BLACK PEAR TRUST – SUBJECT PLAN - COMPUTING

Purpose of Study

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

The national curriculum for computing aims to ensure that all pupils:

♣ can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
♣ can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
♣ can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
♣ are responsible, competent, confident and creative users of information and communication technology.

Key Stage 1 content: Pupils should be taught to:

♣ 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 logical reasoning to predict the behaviour of simple programs
♣ use technology purposefully to create, organise, store, manipulate and retrieve digital content
♣ recognise common uses of information technology beyond school
♣ 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 the internet or other online technologies.

Key Stage 2 content: Pupils should be taught to:

♣ 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
♣ 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
♣ 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 technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

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To be working at '**EXPECTED**' in computing children can…

ELG	Year 1:	Year 2:
• They put two instructions together to control a programmable toy • Children recognise that a range of technology is used in places such as homes and schools. • They select and use technology and particular purposes.	**ALGORITHMS AND PROGRAMS** • create a simple series of instructions - left and right • record their routes • understand forwards, backwards, up & down • begin to plan and test a journey **DATA RETRIEVING AND ORGANISING** • capture images with a camera/ipad • print out a photograph from a camera/ipad with help • record a sound and play it back • enter information into a template to make a graph • talk about the results shown on a graph **COMMUNICATING** • recognise what an email address looks like • join in sending a class email • use the @ key and type an email address • word process ideas using a keyboard • use the spacebar, back space, enter, shift and arrow keys **E-SAFETY** • they understand the different methods of communication (e.g. email) • know you should only open email from a known source • know that websites sometimes include pop-ups that take them away from the main site • know that personal information should not be shared online • know they must tell a trusted adult immediately if anyone tries to meet them via the internet • follow the school's safer internet rules • act if they find something inappropriate	**ALGORITHMS AND PROGRAMS** • use right angle turns • use the repeat commands • test and amend a set of instructions • write a simple program and test it • predict what the outcome of a simple program will be **DATA RETRIEVING AND ORGANISING** • find information on a website • click links in a website • experiment with text, pictures and animation to make a simple slide show • use the shape tools to draw **COMMUNICATING** • send and reply to messages sent by a safe email partner (within school) • word process a piece of text • insert/delete a word using the mousepad, delete/backspace or arrow keys • highlight text to change its format (B, U, *I*) **E-SAFETY** • know the difference between email and communication systems such as blogs • know that bookmarking is a way to find safe sites again quickly • begin to evaluate websites and know that everything on the internet is not true • know that it is not always possible to copy some text and pictures from the internet • recognise advertising on websites and learn to ignore it • use the internet for learning and communicating with others, making choices and navigating through sites • use a password to access a secure network

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To be working at '**GREATER DEPTH**' in computing children can…

ELG	Year 1:	Year 2:
• Children find out about and use a range of everyday technology. They select appropriate applications and support an identified need	• record pupil's voices as a voice over • create a simple slideshow of photos • print out a page from the internet	• predict the outcomes of a set of instructions • create a presentation in a small group and record the narration • record sounds into software and playback • insert pre-recorded sounds into a presentation • capture still and moving images

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EYFS	Year 1	Year 2
Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions Year 1 – Units 1.2, 1.4, 1.5, 1.7 Year 2 – Unit 2.1 Create and debug simple programs Year 1 – Units 1.5 and 1.7 Year 2 – Unit 2.1 Use logical reasoning to predict the behaviour of simple programs		
• Explore remote control toys and devices • Explore outcomes when individual or combinations of buttons are pressed on a programmable toy/floor robot	• I begin to understand that an algorithm is a set of instructions or clear steps to solve a problem (for example: forward, backwards, up and down) • With support I can explain and predict actions • With support I create /follow instructions (algorithms) to navigate other children and programmable toys around a course • With support I create instructions (an algorithm) to draw a simple shape or move a sprite across the screen • I talk about devices in the home that are controlled by commands (algorithms and programs)	• I understand that an algorithm is a set of unambiguous commands or instructions or clear steps to solve a problem • I create /follow instructions (algorithms) to navigate other children and programmable toys around a course • I create instructions (an algorithm) to draw a simple shape or move a sprite across the screen • Sequence a series of instructions (algorithms) to create a larger program e.g. BeeBot travels in different directions round a map to find the treasure without stopping • Use logical reasoning to 'tell the story' of what is happening and predict behaviour when controlling devices (actual or on screen) estimating distances and turns • I can test and amend a set of instructions • I estimate and debug a simple program – make sure things work, find and fix any mistakes • I understand that trial and error and prediction are important skills when controlling devices to achieve a specific outcome

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Use technology purposefully to create, organise, store, manipulate and retrieve digital content Year 1 – Units 1.2, 1.3, 1.6, 1.7 and 1.8 Year 2 – Units 2.3, 2.4, 2.5, 2.6, 2.7, 2.8		
•	**Electronic data**: • I understand that ICT can be used to sort items and information • I understand and describe how ICT makes it quick and easy to add to and change data • I begin to develop simple classification skills by carrying out simple sorting activities (starting away from the computer) • I use simple graphing programs to produce pictograms and other simple graphs	**Electronic data**: • I begin to understand that if data has not been entered accurately it cannot be used to provide correct answers to questions • I am aware that digital devices (such as thermometers and microphones) can make it easy and more efficient when recording data • I use simple search tools in a prepared database to answer simple questions (e.g. how many children have brown hair) • I use branching databases sort and classify a group of items by asking simple yes / no questions • I am able to store and retrieve my work, including other digital content, between computer and network and equivalent cloud-based storage
•	**Sound and music**: • I understand that devices have stop, record and playback functions • I recognise that an electronic keyboard can be used to select and control sounds • I explore a range of electronic music and sound devices including keyboards, apps, software and different peripherals • I use software to explore sound and musical phrases for a purpose • I experiment with creating and recording sound with support	**Sound and music**: • Record and playback sounds (e.g. voices, instruments, sounds around them …) at or away from the computer • I begin to compose music using icons to represent musical phrases
•	**Digital images**: • I understand there is a variety of tools in a graphics package and they each have a different purpose • I understand that many devices, such as digital still or video cameras, visualisers and scanners, can capture and store an image.	**Digital images**: • I understand that some packages will enable images to be animated. • I understand that animation is a sequence of still images • I talk about my use of a paint package and my choice of tools • I talk about the differences between a graphics package and paper based art

	• I understand the need to frame an image or scene and keep the camera/ipad still to capture a good still image • I use a paint package to create a picture to communicate my ideas • I use tools, create lines and textures and use the flood fill spray and stamp tools • I use a digital camera/ipad or camcorder to take a picture or record my work	activities (undo, changes quickly and easily made) • I begin to discuss the quality of their image and make decisions as I work (e.g delete a blurred image) • I develop a variety of skills using a range of online and electronic tools and techniques to communicate a specific idea or artistic style / effect • I develop greater control over the features available on a digital stills or video camera • I begin to edit digital photographs
• I know how to use a keyboard to type up text	**Text and multimedia**: • I know that text comes in different colours, sizes and styles • I am beginning to learn how to save my work and retrieve it • When using tablets or other electronic devices I know familiar icons to save, delete or print work • Develop familiarity and correct use of the keyboard – spacebar, backspace, shift for capital letters or caps lock), enter etc • I can use a mouse to move and place items accurately on a screen • I can add appropriate images • I word process short texts using the enter key to create line breaks	**Text and multimedia**: • I recognise that changes can be made to documents to improve appearance and add new ideas. • I talk about my use of text, graphics and sound. • I can add appropriate images • I can add or record a sound to enhance my work • I can add captions to photographs, graphics and sound • I can word process short texts. Use the enter key to create line breaks. Navigate around text in a variety of ways (mouse, arrow keys) as I edit my work
•	**Animation**: • With support I know how to use stop frame animation to tell the story	**Animation**: • I know how to use a stop frame animation • Use stop frame animation to tell the story … of the Great fire of London, etc.
Recognise common uses of information technology beyond school Year 1 – Unit 1.9 Year 2 – Unit 2.5 and in other units when appropriate.		
• I talk about my use of ICT and other ways of finding information	• I understand that messages can be sent electronically over distances and that people can reply to them. • I recognise what an email address looks like • I understand the different ways that messages can be sent, text letter ('snail-mail'), email,	• I understand that many different people can contribute to forums, wikis and blogs • I begin to talk about the advantages of using electronic communications • I understand that different forms of information (text, images, sound, multimedia) exist and

	phone … and begin to consider the advantages of each • I understand that communications can be in pictures, sound and text • I am beginning to understand that ICT gives rapid access to a wide variety of information and resources • With support, write and send a short email • With support I can enter key words into a search engine to find specific information for a topic	that some are more useful for specific purposes • I understand that information on the Internet can be misleading or wrong • I use simple authoring tools to create my own messages • I use appropriate buttons, menus and hyperlinks to navigate web sites or stored information • I enter key words into a search engine to find specific information for a topic • I locate specific sites by typing a website address (URL) into the address bar in a web browser.
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 the internet or other online technologies. Year 1 – Unit 1.1 Year 2 – Unit 2.2 and in all units when appropriate.		
•	• I know what 'friend' means in an online context and the importance of keeping personal information private • I understand why it is important to use and keep their personal passwords private • I understand and abide by internet safety rules • I am a responsible internet user and follow the school's acceptable use agreement for KS1 • Know what to do and who to turn to if anything on screen upsets me	• I understand that information on the Internet can be misleading, biased or wrong • I know how to report inappropriate content to a responsible adult • I discuss personal safety when using the Internet, including at home • I am a responsible internet user and follow the school's acceptable use agreement for KS1. Know what to do and who to turn to if anything on screen upsets me

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Year 3:

ALGORITHMS AND PROGRAMS
- experiment with variables to control models
- use 90 and 45 degree turns
- draw a square, rectangle & other regular shapes on screen, using commands
- write more complex programs

DATA RETRIEVING AND ORGANISING
- review images on a camera and delete unwanted images
- experienced downloading images from a camera into files on the computer
- use photo editing software to crop photos and add effects
- manipulate sound when using simple recording story boarding

COMMUNICATING
- use the email address book
- open and send an attachment

USING THE INTERNET
- find relevant information by browsing a menu
- search for an image, then copy and paste it into a document
- use 'Save picture as' to save an image to the computer
- copy and paste text into a document
- begin to use note making skills to decide what text to copy
- begin to understand the terms internet and network
- begin to understand unique passwords

DATABASES
- input data into a prepared database
- sort and search a database to answer simple questions
- use a branching database

PRESENTATION
- create a presentation that moves from slide to slide and is aimed at a specific audience
- combine text, images and sounds and show awareness of audience
- know how to manipulate text, underline text, centre text, change font and size and save text to a folder

E-SAFETY
- understand the need for rules to keep them safe when exchanging learning and ideas online
- recognise that information on the internet may not be accurate or reliable and may be used for bias, manipulation or persuasion
- begin to understand that the internet contains fact, fiction and opinion and begin to distinguish between them
- understand the need to keep personal information and passwords private
- recognise that cyber bullying is unacceptable and will be sanctioned in line with the school's policy and know how to report an incident of cyber bullying

Year 4:

ALGORITHMS AND PROGRAMS
- use repeat instructions to draw regular shapes on screen, using commands
- experiment with variables to control models
- make turns specifying the degrees
- give an on-screen robot specific directional instructions that takes them from x to y?
- make accurate predictions about the outcome of a program they have written

DATA RETRIEVING AND ORGANISING
- capture images using webcams, screen capture, scanning and internet
- choose images and download into a file
- download images from the camera into files on the computer
- copy graphics from a range of sources & paste into a desktop publishing program

COMMUNICATING
- appreciate the benefits of ICT to send messages and to communicate
- use the automatic spell checker to edit spellings

USING THE INTERNET
- use a search engine to find a specific website
- use note-taking skills to decide which text to copy and paste into a document
- use tabbed browsing to open two or more web pages at the same time
- open a link to a new window or open a document (PDF) and view it

DATABASES
- sort and search a database to answer simple questions
- recognise what a spread sheet is
- use the terms 'cells', 'rows' and 'columns'
- enter data, highlight it and make bar charts

PRESENTATION
- insert sound recordings into a multi-media presentation aimed at a specific audience

E-SAFETY
- use strategies to verify information, e.g. cross-checking
- understand the need for caution when using an internet search for images and what to do if they find an unsuitable image
- understand that copyright exists on most digital images, video and recorded music
- understand that if they make personal information available online it may be seen and used by others
- know how to respond if asked for personal information or feel unsafe about content of a message?
- know the difference between online communication tools used in school and those used at home
- understand the need to develop an alias for some public online use
- understand that the outcome of internet searches at home may be different than at school

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Year 5:

ALGORITHMS AND PROGRAMS
- combine sequences of instructions and procedures to turn devices on or off
- understand input and output
- use an ICT program to control an external device that is electrical and/or mechanical
- use ICT to measure sound or light or temperate using sensors
- write programs that have sequences and repetitions

DATA RETRIEVING AND ORGANISING
- listen to streaming audio such as online radio
- manipulate sounds using Audacity
- select music from open sources & incorporate it into multimedia presentations
- work on simple film editing

COMMUNICATING
- use instant messaging to communicate with class members

USING THE INTERNET
- use a search engine using keyword searches
- compare the results of different searches
- decide which sections are appropriate to copy and paste from at least two web pages
- save stored information following simple lines of enquiry
- download a document and save it to the computer
- identify reliable and unreliable sources online

DATABASES
- create a formula in a spreadsheet and then check for accuracy and plausibility
- search databases for information using symbols such as = > or <
- create databases planning the fields, rows and columns
- create graphs and tables to be copied and pasted into other documents

PRESENTATION
- use a range of presentation applications
- know how to prepare and then present a simple film
- use ICT to record sounds and capture both still and video images
- capture sounds, images and video
- use the word count tool to check the length of a document
- use bullets and numbering tools

E-SAFETY
- discuss the positive and negative impact of the use of ICT in their own lives and those of their peers and family
- understand the potential risk of providing personal information online
- recognise the potential risks of using internet communication tools and understand how to minimise those risks (including scams and phishing)
- understand that some messages may be malicious & know how to deal with it
- understand that online environments have security settings, which can be altered, to protect the user
- understand the benefits of developing a 'nickname' for online use
- understand that some malicious adults may use various techniques to make contact and elicit personal information
- know that it is unsafe to arrange to meet unknown people online
- know how to report any suspicions

Year 6:

ALGORITHMS AND PROGRAMS
- explain how an algorithm works
- detect errors in a program and correct them
- use an ICT program to control a number of events for an external device
- use ICT to measure sound, light or temperature using sensors and interpret the data
- explore 'what if' questions by planning different scenarios for controlled devices
- use inputs from sensors to trigger events
- check and refine a series of instructions

DATA RETRIEVING AND ORGANISING
- explore the menu options and experiment with images
- add special effects to alter the appearance of a graphic
- make an information poster using their graphics skills to good effect

USING THE INTERNET
- use complex searches using such as '+' 'OR' "Find the phrase in inverted commas"

DATABASES
- collect live data using data logging equipment
- identify data error, patterns and sequences
- use the formulae bar to explore mathematical scenarios
- create their own database and present information from it

PRESENTATION
- present a film for a specific audience and then adapt same film for a different audience
- create a sophisticated multimedia presentation
- confidently choose the correct page set up option when creating a document
- confidently use text formatting tools, including heading and body text

E-SAFETY
- EVERYTHING IN YEAR 5 PLUS
- recognise why people may publish content that is not accurate and understand the need to be critical evaluators of content
- understand that some websites and/or pop-ups have commercial interests that may affect the way the information is presented
- understand that some material on the internet is copyrighted and may not be copied or downloaded
- understand they should not publish other people's pictures or tag them on the internet without permission
- know that content put online is extremely difficult to remove
- they reference information sources
- use appropriate strategies for finding, critically evaluating, validating and verifying information, e.g. using different keywords, skim reading to check relevance of information, cross checking with different websites or other non ICT resources
- use knowledge of the meaning of different domain names and common website extensions (e.g. .co.uk; .com; .ac; .sch; .org; .gov; .net) to support validation of information

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To be working at '**GREATER DEPTH** in computing children can…

Year 3:	Year 4:	Year 5:	Year 6:
• search by keyword using a child friendly search engine • bookmark a page into your favourites • contribute to a class blog • use repeat command in logo to create a pattern • give an on-screen robot directional instructional	• use photo editing software to crop photographs and add effects • copy and paste the graph/bar chart and use it in a WP document • use animation in their presentation	• make a multimedia presentation that contains: sound; animation; video and buttons to navigate • save an image document as a gif or i peg. file format using the 'save as' command • make an information poster using graphics skills to good effect	• incorporate graphics where appropriate, using the most effective text wrapping formats • compare the information provided on two tabbed websites looking for bias and perspective

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Year 3	Year 4	Year 5	Year 6
Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts Year 3: Unit 3.1 Year 4: Units 4.1 and 4.5 Year 5 – Units 5.1 and 5.5 Year 6 – Units 6.1, 6.5 **Use sequence, selection, and repetition in programs; work with variables and various forms of input and output** Year 3: Units 3.1 and 3.3 Year 4: Units 4.1 and 4.5 Year 5 – Units Year 6 – Units 6.1, 6.5			
• I know how computer simulations can represent real or imaginary situations and how this can help in the wider world. Discuss their use of simulations and compare with reality. • I begin to apply and test sequencing skills in a variety of contexts and talk about my experiences. • I begin to know that there are many computer languages to write programs with. • I begin to know and understand the technical language used in programming • I begin to use logical reasoning to explain how simple algorithms work. • I solve open ended problems. • I design, write and run executable programs using a programming language.	• I know and understand the technical language used in programming and can apply it to different programs • I understand how everyday devices are controlled using inputs and outputs (e.g. automatic doors, traffic lights, intruder alarms) and that these may be physical or respond to a sensor. • I understand that a control box connected to a computer running appropriate software can be used to control devices (bulbs, buzzers, motors …) and that these can be simulated on screen. • I can design, write and run executable programs using a programming language e.g. Scratch, Kodu • I am able to explore the effect of changing variables. Use them to make and test predictions. • I use 'selection' in a programming sequence i.e. use 'if… then… else…' type actions or statements e.g. if a character is touching a wall then bounce back, else move forward. • I create simple flow diagrams to control physical devices or systems (real ones or on screen	• I use commands such repeat in programs to make them more efficient. E.g. Rpt4[FD5 RT90] to draw a square with Roamer • I understand that a model is a representation of a real world issue, system or situation. • I understand that a problem can be solved by decomposing it into sub-problems, solving them and combining them to solve the original problem • I can create a program which demonstrates a sequencing loop (e.g. If the temperature rises to N degrees turn on the fan; if the temperature drops to N-10 degrees turn off the fan) • I can create a program which includes a method of scoring (e.g. each time a sprite bumps into a particular object increase the score and each time it bumps into another object decrease the score)	• Understand that generalising a specific example can help to understand similarities and differences between examples (e.g. similarities between procedures to draw a square of side 3 and another to draw a square size 5 can be generalised to draw a square size N) • Understand the difference between constants and variables • Develop a simple model of a complex situation (e.g. a London Underground map is a simple model of a complex rail system, but it provides the traveller with just the right information to be able to travel efficiently.) • Create a program that requires a timer and set the variables as appropriate to the program (e.g. set a timer for a contestant to solve a maze within 30 seconds) • Teaching Logo to 'CIRCLE', controlling a model with 2 devices – motor / lights.

	simulations) using inputs, outputs, including sensors		
Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs Year 3: Units 3.1 and 3.3 Year 4: Units 4.1 and 4.5 Year 5 – Units 5.1 Year 6 – Units 6.1, 6.5			
• With support I can understand and can read algorithms • With support I am able to identify errors within simple algorithms and programs • With support I am able to debug an algorithm (set of instructions) and correct any errors	• I understand and can read algorithms • I am able to identify errors within simple algorithms and programs • I am able to debug an algorithm (set of instructions) and correct any errors	• I understand that algorithms may be decomposed into component parts (procedures), each of which is itself an algorithm • Predict how a provided algorithm will behave before testing it (e.g. write a program or procedure in symbols and ask pupils to 'write the story' of the outcome before testing it.) • Represent an algorithm symbolically (e.g. as a flow chart) to plan a procedure • Develop algorithms which include 'if' statements (e.g. if the temperature drops below...) and loops (e.g. repeat [an instruction] 4 times)	• I can explain logically, using appropriate technical language, how some algorithms work • Develop more complex flow diagrams and procedures that draw on others (e.g. program traffic lights either end of a narrow bridge so that cars don't collide) • Refine procedures (algorithms) to improve efficiency and achieve desired outcomes
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 Year 3: Unit 3.5 Year 4: Units 4.2, 4.7 and 4.8 Year 5 – Unit 5.2 Year 6 – Units 6.2, 6.4, 6.6 **Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.** Year 3: Units 2.5 and 4.7 Year 4: Unit 4.7 Year 5 - Unit 4.7 Year 6 – Unit 6.2			
• I know that a network is a group of computers that are connected so that they can communicate and share resources and data with each other • I know that an individual's user name and password gives them unique access to particular or personal areas on the school network and that their use is monitored to keep them safe •	• I know that computers communicate with each other using shared 'protocols' – the signals, messages and "passwords" that different computers use when "talking" to each other. E.g. a classroom is a network with the teacher and lots of children (communicating devices). • I understand that search technologies include but are not limited to internet search engines	• I understand that the Internet is a global computer network and a provider of multiple services • I understand the importance of password security • Exchange information internally, taking care that communications are appropriate in tone and content. • I am able to explain that the computers in the classroom are part of the school network. That they are connected by wires (or wirelessly) to a main computer	• Know that there are various ways in which computers can be linked and that networking allows different users to access different parts of the network and beyond • I understand that electronic communications may be misinterpreted as a result of the lack of personal interaction • Explore the design of the school network to develop an appreciation of how the computers and other devices

• I understand my username and paste word are my 'key' to access my saved data • I am able to locate my own folder on a particular drive to save and retrieve my work • I use a range of resources where pupils can share ownership of on-line document s to collaborate with others • I search for files or e-mails using relevant search techniques e.g. grouping an inbox by From to find all e-mails from a particular source	• I understand the importance of phrasing searches appropriately to get the most accurate results • I know that search engines will produce differently ranked results for the same searches. • Routes and rules (protocols) are made and understood for communicating with each other (hands up before speaking to the teacher, formality of language used) • I understand that the Internet and the World Wide Web are not the same thing – the WWW is a collection of hyperlinked web pages and websites and is just one of the many services provided over the Internet • I understand that The Internet is the host to many different parts – The World Wide Web, Email, File Transferring, Chat Rooms, News Groups. • I upload photographs from the school camera or i-pad to the class folder on the network. • I access a given website by typing in the URL (Uniform Resource Locator) into the address bar of a browser and be able to explain what the different parts of the 'address' (URL) refer to • I am able to explain what the school's monitoring software does and why it has been installed	called the server. Other devices such as printers, projectors and visualisers may also be connected. Draw or a label a diagram to show this. • I am able to explain that the server is connected to the Internet which is made up of a global network and is able to communicate with other servers to share resources and data. Draw or a label a diagram to show this. • Be able to identify when search results are being influenced by commercialism, advertising or filtering • Check the results of any searches by referring to other sources whether digital or paper-based	are connected to each other and the Internet.

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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

Year 3: Units 3.4, 3.5, 3.6, 3.7 and 3.8 | Year 4: Units 4.1, 4.3, 4.4 and 4.6 | Year 5 - Units 5.1, 5.3, 5.4, 5.5, 5.6, 5.7 | Year 6 – Units 6.1, 6.3, 6.4, 6.5, 6.7

Year 3	Year 4	Year 5	Year 6
Databases: • I know, understand and use the vocabulary: *file, record, field, data, information.* • I know and understand the difference between data and information. • I talk about the advantages of using ICT to change, sort, integrate and classify data quickly. • I collect appropriate data, enter it into a database and use the database to generate and compare graphs and answer simple questions and provide information • I change the contents of cells in a spreadsheet to explore "What if …" questions • I use a spreadsheet to record data and produce graphs • I create and use a branching database to organise and sort data to answer questions	**Databases**: • I understand and begin to make choices about how to organise data to solve a specific problem. • I use a spreadsheet to explore simple patterns (eg in a number square) • I determine the data needed to answer a specific question; organise, present, analyse and interpret the data in tables, graphs and charts • I begin to develop skills to identify clearly what data needs to be collected and design a questionnaire or use an input device (e.g. data logger) to aid its collection	**Data logging**: • Use the pre-programming features of data logging software and devices to set up a specific data capture over a period of time. • I understand which searches and graph types are relevant to specific problems and types of information. • I understand that spreadsheets can automate functions, making it easier to test variables (eg when planning a budget you can change number of items and see the changed total cost) • I understand the need for accuracy and frequent checking when entering formulae. • Enter formulae into a spreadsheet and modify the data, (simple calculations + - × ÷) • Design questions using key words, to search a large pre-prepared database. • Enter labels and numbers into a spreadsheet • Construct, refine and interpret frequency tables; bar charts with grouped discrete data; line graphs; interpret pie charts. • Use more advanced formulae (Sum, average, mode etc)	**Data logging**: • Use a range of external sensors (heart rate monitors, light gates, etc) in a variety of situations in the course of scientific investigations. • I recognise the consequences of data not being accurate, relate to the wider world (e.g. Police, doctors', banks', schools' databases). • I understand the importance of presentation techniques aimed at specific audiences and take account of the need for accuracy. • I understand the need for data protection and some of the rights of individuals over stored data and how it affects use and storage of data in the real world. • Use complex searches (and/or, is greater/less than) to search data when looking for relationships and patterns in data. • Check for accuracy by checking data, using different views, search tools, and graphing. Identify and correct inaccuracies. • Solve complex enquiries involving selecting, processing, and presenting data; drawing conclusions from the process

			• Identify and enter the correct formulae into cells, modify the data, make predictions of changes and test them • Copy formulae to create tables of results • Use information from the analysis of data to present findings in another application
Text processing and multi-media: • I recognise how to create different text types to meet the needs of the audience (e.g. poster, newspaper, menu, instructions, etc) • I understand that evaluation and improvement is a vital part of a design process and that ICT allows changes to be made quickly and efficiently. • I use different font sizes, colour and effects to communicate meaning for a given audience. • I begin to use layout, format, graphics and illustrations for different purposes or audiences • I can insert and edit simple tables • I use page setup to select different page sizes and orientations • I use Cut, copy and paste to refine and reorder content •	**Text processing and multi-media**: • I compare the different contributions of sounds, words and images • I recognise the features of good page design and multimedia presentations • I develop increasing sense of audience and talk about my choices and decisions • I select suitable text, sounds and graphics from electronic resources and use it appropriately their own work • I select and import sounds from my own recording, create my own effects and music and import from other sources • I select and import graphics and prepare for use (cropping, resizing, editing) • I recognise key features of layout and use design features such as text boxes, columns, borders. • I recognise that ICT can • automate manual processes • (eg. find and replace). • I understand the advantages and disadvantages of this • I use appropriate editing tools to ensure their work is clear and error free (using tools such as spell	**Text processing and multi-media**: • I can show an increasing awareness of the intended audience and effect • Understand the potential of multimedia to inform or persuade and know how to integrate words, images and sounds imaginatively for different audiences and purposes. • Format and edit work to improve clarity and mood, use a range of tools e.g. cut and paste, justify, tabs, insert and replace • I create a range of hyperlinks and produce a non-linear, interactive presentation	**Text processing and multi-media**: • I recognise the features of good design in different printed and electronic texts (eg poster, website, presentation, etc) Talk about design in context of their own work • Develop and use criteria to evaluate the design and layout when evaluating a range of web sites, pages on Learning Platforms, online resources and presentations • Understand how pages are linked together and recognise the need for clarity. • Develop their use of hyperlinks to produce more effective interactive, non-linear presentations. • Make effective use of transitions, music and animations in presentations.

	checker, thesaurus, find and replace)		
Sound and music: • I use music software to experiment capturing, repeating and reordering sound patterns. • I use music software to create a simple multipart percussion composition • I use ICT to create and perform sounds or music that would otherwise not be possible live – e.g. playing a multi-part piece or a very fast piece	**Sound and music**: • I talk about software which allows easy manipulation and creation of sound and music • I understand that all types of sounds can be combined in editing software. • I use recorded sound files in other applications • I locate, select, import and edit use sound files.	**Sound and music**: • I begin to understand that copyright exists on most recorded music and that downloading music from the internet should be done in accordance with the law. • I am aware of different sound file formats (e.g. MP3, WAV) and their use as appropriate with other applications. • I am able to edit and manipulate sounds and import them to other applications • Independently select, edit and combine sound files from internet sources to create a podcast file (audacity) • Develop skills in manipulating sounds (such as reversing sounds, adding echo, altering speed …) and use them appropriately considering audience and purpose • Independently select and use a variety of appropriate devices to record musical and non-musical sounds	**Sound and music**: • Understand issues relating to copyright of music – e.g. when selecting samples • Judge when it is appropriate to use podcasting as a means of communication • I know how to upload and download projects • Create their own sounds and compositions to add to their presentations / films / images / photos. • Use ICT to produce music for a specific purpose, considering the impact on the audience (eg length, style, genre etc.)
Digital images and graphics package: • I understand that a digital image can be captured from a number of different devices and it can be stored, developed and enhanced • I begin to understand how images from different sources (stills, video, graphics, animation) are used to enhance a	**Animation**: • I understand that evaluation and improvement is a vital part of a design processes and ICT allows for to make changes quickly and efficiently • I understand the need for caution when using the internet to search for images and what they should do if they find images that upset	•	•

presentation or communicate an idea • I begin to independently capture, store, retrieve and edit a digital image • I develop greater control over the digital stills video camera and use the enhanced tools (Macro, Landscape, Zoom) • I discuss and evaluate the quality of their own and others' captured images and make decisions (e.g. keep, delete, change) • I acquire, store and retrieve images from cameras, scanners and the internet and begin to use paint packages or photo-manipulation software to change an image *(e.g. apply different effects)* • I select specific areas of a painting, copy and paste to make repeating patterns. Resize elements. Investigate symmetry and reflection tools.	them. (See school's Acceptable Internet Usage Policy). • Understand that film conveys meaning and begin to understand the "language of film" • I create a short animated sequence from captured images in simple storyboarding software, to communicate a specific idea. • I capture "footage" from camcorders into simple movie editing software. Arrange, trim and cut clips to create a short film that convey meaning • I import music and stills into video editing software and add to film projects. • I can add simple titles and credits		
Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. Year 3: Units 3.2 and 3.5 Year 4: Unit 4.2 and discussed in other units Year 5 – Unit 5.2 and discussed in other units Year 6 – Units 6.2, 6.4 and discussed in other units			
• Understand that email has to be sent to a specific email address and the need for accuracy. • I understand a website has a unique address and the need for precision when typing it • I evaluate different search engines and explain their choices in using these for different purposes • I can log on to an email account, open emails, create and send appropriate replies.	• I talk about different forms of electronic communication and their use of it, its advantages and disadvantages. • I begin to recognise that anyone can author on the internet and sometimes web content is inaccurate and even offensive • I develop my knowledge of internet safety and the need for rules. Understand what I should do if they discover offensive material	• I understand that computers in school (and possibly at home) filter internet content. • I am able to talk about personal safety when using the internet, at home and in school, and know how to keep safe and what to do if they find inappropriate materials. • Recognise that e-safety must be considered wherever on-line activity takes place – not just in school.	• Understand the importance of personal safety when using any electronic communications, including some of the wider issues (e.g. how to deal with cyber bullying, inappropriate use of electronic communications). • Develop and communicate appropriate rules for e-safety as it relates to electronic communication.

• I can create and send an email to a prearranged partner, selecting the recipient from a class address book. • I am able to use emails effectively as a form of communication and sharing of information • I can attach different files to emails • I can contribute safely to discussion forums, blogs and surveys. • Save and retrieve accessed information through the use of Favourites, History, and Save As, Bookmarks… • I can copy, paste and edit relevant information • I understand there are rules to keep myself safe when communicating electronically, work within these rules understanding what they are and why they exist.	• I understand the dynamics of search engines and know that there are different search engines - some within sites, and some for the whole of the Internet (e.g. Google). Use them appropriately • I use search engines for different media (e.g. Google Image Search, video, www.findsounds.com)		