Computing Progression Document

The Glapton Academy
A L.E.A.D. Academy

Please refer to iCompute scheme for subject knowledge and lesson plans for KS1 and KS2.

1 hour of Computing time a week. Up to 6 lessons in a module. Please use allocated laptop/iPad timetable to deliver these lessons.

Concept	F1	F2
Technology in our lives	I can tell you about technology that is used at home and in school. I can use simple equipment such as electronic toys. I can turn on an electronic device such as a TV using a remote.	I can use a safe part of the internet to play and learn. I can tell you about different kinds of information such as pictures, video, text and sounds.
Multimedia	I can take a picture with a camera. I can watch a video of myself trying something new.	I can use shapes and text on a screen. I can change the colour of something on a screen. I can use technology to show my learning.
Programming	I can make a floor robot move (Beebot). I can use simple software to make something happen.	I can make choices about the buttons and icons I press, touch or click on. I can navigate a floor robot around an object.
E-Safety	I can ask and adult to use the internet. I can tell an adult when something worrying or unexpected happens while using the internet.	I can be kind to my friends when using technology. I can talk about the amount of time I spend using a computer/tablet/gaming device. I am careful with technology devices.
Vocabulary	TV, remote, radio, music player, Alexa, toys, electricity, lights, games, camera, safe, worries, surprising, Beebot, robot, move, arrows, drawing, paint.	Online, internet, computer, tablet, games console, video, picture, text, sounds, information, shapes, circle, square, buttons, Beebot, forward, backwards, sideways.

NC Links	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Concept: Computer Science	**iProgram** I can understand what algorithms are, how they are used as programs. I can recognise common uses of information technology beyond school. I can understand that programs execute by following precise instructions. I can use logical reasoning to predict the behaviour of simple programs. I can create and debug simple programs. I can use technology purposefully to create, organise, store, change and retrieve digital content. **iAlgorithm** I can understand that algorithms are precise instructions that can be followed. I can follow and devise a simple algorithm. I can understand that programs execute by following precise instructions. I can plan, test and debug a simple algorithm.	**iProgram** I can understand that an algorithm is a process that consists of a series of steps to achieve a goal. I know that algorithms can describe everyday activities and can be followed by humans and computers. I know that algorithms are made up of steps. I know that steps can be repeated. I know that computers need more precise instructions than humans do. I can use digital drawing tools (Scratch) to create images. I can program a simple animation involving movement. I can write a simple program that produces an output (text) I can combine images and text to create a simple animation.	**iProgram Unit 1** I know that a program is a sequence of statements written in a programming language (scratch). I can program an animation that executes a sequence of statements. I know that computer programs containing graphics use x y coordinates and turns are measured in degrees. I can program a sequence of instructions that create visuals effects. I know that algorithms and programs can involve repetition. I can predict the outcome of a simple algorithm. I can use the repeat function to draw 2D shape. I can import and combine images to create personal animations. **Unit 2**	**iProgram Unit 1** I can understand that a program is a sequence of statements written in a programming language. I can program a turtle to execute a sequence of statements. I know that statements can be altered. I can amend and algorithm to change the size of a shape. I can program a virtual robot to move and draw. I can design a program to make choices using commands and actions. I can develop algorithms using repetition. **iProgram Unit 2** I know that robots have moving parts and can be programmed to follow instructions. I know that sequences of commands can be replaced with repeats. I know that robots can be programmed to respond to sensory data. **iProgram Unit 3** I can plan and develop algorithms and programs. I know what an abstraction is.	**iProgram Unit 1** I know that computer programs using graphics use x y coordinates. I can use conditional (if) statements. I can understand what a variable is and why they are useful. I know that variables can only be true or false. I can explain what variables can be used in programming to keep track of values. I can program statements that make something happen in the value of a variable. I can develop an outline of tasks and activities required to develop a project. I can use the computational concepts of sequence, selection, repetition and variables to program a computer game. I can develop strategies for debugging computer programs. **iProgram Unit 2** I know how to create a world and control a character using the	**iProgram Unit 1** I can understand the difference between simulations and games. I can program a computer game by sequencing conditional statements. I can program an algorithm according to a plan. I can develop strategies for debugging computer programs. **iProgram Unit 2** I can program simple instructions. I can use procedures to move objects on screen. I can use conditional statements and variables in a computer program. I can devise, plan, develop and debug an animation. **iApp Unit 1** I understand the value of mobile technology and its future development. I know that apps are developed according to a plan. I can use development tools to create an app with a purpose.

	I can make predictions about an outcome based on a simple algorithm. I can understand conditions or outcomes. I can understand that some statements can only be true or false		I know that physical devices can be programmed. I know that computer instructions can be followed by a robot. I can use sequence and repetition. I understand that behaviour can be programmed to respond to data from sensors. I know that objects in the real world move using gears. **iSimulate** I can explore the effect of changing variables in a simulation using them to make and test predictions. I know that computer simulations are guided by rules. **iConnect** I know that the internet is many computers that are connected. I know what services the internet provides.	**iAlgorithm (moved from year 3)** I know the best method of sorting a group of unknown weights into order. To understand that information is easier to find in a sorted order. I know that splitting problems up and solving parts at the same time can speed up finding a solution. I know that algorithms are a set of instructions that complete a task. I know that computers work by following a set of instructions – called a program.	Kodu programming environment. I can use conditional statements such as when and do. I can program an object to move towards another by sequencing statements. I can amend a computer program to accept user input. I can program objects to move along paths. I know how to create 'levels' in a game. I know that computer programs require a design before creation. I can program a computer game using a design and a plan as a basis. **iAlgorithm** I know that a linear sear involves checking information one by one. I know that networks connect a group of things (systems). I can avoid network deadlock in a group. **iCrypto** I know that messages can be sent and received secretly using encryption.	I know that procedures are a sequence of statements that can be called repeatedly using only one command. I can create an app that used variables and procedures. I can develop strategies for testing and debugging computer programs. **iApp unit 2** I can explore event-driven programming using a text-based programming language (Bitsbox). I know the importance of decomposition. I know that variables contain values. I can use algorithms to develop a solution to a problem and translate it into code. **iNetwork** I know that computer networks are a group of connected computers that allow users to communicate and share. I know that the router sends/receives information as packets of data. I know that every computer in the world has an IP address that can be traced back to a webserver. I understand how internet search engines work.

					I can understand decrypt signalling messages. I can decode data transmitted through Morse code. I can encode/decode messages using a simple shift cipher. I can use frequency analysis to decipher encrypted text. I know the importance of cryptography historically, including the Enigma Machine.	I can use basic HTML syntax in a webpage.
Vocabulary	Device, signal, instruction, response, forward, back, left, steps, program, input, output, debugging, command Instructions, sequence, forward, back, turn, up, down, algorithm, left, right, debug, predict, pattern, repeat, sequence, true, false	Algorithm, instructions, sequence, input, output, order, repeat, back, left, right, forward, cut, paste, redo, undo, sprite, copy, statement, negative, steps, duplicate, wait.	Sprite, blocks, programming, coordinates, up, down, right, left, if (conditional statement), x, y, axis, sequence animate, loop, repeat, import, record Simulation, choice, rules, variables, model, pattern, adventure, choices, predict, real life, design, effect, variables. Order, compare, measure, sort, select, greater than, less than, left, right, algorithm, instruction, program.	Sprite, blocks, programming, coordinates, up, down, right, left, if (conditional statement), x, y, axis, sequence animate, loop, repeat, import, record, condition, robot, execute, if, then, else, true, false,	Sprite, up, down, left, right, xy coordinates, condition, if, boolean, true, false, variable, sense, change, type, string, number, store, memory. Greater than, less than, equal to, linear, search, algorithm, network, connect, route, strategy, cooperation, algorithm, direction, navigate. Cipher, code, encrypt, decrypt, cryptography, key, signalling, semaphore, down, low, out, high, up, across, data, binary, dots, dashes, mores, dit, dah, on, off.	Control, output, simulation, process, condition, statement, if, then, design, plan, logical operators, variables, greater than, less than, equal to, sprite, algorithm, iteration, repeat, forever, while, test, bug, amend, systematically, Mobile, input, output, tablets, apps, component's, events, properties, android, iOS, operating system, hardware, software, handler, coordinates, procedure function, type, call, argument. Mobile, input, output, tablets, apps, component's, events, properties, android, iOS, operating system, hardware, software,

			Network, world wide web, email, communicate, connected, home, router, data, images, text, video, hyperlinks, browser, surfing, homepage, refresh, address bar, url, icon, search engine		Internet, world wide web, email, instant messaging, skype, facetime, HTM code, hacking, remis, webpage, copyright, hyperlink, syntax, url, element. CSS.	handler, coordinates, procedure function, type, call, argument. Network, internet, wired, wireless, data, devices, communicate, connected, LAN, WAN, network, switch, router, packet, data, IP address, url, trace, webserver, ISP, search engine, index, ranking, spider, crawling, algorithm, tags, HTML, CSS, URL, copyright.
Concept: Digital Literacy	**iModel** I can understand that a computer can be used to model and environment where choices can be made. I can understand that a computer model is not exactly the same as real life. I can create a representation of a real or fantasy game or story. I can understand that computers can show real events and things. I can use a mouse to move things accurately on screen. I can understand that computers can be used to make choices.	**iAnimate** I know what a stop-frame animation is. I know that an animation consists of characters, a stage, props, sound, text and a story. I can create my own storyboard. I know that animations need to be scripted. I can create a stop frame animation. **iPub** I know about the world wide web and how it has developed throughout time I can consider how technology changes with time. **iBlog** I know what a blog is and how it can be used	**iSimulate** I know that computer simulations can represent real or imaginary situations. I understand that simulations can help people try and understand things. I can design and produce a computer simulation or adventure game. **IPodcast (new)** I know how sound is used and stored with technology. I know how sound is used in a podcast. I can use digital tools to record and edit sound. I can add sound effects to a recording.	**iAnimate** I can identify what an animation is. I can create a scene for an animation I can understand that animations can be created using digital tools. I can create an animated short story using a storyboard. **iMail** I know that messages can be used to communicate over a distance. I know how email travels and how to retrieve it. I can send and reply to emails. I can attach a file to an email.	**iWeb** I can explain the world wide web. I know that information can be edited and changed on the web. I understand that webpages are structured by HTML code. I can change an image on a webpage. I can read basic HTML code. I can use research and upload an image for insertion to a website	

		I know how to respond to the writing of others. I can post on a blog. I can use a blog to demonstrate and share learning. I can reflect on work and make improvements. **<u>iDo Email</u>** I know that message can be sent electronically over distances. I know that people can reply to messages. I know that communication ca be images, sound and text. **<u>iSearch</u>** I know that the world wide web contains large amounts of information. I can use links to navigate to a website. I know that the internet can be used to answer questions. I can navigate using hyperlinks. I can locate specific information on a website. I can collect information from different online	**<u>iConnect</u>** I can move around the internet using basic navigation skills including hyperlinks. I know the main features of web browsers. I know how to use and find information on a search engine. I know that not all information on the web is reliable. I know that copyright is an author's right of ownership and it is illegal to steal other people's material			

		sources and check that they are the same.				
Vocabulary	Survey, tally, information, data, pictogram, graph, select, click, classify. Return, backspace, spacebar, scroll, text, keyboard, shift, printer, open, save, cut, font. Mouse, point, click, drag, choice, decision, adventure, imaginary, model.	Stop motion, image, animation, movie, character, flip book, background, stage, sound, audio, text, storyboard, script, props, setting. Past, present, future, similar, different, input, devices, microchip, computer, storage, keyboard, internet, world wide web, email, ebook, audio, images, text, links. Blog, online, website, text, webpage, hyperlink, login, password, communicating, comment, response, justify, evidence, evaluate. Browsing, internet, navigate, web page, hyperlink, solve, clue, scroll	Simulation, choice, rules, variables, model, pattern, adventure, choices, predict, real life, design, effect, variables.	Image, camera, animation, stop, motion, illusion, onion, skin, effects, onion skinning, frame rate, FPS, CGI, GIF, 3D, design, plan, animate, test, debug. Message, privacy, security, email, send, receive, inbox, log out, server, address, attachment, forward, reply.		Spreadsheet, cells, cell reference, problems, solve, formula, sum, formula bar, cell, calculate, chart, graph, formulae, SUM, modelling, variables,
Concept: Information Technology	**<u>iWrite</u>** I can recognise that text can be created in a number of ways. I can use word processing software to create a text.	**<u>iPub</u>** I can share knowledge through media presentations. I can plan/produce a presentation of research findings. I can create an interactive book.	**<u>iData</u>** I know how information in a database is organised. I can identify the advantages of a computer database over a paper one.	**<u>iData</u>** I know that computers represent data as numbers and count using switches of 'on' and 'off' (0 and 1). I can understand the information that can be stored as numbers, text and choices.		**<u>iData</u>** I can store numerical values in spreadsheets (cells). I can enter formulae to calculate totals. I know that graphs and charts can be created and changed easily through spreadsheet input.

	To understand that a compute can be connected to a printer. I can insert text into a word processing application. I can open and save a word document. I can understand the value of using a word processor to produce text. **<u>iData</u>** I can understand why pictograms are useful. I can collect and organise information to solve a problem. I can create a pictogram using collected data. I can sort information and present data using a graph.		To find and enter information to create additional records in the database.	I can search a database for answers. I can create a simple chart		I know that the SUM function can be used to create formulas. I can use a spreadsheet to model a costing exercise
Key Words	Survey, tally, information, data, pictogram, graph, select, click, classify. Return, backspace, spacebar, scroll, text, keyboard, shift, printer, open, save, cut, font. Mouse, point, click, drag, choice, decision, adventure, imaginary, model.			Binary, series, base, on, off, data, digital. Record, field, file, database, search, chart.		
Concept: E-Safety	E-Safety Progression Document	E-Safety Progression Document	E-Safety Progression Document	E-Safety Progression Document	E-Safety Progression Document	E-Safety Progression Document