/Concept	(KS2)	Year 7	Year 8	Year 9	Year 10	Year 11	(Post-16)
Computer Science		(ICT Basics)	**Computer Systems** CPU Secondary storage Von Neumann Architecture	**Computing Hardware** Computer systems (Von Neumann architecture) CPU instruction cycle Clock speed, cores, cache Logic gates Logic circuits	**Systems Architecture** CPU: Instruction cycle, performance CPU components and their function using LMC Embedded systems Memory: RAM, ROM, virtual memory Flash memory Storage: Magnetic, optical, solid state, justifying choices	(Programming Theory)	*The characteristics of contemporary processors, input, output and storage devices*
	design, write and debug programs that accomplish specific goals use sequence, selection, and repetition in programs use logical reasoning to explain how some simple algorithms work	**Programming** Lyrics & Chatbot Algorithms Sequence Selection Computational Thinking Quizzes Fruit machine Sequence Selection Iteration Modules Data structures (lists & dictionaries)	**Efficient Programming** Parking meter software Sequence, selection. iteration Modules (time, random, turtle) Procedures Capital cities quiz String manipulation Buffer: functions	**Efficient Programming** Quiz Algorithms - flowcharts & pseudocode Exception handling String manipulation Procedures Functions	**Algorithms & Programming Techniques** Computational thinking Searching algorithms sorting algorithms Pseudocode & flowcharts OCR/GSA Spring manipulation Arrays and 2D arrays Combining data types	**Programming Theory** Defensive design Maintainability Testing Identifying syntax & logic errors Selecting & using suitable test data Practical: Exponentiation, MOD, DIV Different languages Translators Assembler, compiler & interpreter Tools & facilities of an IDE	*Elements of computational thinking Problem solving and programming Algorithms to solve problems and standard algorithms*
		Memory & Data Representation Input Output Memory: RAM/ROM Binary representation of number, characters & images Units Hexadecimal	**Spreadsheets** Basic formula Functions Graphs & charts If statements Graphic design with sources table	**Spreadsheet Modelling** Formula, IF, functions 3D referencing Conditional formatting Goal seek VLOOKUP Graphic design with sources table	**SQL** Creating a table Querying a table Advance queries using logical operators	**Data Representation** Revision Units, numbers Character Images Sound Compression System security Attack & threats Vulnerability	*Exchanging data Data types, data structures and algorithms*
Information Technology	*select, use and combine a variety of software (including internet services) on a range of digital devices understand computer networks including the internet*	**ICT Basics** Admin (usernames, passwords) Key hardware (mouse, keyboard, monitor) & troubleshooting Common software Operating systems & files Word processing Spreadsheets Presentation software TinkerCAD	**Networks** LAN vs WAN LAN hardware Factors affecting performance Star & mesh topologies Wi-Fi: frequency, channels, encryption The internet: DNS, hosting, the cloud	**Cyber Security** Malware Bloatware Viruses & trojans Spam, phishing, RATS Skimming Sources table	**Wired & wireless networks & topologies** LAN v WAN Hardware: WAPS, routers, switches, NICS, transmission media Factors affecting performance Client server, p2p Virtual networks Star & mesh Wi-Fi IP/MAX addressing and protocols Network layers Packet switching System security	(Data representation)	*Software and software development*
		CAD/CAM Basic design Avatar Tinker CAD	**Building a webpage** My favourite book webpage HTML tags Images Embedding content CSS	**Graphics** Logo branding Photo editing Magazine graphic design	(GCSE Graphics)	(GCSE Graphics)	(Level3 Graphics)
Digital Literacy	*use search technologies effectively use technology safely, respectfully and responsibly*	**e-safety** Online safety Sexting Digital citizenship Digital identity	**Internet Research** Sources Date checking Falso news Social media	**Ethical, Legal, Cultural & Environmental Concerns in Computing** Case studies iPhone vs FBI (privacy) Intel (Green) vs Google (server farms) Wikileaks Apple vs Microsoft and the xerox debate Samsung vs Apple Technology addiction Landfill & waste Job creation vs automation Users with specific needs Sampling in music Facebook and its use of data	**Systems Software** Purpose & functionality Operating systems Utility system software Open source vs proprietary Legislation Data Protection Act Computer Misuse Act Copyright, design and patents Act Creative Commons Licensing Freedom of Information Act	(Data representation)	*Legal, moral, cultural and ethical issues*