DENHAM GREEN E-ACT PRIMARY ACADEMY

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Create	*To understand that digital texts can include words, numbers, graphics, film and sound.* *To know how we input into a computer.* *To understand the difference between computer hardware and software.* *To understand that computer systems enable us to store digital content. Start to organise their work into pre-prepared folders.* *To know that computer software can help us with our reading and writing.* *To understand that we use computer software to create digital content.* *To understand that we can choose from different software to create digital drawing or painting. Suggest a program to use based on its tools/features* *To know that we can use logical reasoning to predict the behaviour of simple programs.* *To identify and use a range of range of technology to capture still and moving images. Begin to talk about how such devices operate.* *To recognise the need to ask permission before taking anyone's photograph. Seek to keep a record of their work.* *To understand that images can be accessed from many sources. Recognise that not all images found might be appropriate.* *To understand that audio devices can capture and/or playback sound and that they help us communicate with others.* *To know that sounds add meaning to digital texts.*	*To understand that elements in digital content contribute meaning or create atmosphere.* *To review what a computer input device is.* *To review the differences between hardware and software.* *To understand that computer systems enable us to store digital content in precise locations.* *To investigate ways in which software supports writing. Select a specific application for writing based on its tools.* *To recognise how digital imaging is used in and beyond school.* *To explore differences between digital and non-digital images.* *To know that digital devices need precise commands in "their language" to perform a specific task.* *To select appropriate devices to capture images clearly and in frame, seeking consent before taking/using someone's image.* *To understand digital images can be stored in electronic collections and searched using key words and menus or categories.* *To understand that images can be sequenced to tell a story or describe an event or process.* *To understand objects can animated in digital content.*		*To understand that computer systems store data as bytes and we use this unit to specify size.* *To understand that computer networks have a structure which we can use to save and share digital resources.* *To understand that we can store data on computers in remote locations, which we can refer to as the cloud. To understand that there are different operating systems used by our computing devices. Compare two operating systems noting their difference and similarities.* *To understand word processing software often includes digital tools to improve clarity, accuracy and efficiency.* *To understand that digital objects can be inserted and controlled in word-based texts.* *To explore how images can rapidly increase document size.* *To understand that multimedia texts are effective in communicating ideas to specific audiences.* *To know that non-linear multimedia texts can be organised to include audience control over how the content is accessed. Use safe web tools to design an online multimedia text.*	*To understand digital sound has an important role to play in building atmosphere, presenting ideas and influencing audience mood.* *To investigate the history of sound recording and understand how the technology has developed.* *To understand that sound-editing and music creation software enables us to create, record and adapt sounds.* *To understand that sound recordings or broadcasts should be planned to improve their impact.* *To understand that there are complex rules around copyright, ownership and plagiarism which we should observe.* *To understand that there are different types of sound files which computers and digital devices can handle.* *To understand that sound recordings can be exported and used in other applications.* *To understand how sound files can be shared over the internet, and to consider the eSafety and copyright implications of doing this.* *To understand simple sound and music compositions can be programmed*	*To understand 3D graphical modelling enables us to explore objects that may not exist, or could be difficult to observe in other ways. To understand that digital graphical tools can support the creation of models, enabling them to be explored and developed in 3D. Use tools in the software to create a "fly-through" to support others in viewing the model. To understand that every computer needs an operating system to manage a wide range of processes. To analyse/evaluate digital films and animations, considering how they are used to inform, persuade and entertain audiences. To understand film/animation can be stored, shared and published locally and online, but that this sharing may not be appropriate. To understand the stages in producing a live film and/or animation. The live filming could include green screen filming. To understand the need to test and review their work with an audience. To develop ways to use animation to meet specific audience needs.*

Digital Research		*To know that information can come from many different sources, including digital and non-digital.*		*To understand the internet is a global system of linked computer networks hosting many services.*	*To investigate how "big data" is used in our world.*	
		To understand that the World Wide Web holds huge amounts of information and each website has a unique name and address.		*To know identifying key words is central to research. Write their own version of the text.*	*To understand file extensions can identify software used to create a file, but files may be accessed/edited using other software.*	
		To understand that websites and other digital resources provide tools which we can use to locate information.		*To know the World Wide Web is an internet service accessed by web browsers and searched using search engines.*	*To understand computers store/process data as 0s and 1s, known as binary form. Add two binary numbers.*	
		To understand that selecting appropriate keywords is essential in finding specific information.		*To understand that search engines locate information on the World Wide Web rapidly, but rank it when providing results*	*To have a broad understanding of the school's computer network and the role of the server/master computer.*	
		To know that anyone can put information on the World Wide Web and that it may not be true. Combine information from different sources.		*To understand that digital searches results can be inaccurate, biased, unsafe, irrelevant and may differ from one search engine to another. Use more than one search engine, comparing results.*	*To understand network devices can be identified by IP address.*	
		To understand that we can use digital resources to help us share the results of information research.		*To understand the malware and computer viruses are programs which can harm your device or steal your information.*	*To understand that we can use tools to improve the accuracy and efficiency of our digital searching.*	
		To understand that we organise ideas and information using mind maps.		*To understand works are the creator's own intellectual property.*	*To understand that internet activity can leave a permanent trail.*	
		To understand that we can organise objects according to their properties or characteristics.		*To understand electronic data is held about us on the internet.*	*To understand that databases provide a way to store, organise, retrieve and analyse sets of data.*	
		To understand that they own the materials they create and that others should ask permission before using them		*To understand that spreadsheets have a specific structure which enables us to locate and enter data and create tables and graphs.*	*To understand database structure determines the queries it can answer.*	
				To understand spreadsheets allow us to explore number and number patterns	*To understand the stages in database development.*	

Information	*To understand that information exists in many different forms. To understand that information in graphs can be simpler to understand than written text. To understand that the tools within graphing software can be used to present detailed information clearly. Include labels on axes. To understand that mistakes are easy to make when gathering and recording information. To understand that technology can sense conditions around us. To understand technology can record changes in conditions around us and we can use this to make general statements. Consider why the data-logger uses a continuous line to show the results. To understand objects can be sorted according to a property. To understand that yes/no questions can provide useful information and can help us make decisions. To understand that branching databases can be used to organise objects and to identify them using yes/no questions. To understand computers use repeated processes to sort objects.*		*To know the difference between data and information. To understand that data-loggers and sensors show and record changes in environmental conditions. To understand that data-loggers and sensors and the related software can support analysis of environmental data. To understand that digital tools such as microscopes and cameras can support investigational work. Combine data from data-loggers and microscopes/cameras to support their investigations. To understand that selection is used in branching databases to sort and classify objects based on their characteristics. To develop high-level questioning based on the key characteristics of objects. To understand flat-file databases are structured into files, records and fields and that this supports organisation and searching. To understand that using electronic databases can improve efficiency in organising information. To know database records can be sorted to answer questions. To understand that using electronic databases can improve efficiency in searching for information. To understand database fields can be defined as different types, which can supports accurate data entry and effective*			*To understand that the spreadsheet structure enables us locate and change specific cells or ranges. To understand that spreadsheets have a range of editing tools to support appearance and clarity. To understand that spreadsheet calculation tools allow numbers and cell references to be used within formulae. To understand that spreadsheet functions enable calculations to be carried out on ranges of numbers. To understand spreadsheet functions help us analyse large data sets. To identify opportunities for investigations involving data-loggers/sensors, and understand spreadsheet functions help us analyse data sets. To understand that the cells in a spreadsheet can be set up to change depending on the value being input. Develop to include the use of =IF() statements. To understand that tools can be designed using spreadsheet software to support different users' needs. To understand that spreadsheet models allow us to explore different situations in the wider world. To understand that using graphs within spreadsheets can support prediction and 'what if 'questions.*

			querying. *To understand the need for accuracy when creating databases.*			
Digital Communication		*To investigate how methods for sending messages have developed over time.* *To understand some of the ways we send messages today.* *To consider the wording and the language we use to send formal and informal messages.* *To understand email is a digital tool to send messages.* *To understand that messages can be left in online spaces for others to pick up when they are ready.* *To understand the importance of staying safe online and keeping personal information private.* *To discuss how they use technology in school and at home to communicate safely.* *To know that virtual worlds include activities or games designed by computer programmers to help us play and learn.* *To understand that we can control outcomes in a game or simulation. Suggest commands which the program might be following.* *To understand that algorithms are used to plan and test computer simulations and games before they are programmed.* *To understand that onscreen characters can be programmed*	*To understand that we need to use electronic communication technologies appropriately to keep ourselves and others safe.* *To understand digital communications devices connect using a network, enabling us to send messages and share materials.* *To understand that the system we use when we send emails has similarities to the one used for physical letters.* *To understand the internet is a network providing communication tools, which we must use safely, responsibly and respectfully.* *To use an online environment safely and appropriately to collaborate.* *To understand that sound can be recorded and manipulated to communicate meaning and/or atmosphere. To understand we can use sound-editing software to capture, import and manipulate sounds. . Explore how sounds can be faded in and out.* *To understand how we can use software to organise/modify sounds.*			*To understand the need to develop safe, respectful, responsible use of online technologies.* *To consider what 'personal information' is and why we should be protective of this information when online.* *To know that most modern communication devices can provide details of our location.* *To understand a blog is an online space, with regular personal entries, on which readers may be able to comment.* *To understand blogs can support learning and sharing; they may include a range of different media.* *To understand a micro-blog is designed to enable users to share short status updates with a limited numbers of characters.* *To understand there are complex copyright rules for resources.* *To understand a wiki is a tool for organising and sharing collaborative information.* *To know information can vary in accuracy, bias and viewpoint and may be unhelpful, irrelevant or misleading*

		to move or respond in a specific way.				
E-Worlds	*To begin to understand what a computer is and how it operates. To understand that we use many programmable and automated devices at school, home and in the wider world. To understand that natural systems (for example plants) have inputs and outputs and this can help us predict how they will behave. To understand that an algorithm is a set of precise instructions or rules to carry out a specific task or solve a problem. Suggest suitable tasks for new algorithms. To understand we use logical reasoning help create algorithms. To understand computers use programs written in programming languages and that there are many such languages. Create their own language for a task. To understand digital devices are controlled using programs written in specific programming*		*To understand that digital images can be changed and edited and that this can have an impact on how we think and feel. To understand that most digital images are made up of dots called pixels and that the denser the pixels, the higher quality the image. To understand computers have internal components to support different processing tasks. To understand digital image editing software is made up of programs that instruct a computer to carry out specific tasks related to adapting images. Explore image resizing to decide the best size for screen projection To understand the need to seek consent before capturing and/or using the images of others. To understand that some digital images may not be appropriate and know what to do if such materials are accessed. To understand that the appearance of movement can be created in inanimate objects*	*To understand a simulation is a digital system with specific rules, providing an environment often mimicking real world situations. To understand abstraction leaves out unnecessary detail and is helpful when designing a process. Begin to see that abstraction can help us identify similarities between processes.⬜ To understand simulations are programmed to allow choices by the user to change the outcomes. To understand we can use algorithms to design the steps of a process before writing computer programs. To understand a program is a sequence written in a programming language and designed to perform a specific task. To know problems can be solved efficiently using decomposition and that this is central to good programming practice. To understand program commands can be saved as a procedure and procedures can be called by programs and procedures. To develop*	*To identify automatic control systems, understanding that many have sensors and can respond to changes in conditions around them. To understand that we use abstraction to help us understand natural systems. To review the need for efficient program design. To understand that a variable is used in computer programming to store and retrieve data when the program is run. Use more than one variable in a procedure, for example write a procedure to draw any polygon in Logo. To understand programs can control computer screen displays. Write programs that control pen width/colour and co-ordinate this with the screen background – as for example in a screensaver. To use sequence, selection, repetition and variables in programming an onscreen game or activity. Program a physical device using Scratch. To understand adding comments to programs aids understanding and supports*	

	languages. *To understand precision and sequence are key to programming.* *To know the repeat command can make programs more efficient.* *To know collaborative exploration can support efficient programming.*		*using stop-motion animation.* *To understand animation can be used to convey a message/idea.* *To know animation software includes a range of different features and tools.* *To understand the importance of planning an animation project.* *To know we can animate objects using a precise sequence of steps.* *To know that an algorithm can be used to support us in writing a related computer program.* *To know that a program can be used to control the behaviour and appearance of different onscreen objects*	*independent programming capability. To understand selection is a programming process, which uses a yes/no question to provide alternative routes through a program. To understand natural systems may follow processes involving selection. To be aware that online simulations may include chat facilities and to know how to stay safe around these.*	*future development. To know that programs can be written to make physical automatic control systems respond to inputs from sensors. To know we can review and refine programs to improve them.*	
Vocabulary	*Digital, hardware and software, input, word processor, computer, visualiser, webcam, microscope smartphone, graphics,* *logical reasoning, algorithm.* *pictogram, bar chart line graph, sensor, algorithm, repetition, branching database, data-logger, unplugged, webcam, microscope, smartphone etc.* *keyboard, monitor, base unit, speakers etc. programmable device, program, debug, refine, predict, repeat (repetition,) precision, sequence, decompose*	*digital, non-digital, animation, Input and output, hardware and software debug, refine,* *Word processing terms: font bold, italic, highlight etc.* *website, World Wide Web, hyperlink, hotspot, credit, pictogram, keyword, organise, group or sort objects, table, mind map, Venn Diagram, Carroll Diagram, bar chart* *Main parts of a computer, peripheral, blog, forum, avatar, algorithm, simulation, logical reasoning, pattern, predict*	*data and information data-logger, sensor, selection, branching database, flat-file database, database terms: file, record, field, field content pixels, brightness, contrast, tinker, copyright, component, computer processor, saturation, stop-motion animation, storyboard, algorithm, zoetrope, CPU, Email, server, blog, online discussion forum, common file types and extensions*	*Internet ,world wide web, URL, hyperlink, browser, search engine, intellectual property, copyright, spreadsheet, formula, virus, malware, Creative Commons* *simulation, logical reasoning, algorithm, abstraction, selection, program (noun and verb), refine, procedure, tinkering multimedia, hotspots hyperlinks, digital operating systems, GUI (pronounced 'gooey'), Cloud, copyright*	*Big data, common file types, Encryption server and client, web crawler, digital footprint/tattoo, database, (database) fields, records, common file types decomposition,* *algorithm, variable (in programming), constant, abstraction, pseudocode, program (noun and verb), procedure, sensor, input, output dynamics, pitch, tempo, timbre, looping (sounds) multi-track, podcast, plagiarism, copyright*	*wiki, blog, micro-blog, data protection, intellectual property, copyright, GPS, creative commons, common file types Spreadsheet, cells, columns and rows, cell reference (spreadsheet) formula, (spreadsheet) function Selection (in programming) Variables (in spreadsheets) storyboard,* *(video) transition,* *(video) trimming, operating system, Graphical user Interface, (GUI, pronounced 'gooey') Windows,* *DOS (Disk Operating System) common file types, copyright, plagiarism*