LBBD Computing and ICT Framework 2014

Structure:

The framework for the new Computing and ICT curriculum has been broken into five strands:

Programming	Data	Communication	Digital Literacy & Research	Multimedia
Programming Simulations	Graphs Databases Spreadsheets	Word processing Presentations Online collaboration	Research E-safety	Creating images Photography Animation Video Audio

- Objectives per strand are listed for each year group in the following pages, with some suggested activities. By the end of **KS1** pupils should be able to **save** and **retrieve** their work to edit it, and **print** their work.
- A **glossary** of terms has been included as **appendix 1**.
- This framework has been written with input from ICT Subject Leaders. It covers the new Computing Curriculum requirements, and also areas that we felt were important to continue to include. A list of colleagues who contributed via the subject leader workshops is included in **appendix 2**.

Guidance:

- For all areas, wherever possible, make links back to **real life** – how and why are the different concepts are used both in and outside school. This is so that the pupils can start to see the relevance of Computing and ICT.
- Different schools will not necessarily have all the software / apps listed. **Not all the software / apps will be needed** – the list shows the range that might be available in different schools. It is suggested that schools modify this document to include software / apps that are relevant to them.
- Pupils need to have experience of a range of software / apps for each strand. For example, they should experience different software for word processing, not just Word. For the **programming** strand, the recommendation is that **pupils use two resources in each year group** – for example one app, one piece of software, or programming one piece of hardware and one piece of software, or two pieces of software. This is so that pupils can see how the knowledge and skills they have gained using one application can be transferred to another.
- A list of resources (hardware, software, apps) is available on the Computing and ICT site of the Learning Gateway.

E-safety guidance

- When searching the internet for information, care and consideration needs to be given as to the most appropriate method. This will depend on the age of the class.
- Younger children should be searching within a website such as the BBC, using a Google custom search (only searching a set of pre-determined sites), or using a child-friendly search engine such as One Key, Yahooligans or Ask Kids.
- Teachers should test out searches before the children do to ensure the search terms and results are appropriate.
- It is not recommended to use Google image search, especially with children – the internet content filter cannot distinguish between appropriate and inappropriate images as it uses text to filter websites. There are child-friendly image sites which can be used for image searching, or search for a website and select appropriate images.
- Each class will need to establish what the children should do if they find something inappropriate online – turn off the monitor and tell an adult.

Effective learner objectives

In each unit within the Computing and ICT framework, focus on at least two of the following objectives. These can be covered by any year groups, at any time. Some of these objectives will lend themselves to certain topics better than others, or teachers may feel that certain pupils or classes need to focus on specific objectives.
These objectives do not only relate to Computing and ICT.

Ability to work independently	Ability to work with each other	Resilience and challenge	Creativity	Academic progress
I can take independent notes at appropriate times	I am willing to work with others	I attempt tasks set or extension work	I can come up with ideas and use these ideas to help myself	I am enthusiastic about the lesson and contribute
I do not rely on the teacher or other students for work	I share thoughts and ideas with the rest of the group or class	I ask relevant questions of the teacher	I am keen to express my ideas in different ways	I am keen to improve
	I communicate relevantly within a group	I engage in different activities and small competitions, accepting and embracing challenges	I take other's ideas into account alongside my own	I understand how to improve
			I use a wide variety of sources effectively	

PrimaryComputing.co.uk

Computing Programme of Study 2014

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.	**Aims** 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.
Subject content – by the end of Key Stage 1 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.	**Subject content – by the end of Key Stage 2 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.

Year 1: Programming

Computing programme of study – by the end of KS1 pupils should be taught to:

- understand what algorithms are; how they are implemented as programs on digital devices
- recognise common uses of information technology beyond school

Objectives

Programming:

P1.1 I can move a programmable toy in different directions, by giving and following instructions
P1.2 I can combine commands to follow a route
P1.3 I can explore outcomes when a instructions are given in different orders
P1.4 I can explain what an algorithm is
P1.5 I can describe and write algorithms to complete specific tasks

What this looks like

- Using Bee-Bot on floor mat to ensure can enter commands to follow route, plan and follow own route – Bee Bot challenges
- Reinforce with software and apps – use more than one piece of software / app
- Describe how non-digital algorithms be used, e.g. a set of instructions in maths or literacy for a specific purpose
- Knowledge of algorithm and terminology:
    - An algorithm is a set of instructions to achieve a goal
    - Algorithms can be carried out by humans and computers
    - There may be more than one algorithm for a task, but efficient algorithms are best

Resources

Hardware: Bee-Bot
Software: Focus on Bee-Bot, 2simple 2go,
Online: Espresso Coding,
Apps: Bee-Bot, On line tools - Scratch, Daisy the dinosaur, Scratch Jr, Light
Other resources: ICT framework v5 Y1 Control

EYFS objectives

CS0.1 Use a variety of electronic toys in play situations (dance mats, Bee-Bots, remote control toys) using basic directional language
CS0.2 Explore toys that simulate control devices e.g. traffic lights, scanner, microwave, cash tills
CS0.3 Explore the commands needed to control a range of electronic toys
CS0.4 Be aware of everyday devices that sense data e.g. bar codes, metal detectors, sound recorders, light sensors, automatic doors, thermometers
CS0.5 Program a simple floor robot (Bee-Bot / Roamer) to carry out a short sequence of steps
MS0.1 Respond to simple cause and effect devices (push a button to hear a sound)
MS0.2 Play with a simple adventure program or simulation / role play software, and begin to compare reality with virtual world
MS0.3 Respond appropriately to what happens in simulations and begin to notice that different responses result in different outcomes

Year 2 objectives

Programming:

P2.1 I can plan out and enter a sequence of commands to carry out specific tasks
P2.2 I can reorder a sequence of instructions and correct errors in programs (debug)
P2.3 I can explain what a program is
P2.4 I can predict the outcome of a program

Simulations:

P2.5 I can explore a computer simulation that copies real life

Curricular links

Geography – maps, plan a route
Maths – positional language
Literacy – writing and following instructions, storytelling – the map of a story

Year 1: Data	**Computing programme of study** – by the end of KS1 pupils should be taught to: • use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school	
Objectives **Graphs:** **D1.1** I can sort items into sets or simple tables **D1.2** I can draw a simple graph, e.g. pictogram / block graph **D1.3** I can explain what the graph shows	**What this looks like** • Sort objects / items into groups by given and own criteria • Collect a set of data – as class / group / individual and present as a simple graph • Talk about the graph and what it shows	**Resources** **Software**: My World **Online:** iBoard (TES) **Other resources**: ICT framework v5 Y1 Handling data
EYFS objectives **HD0.1** Begin to develop simple classification skills by carrying out simple sorting activities away from the computer **HD0.2** Continue to develop simple classification skills by carrying out simple sorting activities using ICT **HD0.3** Produce simple pictograms with help	**Year 2 objectives** **Databases:** **D2.1** I can read and use a simple database to find information **D2.2** I can add information to a database **D2.3** I can collect and record data purposefully **D2.4** I can present data in a bar chart **D2.5** I can answer and ask questions about bar charts	**Curricular links** Maths – pictograms, sorting into sets e.g. shapes Science – sorting materials Geography – survey linked to school location / local area / homes

Year 1: Communication	**Computing programme of study** – by the end of KS1 pupils should be taught to: • use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school	
Objectives **Word processing:** **C1.1** I can use letters, basic punctuation, spacebar and enter key to type words and sentences quickly **C1.2** I can use backspace to make corrections **C1.3** I can use shift key for punctuation	**What this looks like** • Pupils use word processing software to write letters, stories, poems • Be able to edit work, not just start again • Save work and retrieve	**Resources** **Software**: 2Publish, 2Publish+, 2create a story, Clicker 5 **Online**: **Other resources**: ICT framework v5 Y1 Communication
EYFS objectives **C0.1** Develop mouse control **C0.2** Use a paint program to make marks, using simple tools, to communicate their ideas **C0.5** Use different forms of electronic communication in free play **C0.6** Begin to use a keyboard to produce text on screen, and develop familiarity with letters, numbers, backspace, arrow keys and space bar	**Year 2 objectives** **Word processing:** **C2.1** I can edit and improve my work by changing, adding or removing words **C2.2** I can change the font size, colour and style to change my work	**Curricular links** Various topic links Literacy - stories

Year 1: Digital Literacy & Research	**Computing programme of study** – by the end of KS1 pupils should be taught to: • 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	
Objectives **Research:** **R1.1** I can explore a website using buttons, menus and hyperlinks **R1.2** I can use the 'back' button **R1.3** I can read words, look at pictures and watch videos on a website to find information **E-safety:** **R1.4** I know I need to follow rules to keep safe online **R1.5** I know what private information is and that I shouldn't share it online	**What this looks like** • Navigate and explore given websites – access via shortcut or favourite • Navigate with purpose, e.g. to find information • Talk about information they can find on website • Be aware of the e-safety implications of accessing websites – what to do if they see something inappropriate • Pupils should not be searching on the internet at this stage unless under supervision and the adult has previously performed the search	**Resources** **Online**: Espresso, iBoard, age appropriate websites linked to topic / interest **Other resources**: ICT framework v5 Y1 Research; SWGfL Digital Literacy and Citizenship
EYFS objectives **R0.1** Use a shortcut to navigate to a specific website **R0.2** Use appropriate buttons, menus and hyperlinks to navigate a teacher selected website, CD-ROM or stored information **R0.3** With support, use appropriate websites or CD ROMs to locate small amounts of information / images	**Year 2 objectives** **Research:** **R2.1** I can find out facts by navigating websites **R2.2** I know each website has a unique address **R2.3** I can navigate to a website via favourites and typing in address **R2.4** I know not all the information found on the internet will be accurate or useful **R2.5** I can use a search engine to find facts using key word search **E-safety:** **R2.6** I know what to do if I find something inappropriate online, & where to go for help **R2.7** I know how to stay safe by going to appropriate websites **R2.8** I know that the messages or images I put online leaves a trail **R2.9** I know how to behave safely and respectfully online	**Curricular links** Various topic links Geography – weather, countries History – famous people Science – BBC Science clips

Year 1: Multimedia	**Computing programme of study** – by the end of KS1 pupils should be taught to: • use technology purposefully to create, organise, store, manipulate and retrieve digital content	
Objectives **Creating images:** **M1.1** I can paint with different colours using undo or eraser to correct mistakes **M1.2** I can use different tools such as brush, pen, line, shape and fill **Photography:** **M1.3** I can use a digital still camera to take a picture **M1.4** I understand the need to frame the image and keep the camera still **Audio:** **M1.5** I can record an audio recording **M1.6** I can play back an audio recording	**What this looks like** • Create pictures linked to other topic exploring different tools. Start to use tools with more expertise and precision • Take photographs for a purpose e.g. of their model or practical maths work to share with others. Become more skilled at framing and taking photographs • Combine photographs / images in an online book • Make sound recordings for a purpose e.g. poems to be saved for class anthology; weather report to accompany weather map; interview with famous person	**Resources** **Hardware**: digital camera, web-cam (on PC or mobile device), **Software**: Colour Magic, Clicker 5 **Online**: **Apps**: inbuilt camera and sound recorder, Morfo Booth, My Story **Other resources**: ICT framework v5 Y1 Communication
EYFS objectives **C0.3** Use multimedia equipment, e.g. digital cameras, video cameras, webcams and visualisers, to capture still and moving images **C0.4** Explore ways of making and listening to sounds using simple programs and devices	**Year 2 objectives** **Photography:** **M2.1** I can discuss the quality of my images and make decisions e.g. delete a blurred image **M2.2** I can use a photograph within a document **M2.3** I can combine a set of photographs to tell a story **Video:** **M2.4** I can capture video **M2.5** I understand the need to frame the image and move the camera carefully **M2.6** I can play back a video recording	**Curricular links** Literacy – take photos and sequence linked to instructions Geography – create a weather report History – 'radio' interview of a famous person

<table>
<tr><td>Year 2: Programming</td><td colspan="2">Computing programme of study – by the end of KS1 pupils should be taught to:
how algorithms 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
recognise common uses of information technology beyond school</td></tr>
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Programming:
P2.1 I can plan out and enter a sequence of commands to carry out specific tasks
P2.2 I can reorder a sequence of instructions and correct errors in programs (debug)
P2.3 I can explain what a program is
P2.4 I can predict the outcome of a program

Simulations:
P2.5 I can explore a computer simulation that copies real life</td><td>What this looks like
Pupils make predictions of how to move a robot from x to y and check if they were correct
Pupils problem solve and correct errors to achieve the outcome correctly
Test and correct a set of give instructions
Explore simulations and see how they might be similar / different to real life. Discuss when simulations might be useful</td><td>Resources
Hardware: ProBot, Roamer,
Software: Textease Turtle
Apps: Kodable, Move the turtle, Daisy the dinosaur, Scratch Jr
Online: Espresso Coding, 2code (Chimp mode), Sherston
Other resources: ICT framework v5 Y2 Control

Online: Google Earth, Google Maps, BBC Science Clips, Bethnal Green Museum of Childhood ‘walkthrough’</td></tr>
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Programming:
P1.1 I can move a programmable toy in different directions, by giving and following instructions
P1.2 I can combine commands to follow a route
P1.3 I can explore outcomes when a instructions are given in different orders
P1.4 I can explain what an algorithm is
P1.5 I can describe and write algorithms to complete specific tasks</td><td>Year 3 Objectives
Programming:
P3.1 I can refine a program by using the repeat command
P3.2 I can create a procedure (group of commands) to do a specific task, draw a specific shape
P3.3 I can solve problems by breaking them into smaller parts

Simulations:
P3.4 I can explain how to control a simulation
P3.5 I can explain how a simulation is and isn’t realistic</td><td>Curricular links
Maths – positional language, coordinates, rotation
PE – obstacle courses, gym / dance routines
Science – testing simulations and when this might be useful if testing in reality would be difficult</td></tr>
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Year 2: Data	**Computing programme of study** – by the end of KS1 pupils should be taught to: • use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school	
Objectives **Databases:** **D2.1** I can read and use a simple database to find information **D2.2** I can add information to a database **D2.3** I can collect and record data purposefully **D2.4** I can present data in a bar chart **D2.5** I can answer and ask questions about bar charts	**What this looks like** • Understand that a database is a set of information organised by fields of information • Navigate an online database to find answers to questions (e.g. Animal Facts) • Navigate a simple database to find information and answer questions, e.g. how many clowns have red noses • Use record card to add information to a database • Collect data on a chosen topic e.g. linked to favourite food, transport survey. Present as a bar chart and show understanding through answering and asking questions.	**Resources** **Software**: Textease Database, Starting Graph, 2graph **Online**: Espresso, Big Bus Animal Facts book http://ngfl.bdcs.org.uk/bigbus/index.html **Other resources**: ICT framework v5 Y2 Research and Y3 Handling Data
Year 1 Objectives **Graphs:** **D1.1** I can sort items into sets or simple tables **D1.2** I can draw a simple graph, e.g. pictogram / block graph **D1.3** I can explain what the graph shows	**Year 3 Objectives** **Databases:** **D3.1** I can create a branching database to sort and organise items **D3.2** I can filter and sort records in a database to answer questions **D3.3** I can design a questionnaire to collect information, and display the information in a graph or table	**Curricular links** Literacy – information texts about animals Maths – sorting, databases Science – categorising features of animals and creating record cards by looking for information relating to certain fields

Year 2: Communication	**Computing programme of study** – by the end of KS1 pupils should be taught to: • use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school	
Objectives **Word processing:** **C2.1** I can edit and improve my work by changing, adding or removing words **C2.2** I can change the font size, colour and style to change my work	**What this looks like** • Use and improve word processing skills in a range of situations. Use wider range of punctuation, editing and formatting skills to improve their work • Be able to discuss how they have changed their work and how it can be improved	**Resources** **Software**: 2publish, 2publish+, Clicker 5, Word **Apps**: Book Creator, 2create a story **Online**: Espresso, **Other resources**: ICT framework v5 Y2 Communication
Year 1 Objectives **Word processing:** **C1.1** I can use letters, basic punctuation, spacebar and enter key to type words and sentences quickly **C1.2** I can use backspace to make corrections **C1.3** I can use shift key for punctuation	**Year 3 Objectives** **Word processing:** **C3.1** I can use cut, copy and paste to reorder content **C3.2** I can use and resize graphics within my work **C3.3** I can use spell check to aid my writing **Presentations:** **C3.4** I can type text and insert images onto pages **C3.5** I can add text effects and move items around to find the best layout **Online collaboration:** **C3.6** I can send and reply to online messages, such as email, respectfully **C3.7** I can add and open attachments **C3.8** I know not to open messages and attachments from strangers	**Curricular links** Producing range of written work linked to various topics

Year 2: Digital Literacy & Research	**Computing programme of study** – by the end of KS1 pupils should be taught to: • 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	
Objectives **Research:** **R2.1** I can find out facts by navigating websites **R2.2** I know each website has a unique address **R2.3** I can navigate to a website via favourites and typing in address **R2.4** I know not all the information found on the internet will be accurate or useful **R2.5** I can use a search engine to find facts using key word search **E-safety:** **R2.6** I know what to do if I find something inappropriate online, & where to go for help **R2.7** I know how to stay safe by going to appropriate websites **R2.8** I know that the messages or images I put online leaves a trail **R2.9** I know how to behave safely and respectfully online	**What this looks like** • Be aware that each website has a specific address and that the address needs to be entered correctly – navigate to websites by entering address, and use to find information for topic work • Discuss how there might be adverts on web pages – and these can mainly be ignored • Discuss how some information may be inaccurate e.g. tomato spider • Use key words related to topics to search for information within a safe environment e.g. within BBC site or set up Google custom search for pupils to safely search the internet (will only return searches from websites you have specified)	**Resources** **Online**: Espresso, One Key search engine, BBC schools, BBC nature, Google custom search, Tomato spider site (http://webfronter.com/rbkc/tomatospider/), kidrex.org **Other resources**: ICT framework v5 Y2 and Y3 Research; SWGfL Digital Literacy & Citizenship
Year 1 Objectives **Research:** **R1.1** I can explore a website using buttons, menus and hyperlinks **R1.2** I can use the 'back' button **R1.3** I can read words, look at pictures and watch videos on a website to find information **E-safety:** **R1.4** I know I need to follow rules to keep safe online **R1.5** I know what private information is and that I shouldn't share it online	**Year 3 Objectives** **Research:** **R3.1** I can type in a URL to find a website **R3.2** I can search online for images and information safely **R3.3** I can talk about the reliability of information on the internet **E-safety:** **R3.4** I can present the information I have found and share it with others **R3.5** I know why we need to keep passwords safe and secure	**Curricular links** Purposefully navigate sites and search for information relating to different topics e.g.: Science – animals History – famous people Geography – local area

Year 2: Multimedia	**Computing programme of study** – by the end of KS1 pupils should be taught to: • use technology purposefully to create, organise, store, manipulate and retrieve digital content	
Objectives **Photography:** **M2.1** I can discuss the quality of my images and make decisions e.g. delete a blurred image **M2.2** I can use a photograph within a document **M2.3** I can combine a set of photographs to tell a story **Video:** **M2.4** I can capture video **M2.5** I understand the need to frame the image and move the camera carefully **M2.6** I can play back a video recording	**What this looks like** • Take photographs and review quality, deleting those that are blurred etc – be selective and consider how their photos could be improved • Use photos within document / online book – take photos for a purpose • Take set of photos to share e.g. photos on a trip, stages of cooking to then sequence and share with others • Take it in turns to be the class photographer, documenting key events and sharing via blog or website • Take video clips with purpose e.g. recording weather report presented by another pupil, interview a famous person / linked to a news story • Start to be more discerning when taking video – framing image and zooming in before filming as appropriate	**Resources** **Hardware**: mobile device in built camera / video camera, digital camera, digital video camera, web cam **Software**: 2create a story, 2create, 2paint a picture, 2photo simple, PowerPoint **Apps**: Book Creator, MashCAM, Do Ink Green Screen **Online**:
Year 1 Objectives **Creating images:** **M1.1** I can paint with different colours using undo or eraser to correct mistakes **M1.2** I can use different tools such as brush, pen, line, shape and fill **Photography:** **M1.3** I can use a digital still camera to take a picture **M1.4** I understand the need to frame the image and keep the camera still **Audio:** **M1.5** I can record an audio recording **M1.6** I can play back an audio recording	**Year 3 Objectives** **Creating images:** **M3.1** I can use the print screen function to capture an image **M3.2** I can select and use a certain area of an image **Video:** **M3.3** I can zoom in and out on subjects appropriately **M3.4** I can download the video files from the video camera **M3.5** I can combine video clips to create a video **M3 .6** I can add simple titles and credits **Audio:** **M3.7** I can re-record an audio recording to improve clarity **M3.8** I can download and save a recording	**Curricular links** Literacy – sequencing instructions, recount History – interview with a famous person Geography – producing news story and weather report from a different country Science – recounting science experiment

Year 3: Programming	**Computing programme of study** – by the end of KS2 pupils should be taught to: • solve problems by decomposing them into smaller parts • use sequence, selection and repetition in programs	
Objectives **Programming:** **P3.1** I can refine a program by using the repeat command **P3.2** I can create a procedure (group of commands) to do a specific task, draw a specific shape **P3.3** I can solve problems by breaking them into smaller parts **Simulations:** **P3.4** I can explain how to control a simulation **P3.5** I can explain how a simulation is and isn't realistic	**What this looks like** • Write programs in Logo and other software to draw different regular shapes – refine using the repeat command • Use programming software / apps to create procedures and use within a longer program • Plan out program and break into smaller steps when tackling the structure, incorporating procedures • Explore online simulations, explaining rules behind the simulations and how they can be realistic / represent reality. Discuss how simulations can be used	**Resources** **Software**: Scratch (online), CoCo, **Apps**: Move the turtle, Hopscotch, Kodable, Cato's Hike **Online**: Espresso Coding, Scratch2, simulations (e.g. science clips), Google Earth **Other resources**: ICT framework v5 Y3 and Y4 Control **Wii simulations**: My Sims, Endless Ocean, Science Papa
Year 2 Objectives **Programming:** **P2.1** I can plan out and enter a sequence of commands to carry out specific tasks **P2.2** I can reorder a sequence of instructions and correct errors in programs (debug) **P2.3** I can explain what a program is **P2.4** I can predict the outcome of a program **Simulations:** **P2.5** I can explore a computer simulation that copies real life	**Year 4 Objectives** **Programming:** **P4.1** I can use if…then command within a series of instructions **P4.2** I can test existing programs to see how they could be improved **P4.3** I can write a program for a specific purpose, incorporating features such as inputs, repetition and procedures	**Curricular links** Maths – problem solving by breaking problem into smaller steps Science simulations

Year 3: Data	**Computing programme of study** – by the end of KS2 pupils should be taught to: • use search technologies effectively	
Objectives **Databases:** **D3.1** I can create a branching database to sort and organise items **D3.2** I can filter and sort records in a database to answer questions **D3.3** I can design a questionnaire to collect information, and display the information in a graph or table	**What this looks like** • Explore branching database to see how it works and is structured • Sort a set of items in different ways to consider different sorting options • Create a branching database to sort a set of items • Explore a database by asking questions to find relevant information • Find information for graph on given topic by considering questions to ask participants, and design questionnaire to find the information	**Resources** **Software**: Textease Branch, Information magic, Textease Database **Apps**: Wild Key (key needs purchasing) **Other resources**: ICT framework v5 Y4 Handling data, Guess Who board game (for idea of branching database), Science keys for identifying creatures
Year 2 Objectives **Databases:** **D2.1** I can read and use a simple database to find information **D2.2** I can add information to a database **D2.3** I can collect and record data purposefully **D2.4** I can present data in a bar chart **D2.5** I can answer and ask questions about bar charts	**Year 4 Objectives** **Graphs:** **D4.1** I can present data in a graph, selecting the most appropriate layout **D4.2** I understand the difference between discrete and continuous data **D4.3** I can answer questions relating to graphs, and pose my own questions **D4.4** I can use my graph in a document / presentation to share findings with others **Spreadsheets:** **D4.5** I can add text and numbers to spreadsheet cells **D4.6** I can add simple formulae: +-*/ **D4.7** I can change the appearance of cells, e.g. size, borders and colours **D4.8** I can copy and paste formulae within a spreadsheet	**Curricular links** Maths – sorting numbers, shapes according to properties Science – sorting and classifying minibeasts, animals, trees etc.

Year 3: Communication	**Computing programme of study** – by the end of KS2 pupils should be taught to: • understand the opportunities the internet offers for communication and collaboration • select, use and combine a variety of software on a range of digital devices to create content	
Objectives **Word processing:** **C3.1** I can use cut, copy and paste to reorder content **C3.2** I can use and resize graphics within my work **C3.3** I can use spell check to aid my writing **Presentations:** **C3.4** I can type text and insert images onto pages **C3.5** I can add text effects and move items around to find the best layout **Online collaboration:** **C3.6** I can send and reply to online messages, such as email, respectfully **C3.7** I can add and open attachments **C3.8** I know not to open messages and attachments from strangers	**What this looks like** • Produce documents with increasing confidence using text and images, formatting and editing tools • Create presentations incorporating text and images. Start to add effects but consider audience and appropriateness of different effects • Know how to email, add and open attachments • Know how to remain safe when using email and when it is appropriate not to open emails or attachments • Send and receive emails purposefully e.g. to share information with link school • Write emails with an appropriate and respectful tone, and understand the difference between online and face-to-face	**Resources** **Software**: Word, 2publish+, Publisher, PowerPoint, 2create, **Apps**: Pages, Prezi, Keynote, MS Office, Explain Everything, Book Creator, Comic Life **Online**: Prezi, Purple Mash, Email, Skooville, ThinkUKnow, ChildNet **Other resources**: ICT framework v5 Y3 and Y4 Communication, Rising Stars MS Office unit 4; SWGfL Digital Literacy & Citizenship
Year 2 Objectives **Word processing:** **C2.1** I can edit and improve my work by changing, adding or removing words **C2.2** I can change the font size, colour and style to change my work	**Year 4 Objectives** **Word processing:** **C4.1** I can different layouts and effects (such as text box, columns, tables, justification, borders, background colour) to refine and improve my work **Presentations:** **C4.2** I can add a background colour to improve my work **C4.3** I can add slide transitions and animation effects **Online collaboration:** **C4.4** I know how and why to keep my personal information private **C4.5** I can display myself appropriately online, e.g. avatar, code name **C4.6** I can act appropriately & respectfully online **C4.7** I know how to deal with cyberbullying	**Curricular links** Produce range of documents linked to topics and share with wider audience Link to persuasive writing with product websites that encourage you to buy products

Year 3: Digital Literacy & Research	**Computing programme of study** – by the end of KS2 pupils should be taught to: • use search technologies effectively • use technology safely, respectfully and responsibly	
Objectives **Research:** **R3.1** I can type in a URL to find a website **R3.2** I can search online for images and information safely **R3.3** I can talk about the reliability of information on the internet **E-safety:** **R3.4** I can present the information I have found and share it with others **R3.5** I know why we need to keep passwords safe and secure	**What this looks like** • Navigate the internet with increasing confidence to find information and images safely • Know that a web address is also called a URL – unique resource locator, i.e. a unique address to find a website • Know that not all information found on the internet is accurate, and why this might be so • Use information found on internet for a purpose, and share with others – do not just copy and paste information found, but use it to write their own text	**Resources** **Online:** Espresso, One Key, internet, email **Other resources**: ICT framework v5 Y3 Research; SWGfL Digital Literacy & Citizenship
Year 2 Objectives **Research:** **R2.1** I can find out facts by navigating websites **R2.2** I know each website has a unique address **R2.3** I can navigate to a website via favourites and typing in address **R2.4** I know not all the information found on the internet will be accurate or useful **R2.5** I can use a search engine to find facts using key word search **E-safety:** **R2.6** I know what to do if I find something inappropriate online, & where to go for help **R2.7** I know how to stay safe by going to appropriate websites **R2.8** I know that the messages or images I put online leaves a trail **R2.9** I know how to behave safely and respectfully online	**Year 4 Objectives** **Research:** **R4.1** I can use more complex search criteria to narrow down my search **R4.2** I know that not all websites are accurate and can check information using a different site **R4.3** I can make notes from information found on websites to present my findings **R4.4** I know what plagiarism is and when I can use the work of others	**Curricular links** Find information purposefully linked to topic work and other subjects, e.g. Geography link with school in a different country to compare locality

Year 3: Multimedia	**Computing programme of study** – by the end of KS2 pupils should be taught to: • select, use and combine a variety of software on a range of digital devices to create content	
Objectives **Creating images:** **M3.1** I can use the print screen function to capture an image **M3.2** I can select and use a certain area of an image **Video:** **M3.3** I can zoom in and out on subjects appropriately **M3.4** I can download the video files from the video camera **M3.5** I can combine video clips to create a video **M3.6** I can add simple titles and credits **Audio:** **M3.7** I can re-record an audio recording to improve clarity **M3.8** I can download and save a recording	**What this looks like** • Use print screen to capture an image that has been created or website navigated to • Paste image into paint software so a part of the image can be selected and used for different purpose, e.g. instructions to use a piece of software, how to play a game • Plan a 30 second TV advert for given product • Shoot video clips and combine to create advert • Perform simple editing of clips and add title and credits • Record radio advert for given product, re-recording excerpts if needed • Record poems for class anthology	**Resources** **Hardware**: digital camera, digital video camera, sound recorder, microphone, mobile device inbuilt camera and microphone **Software**: Colour Magic, Paint, Paint.net, 2paint a picture, 2photo simple **Apps**: iMovie
Year 2 Objectives **Photography:** **M2.1** I can discuss the quality of my images and make decisions e.g. delete a blurred image **M2.2** I can use a photograph within a document **M2.3** I can combine a set of photographs to tell a story **Video:** **M2.4** I can capture video **M2.5** I understand the need to frame the image and move the camera carefully **M2.6** I can play back a video recording	**Year 4 Objectives** **Creating images:** **M4.1** I can group, copy and move shapes within a picture **M4.2** I can order shapes / images by sending them to the back / front **Photography:** **M4.3** I can crop and / or rotate an image where needed **M4.4** I can adjust the colours on a photo **Animation:** **M4.5** I can plan an animation using a storyboard **M4.6** I can shoot frames to combine into an animation **M4.7** I can edit an animation to improve it / make it more realistic **M4.8** I can put sounds over an animation **M4.9** I can add titles and photos into an animation **M4.10** I can plan and create an animation for a given purpose	**Curricular links** Link with Literacy topics – persuasive writing

Year 4: Programming	**Computing programme of study** – by the end of KS2 pupils should be taught to: • design, write and debug programs that accomplish specific goals • use sequence, selection and repetition in programs; work with variables and various forms of input and output	
Objectives **Programming:** **P4.1** I can use if…then command within a series of instructions **P4.2** I can test existing programs to see how they could be improved **P4.3** I can write a program for a specific purpose, incorporating features such as inputs, repetition and procedures	**What this looks like** • Investigate existing programs, evaluating them and consider how they could be improved • Design and write a program / game / animation for a given purpose including specific programming features	**Resources** **Software**: Scratch, Coco **Apps**: Hopscotch **Online**: Espresso Coding, Sherston, Scratch2, Snap **Other resources**: ICT framework v5 Y5 Control, Rising Stars Computing 3.1 (Animation with Scratch)
Year 3 Objectives **Programming:** **P3.1** I can refine a program by using the repeat command **P3.2** I can create a procedure (group of commands) to do a specific task, draw a specific shape **P3.3** I can solve problems by breaking them into smaller parts **Simulations:** **P3.4** I can explain how to control a simulation **P3.5** I can explain how a simulation is and isn't realistic	**Year 5 Objectives** **Programming:** **P5.1** I can plan and test my algorithms and programs, detecting and correcting errors as needed **P5.2** I can use variables in programs **P5.3** I can design and write a program that controls or simulates physical systems and sensors	**Curricular links** Animation could be linked with Science concept Link with Literacy

Year 4: Data	**Computing programme of study** – by the end of KS2 pupils should be taught to: • select, use and combine a variety of software to create content including collecting, analysing, evaluating and presenting data and information	
Objectives **Graphs:** **D4.1** I can present data in a graph, selecting the most appropriate layout **D4.2** I understand the difference between discrete and continuous data **D4.3** I can answer questions relating to graphs, and pose my own questions **D4.4** I can use my graph in a document / presentation to share findings with others **Spreadsheets:** **D4.5** I can add text and numbers to spreadsheet cells **D4.6** I can add simple formulae: +-*/ **D4.7** I can change the appearance of cells, e.g. size, borders and colours **D4.8** I can copy and paste formulae within a spreadsheet	**What this looks like** • Present sets of data in different graphical forms, discussing and evaluating which layout is best • Discuss appropriate use of layouts for discrete and continuous data • Ask and answer questions relating to graphs – discuss the purpose of graphs • Share graphs via document, sharing findings from graph to show understanding • Start to explore spreadsheets by using existing ones to see how they can be changed and used • Add text and numbers and insert simple formulae • Test formulae by changing numbers in cells – does the result change too? • Format text within a spreadsheet – link to formatting text in other software	**Resources** **Software**: Starting graph, Excel, LogIT Lab **Apps**: Numbers **Other resources**: ICT framework Y4 Handling data, Y5 Modelling & simulations
Year 3 Objectives **Databases:** **D3.1** I can create a branching database to sort and organise items **D3.2** I can filter and sort records in a database to answer questions **D3.3** I can design a questionnaire to collect information, and display the information in a graph or table	**Year 5 Objectives** **Databases:** **D5.1** I can interrogate a database using more complex searches **D5.2** I can design and create a database **D5.3** I can use information in a database to create a graph in order to answer questions **Spreadsheets:** **D5.4** I can use simple functions, e.g. SUM, AVERAGE, to solve problems **D5.5** I can use brackets to organise formulae **D5.6** I can change data in a formula to answer 'What if?' questions **D5.7** I can change the format of cells appropriately **D5.8** I can create a graph using spreadsheet data	**Curricular links** Maths – graphs, formulae for solving problems, finding area of shapes Science – graphs to display results from experiments

Year 4: Communication	**Computing programme of study** – by the end of KS2 pupils should be taught to: • understand the opportunities the internet offers for communication and collaboration • use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact	
Objectives **Word processing:** **C4.1** I can different layouts and effects (such as text box, columns, tables, justification, borders, background colour) to refine and improve my work **Presentations:** **C4.2** I can add a background colour to improve my work **C4.3** I can add slide transitions and animation effects **Online collaboration:** **C4.4** I know how and why to keep my personal information private **C4.5** I can display myself appropriately online, e.g. avatar, code name **C4.6** I can act appropriately & respectfully online **C4.7** I know how to deal with cyberbullying	**What this looks like** • Produce documents and presentations with increasing competence, incorporating different layouts and effects as appropriate, showing an awareness of audience • Produce newspaper / leaflet • Create documents and presentations to share information with others – for a purpose • Share information with link class in another school to find out about a different locality • Contribute to a class / school blog • Be aware of safety issues relating to online collaboration • Explain why using avatar and online name is advisable	**Resources** **Software**: Word, 2publish+, Publisher, 2create, PowerPoint, Comic Life **Online:** www.prezi.com, www.wordle.net (use with caution as some inappropriate content), Skooville, ThinkUKnow, ChildNet **Apps**: Pages, Keynote, Prezi, Comic Life **Other resources**: ICT framework Y4 Communication; SWGfL Digital Literacy & Citizenship
Year 3 Objectives **Word processing:** **C3.1** I can use cut, copy and paste to reorder content **C3.2** I can use and resize graphics within my work **C3.3** I can use spell check to aid my writing **Presentations:** **C3.4** I can type text and insert images onto pages **C3.5** I can add text effects and move items around to find the best layout **Online collaboration:** **C3.6** I can send and reply to online messages, such as email, respectfully **C3.7** I can add and open attachments **C3.8** I know not to open messages and attachments from strangers	**Year 5 Objectives** **Word processing:** **C5.1** I can develop consistency across the document **Presentations:** **C5.2** I can add multimedia elements, e.g. sounds, animation **C5.3** I can trigger animations or link to other slides when objects are pressed **Online collaboration:** **C5.4** I understand that information I put online leaves a trail, or digital footprint **C5.5** I know how and why to create secure passwords for online accounts **C5.6** I know what spam is, and how to deal with it	**Curricular links** History – presentation showing key aspects learnt Geography – documents / presentation telling their partner school about local area Literacy – newspapers and leaflets

Year 4: Digital Literacy & Research	**Computing programme of study** – by the end of KS2 pupils should be taught to: • use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	
Objectives **Research:** **R4.1** I can use more complex search criteria to narrow down my search **R4.2** I know that not all websites are accurate and can check information using a different site **R4.3** I can make notes from information found on websites to present my findings **R4.4** I know what plagiarism is and when I can use the work of others	**What this looks like** • Research information linked to topic work • Be aware that the more accurate the search term, the more relevant the results • Check information found on one website against another to verify results • Summarise information found and present in own words – not just copy and paste from website	**Resources** **Online**: internet searches, different search engines **Other resources**: ICT framework Y4 and Y5 Research; SWGfL Digital Literacy & Citizenship
Year 3 Objectives **Research:** **R3.1** I can type in a URL to find a website **R3.2** I can search online for images and information safely **R3.3** I can talk about the reliability of information on the internet **E-safety:** **R3.4** I can present the information I have found and share it with others **R3.5** I know why we need to keep passwords safe and secure	**Year 5 Objectives** **Research:** **R5.1** I know the information found on some sites will be biased **R5.2** I know that images and text found on websites is subject to copyright **R5.3** I know how to credit the use of websites in my work, and why this should be done **E-safety:** **R5.4** I know different ways of reporting concerns about content	**Curricular links** Link to communication – create documents and presentations with information found from research

Year 4: Multimedia

Computing programme of study – by the end of KS2 pupils should be taught to:

- 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

Objectives

Creating images:
M4.1 I can group, copy and move shapes within a picture
M4.2 I can order shapes / images by sending them to the back / front
Photography:
M4.3 I can crop and / or rotate an image where needed
M4.4 I can adjust the colours on a photo
Animation:
M4.5 I can plan an animation using a storyboard
M4.6 I can shoot frames to combine into an animation
M4.7 I can edit an animation to improve it / make it more realistic
M4.8 I can put sounds over an animation
M4.9 I can add titles and photos into an animation
M4.10 I can plan and create an animation for a given purpose

What this looks like

- Using vector based software create a design or logo by grouping and copying sections of an image
- Design a garden plan by grouping and repeating sections of an image or design, ordering shapes as needed
- Take photos for product design e.g. to accompany the game they have programmed. Adjust the colours to given different effects and edit the photos
- Plan out and create an animation to retell a story / for an advert. Edit and improve the animation by adding sounds and titles

Resources

Hardware: digital camera or web cam, in-built camera on tablet
Software: Aspex Draw, Textease Draw, 2draw, 2photo simple, Paint.net, 2animate, I can animate
Apps: LEGO movie maker, iMotion, I can animate
Other resources: ICT framework Y3, Y4 and Y5 Communication, Y4 Modelling and simulations

Year 3 Objectives

Creating images:
M3.1 I can use the print screen function to capture an image
M3.2 I can select and use a certain area of an image

Video:
M3.3 I can zoom in and out on subjects appropriately
M3.4 I can download the video files from the video camera
M3.5 I can combine video clips to create a video
M3.6 I can add simple titles and credits

Audio:
M3.7 I can re-record an audio recording to improve clarity
M3.8 I can download and save a recording

Year 5 Objectives

Creating images:
M5.1 I can add and combine shapes to design a 3D model
M5.2 I can add detail to my 3D model
Photography:
M5.3 I can improve a photo with editing tools e.g. blur, filters, add border
Video:
M5.4 I can edit the video; trimming and re-ordering clips
M5.5 I can add a voice-over and / or background music to a video
M5.6 I can add titles and credits to my video
Audio:
M5.7 I can create an audio recording and add it to other software

Curricular links

Design & technology / art – design a product box or logo
Literacy – animation to retell story, or advert linked to persuasion

<table>
<tr><td>Year 5: Programming</td><td colspan="2">Computing programme of study – by the end of KS2 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</td></tr>
<tr><td>Objectives
Programming:
P5.1 I can plan and test my algorithms and programs, detecting and correcting errors as needed
P5.2 I can use variables in programs
P5.3 I can design and write a program that controls or simulates physical systems and sensors</td><td>What this looks like
Design and create a game incorporating variables, testing and correcting errors as they go
Design and write a program linked to physical systems and sensors e.g. the light goes on when the light level drops, or the alarm goes off when a burglar opens the door</td><td>Resources
Hardware: control box and sensors
Software: CoCo, Scratch, Lego Mindstorms, LogIT
Apps: ALEX
Online: Espresso Coding, 2code, Scratch2, Snap
Other resources: ICT framework Y5 Control, Code Club Scratch Level 1 resources</td></tr>
<tr><td>Year 4 Objectives
Programming:
P4.1 I can use if…then command within a series of instructions
P4.2 I can test existing programs to see how they could be improved
P4.3 I can write a program for a specific purpose, incorporating features such as inputs, repetition and procedures</td><td>Year 6 Objectives
Programming:
P6.1 I can design and create a game, app and / or model, incorporating variables and different forms of input and output
P6.2 I can test, debug and modify a program to improve it</td><td>Curricular links
Design & technology – build a burglar alarm
Science – data loggers</td></tr>
</table>

Year 5: Data	**Computing programme of study** – by the end of KS2 pupils should be taught to: • use search technologies effectively • select, use and combine a variety of software to create content including collecting, analysing, evaluating and presenting data and information	
Objectives **Databases:** **D5.1** I can interrogate a database using more complex searches **D5.2** I can design and create a database **D5.3** I can use information in a database to create a graph in order to answer questions **Spreadsheets:** **D5.4** I can use simple functions, e.g. SUM, AVERAGE, to solve problems **D5.5** I can use brackets to organise formulae **D5.6** I can change data in a formula to answer 'What if?' questions **D5.7** I can change the format of cells appropriately **D5.8** I can create a graph using spreadsheet data	**What this looks like** • Solve problems by interrogating database to find answers e.g. solve crimes for Sherlock Holmes • Investigate online databases e.g. iTunes, IMDB.com, estate agents databases • Design and create own database e.g. favourite actors and films, TV programmes and actors, football teams and players / managers, countries and key features / things of interest • Create graphs from databases • Create more complex spreadsheets to model mathematical problems and to solve real life problems e.g. budgeting or funding a class trip • Solve given problems by creating spreadsheets, including creating graphs from data	**Resources** **Software**: Information Magic, Textease database, Excel **Online**: rightmove.co.uk, imdb.com **Other resources**: ICT framework Y5 Handling data and Modelling & simulations; Top Trumps cards (for database ideas)
Year 4 Objectives **Graphs:** **D4.1** I can present data in a graph, selecting the most appropriate layout **D4.2** I understand the difference between discrete and continuous data **D4.3** I can answer questions relating to graphs, and pose my own questions **D4.4** I can use my graph in a document / presentation to share findings with others **Spreadsheets:** **D4.5** I can add text and numbers to spreadsheet cells **D4.6** I can add simple formulae: +-*/ **D4.7** I can change the appearance of cells, e.g. size, borders and colours **D4.8** I can copy and paste formulae within a spreadsheet	**Year 6 Objectives** **Spreadsheets:** **D6.1** I can design and create a spreadsheet for a specific purpose, incorporating different features of design and function	**Curricular links** Science – database on the solar system Maths – budgets, investigations relating to area and perimeter

Year 5: Communication

Computing programme of study – by the end of KS2 pupils should be taught to:

- understand the opportunities the internet offers for communication and collaboration

Objectives

Word processing:
C5.1 I can develop consistency across the document

Presentations:
C5.2 I can add multimedia elements, e.g. sounds, animation
C5.3 I can trigger animations or link to other slides when objects are pressed

Online collaboration:
C5.4 I understand that information I put online leaves a trail, or digital footprint
C5.5 I know how and why to create secure passwords for online accounts
C5.6 I know what spam is, and how to deal with it

What this looks like

- Produce documents and presentations with a common theme, to provide consistency of font and style
- Show an awareness of audience
- Be able to produce presentations with multimedia elements, and with slides in a non-linear design e.g. buttons to give options within the presentation
- Produce a presentation that acts as a branching database to classify a set of items
- Send and receive emails, being wary of spam and how to deal with it
- Know that information posted online leaves a digital footprint and be aware of potential consequences of this – conduct themselves appropriately online

Resources

Software: Word, PowerPoint, Publisher, Prezi
Apps: Pages, Keynote
Online: class / school blog, school VLE
Other resources: ICT framework Y6 Communication; Rising Stars MS Office 4.1 (PPT for branching database); SWGfL Digital Literacy & Citizenship

Year 4 Objectives

Word processing:
C4.1 I can different layouts and effects (such as text box, columns, tables, justification, borders, background colour) to refine and improve my work

Presentations:
C4.2 I can add a background colour to improve my work
C4.3 I can add slide transitions and animation effects

Online collaboration:
C4.4 I know how and why to keep my personal information private
C4.5 I can display myself appropriately online, e.g. avatar, code name
C4.6 I can act appropriately & respectfully online
C4.7 I know how to deal with cyberbullying

Year 6 Objectives

Word processing:
C6.1 I can discuss and evaluate my documents, and make amendments as needed

Presentations:
C6.2 I can create a consistent design for my presentation, and present to others

Online collaboration:
C6.3 I know that some websites have age restrictions, and why these might be in place
C6.4 I can describe the opportunities computer networks and the internet offer for communication and collaboration
C6.5 I know different ways to report concerns about content & contact

Curricular links

Documents and presentations linked to a variety of topics
Science - 'Branching database' presentation e.g. linked to minibeasts

<table>
<tr><td>Year 5: Digital Literacy & Research</td><td colspan="2">Computing programme of study – by the end of KS2 pupils should be taught to:
use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact</td></tr>
<tr><td>Objectives
Research:
R5.1 I know the information found on some sites will be biased
R5.2 I know that images and text found on websites is subject to copyright
R5.3 I know how to credit the use of websites in my work, and why this should be done

E-safety:
R5.4 I know different ways of reporting concerns about content</td><td>What this looks like
Use the internet to productively search for information and resources to support work in other subjects
Understand that some sites will be biased e.g. newspapers with political stance
Be aware of copyright and modify searches to retrieve images that can be used under Creative Commons licence e.g. copyright free or able to use in Education for non-profit
Produce a list of websites as reference for work produced
Know how to report concerns about websites or contact from strangers</td><td>Resources
Online: different search engines, copyrightsandwrongs.nen.gov.uk, newspaper websites, thinkuknow.co.uk
Other resources: ICT framework Y5 Research; Espresso, SWGfL Digital Literacy & Citizenship</td></tr>
<tr><td>Year 4 Objectives
Research:
R4.1 I can use more complex search criteria to narrow down my search
R4.2 I know that not all websites are accurate and can check information using a different site
R4.3 I can make notes from information found on websites to present my findings
R4.4 I know what plagiarism is and when I can use the work of others</td><td>Year 6 Objectives
Research:
R6.1 I understand how computer networks work, including the internet
R6.2 I understand the difference between the internet and an internet service, e.g. the world wide web, VOIP
R6.3 I can use search engines effectively, and I know how search results are selected and ranked</td><td>Curricular links
Link research to subject being studied</td></tr>
</table>

Year 5: Multimedia

Computing programme of study – by the end of KS2 pupils should be taught to:

- 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

Objectives

Creating images:
M5.1 I can add and combine shapes to design a 3D model
M5.2 I can add detail to my 3D model
Photography:
M5.3 I can improve a photo with editing tools e.g. blur, filters, add border
Video:
M5.4 I can edit the video; trimming and re-ordering clips
M5.5 I can add a voice-over and / or background music to a video
M5.6 I can add titles and credits to my video
Audio:
M5.7 I can create an audio recording and add it to other software

What this looks like

- Make a 3D model of product
- Design and make a poster to advertise product
- Manipulate photos and consider creative aspects as well as the power to distort our perceptions of beauty and health, e.g. air-brushing photos in magazines (Dove Evolution video http://www.youtube.com/watch?v=iYhCn0jf46U)
- Create video for an advert – linked to persuasive writing (and websites) and photo alteration / advert product
- Create a weather report / 'outside broadcast' report from different location using green screen
- Create a backing track for news report / video

Resources

Hardware: digital camera or web cam, inbuilt camera on tablet
Software: Sketchup (http://www.sketchup.com/products/sketchup-make), Aspex Draw, Photo Simple, Paint.net, pixlr.com, www.befunky.com, Movie Maker, Audacity, Podium
Apps: iMovie, Do Ink green screen, Garage Band
Other resources: Magazines / videos with altered images; Rising Stars MS Office unit 5 (video)

Year 4 Objectives

Creating images:
M4.1 I can group, copy and move shapes within a picture
M4.2 I can order shapes / images by sending them to the back / front
Photography:
M4.3 I can crop and / or rotate an image where needed
M4.4 I can adjust the colours on a photo
Animation:
M4.5 I can plan an animation using a storyboard
M4.6 I can shoot frames to combine into an animation
M4.7 I can edit an animation to improve it / make it more realistic
M4.8 I can put sounds over an animation
M4.9 I can add titles and photos into an animation
M4.10 I can plan and create an animation for a given purpose

Year 6 Objectives

Photography:
M6.1 I can take photos for a given purpose and use them in my work

Animation:
M6.2 I can plan and create an animation for a given purpose
M6.3 I can edit an animation to improve it / make it more realistic
M6.4 I can combine an animation with other software

Multimedia overall:
M6.5 I can select and use appropriate multimedia tools, and combine these for a given purpose with confidence

Curricular links

Year 6: Programming	**Computing programme of study** – by the end of KS2 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	
Objectives **Programming:** **P6.1** I can design and create a game, app and / or model, incorporating variables and different forms of input and output **P6.2** I can test, debug and modify a program to improve it	**What this looks like** • Design, plan & create a more complex game / app with purpose and linked to topic / other subject	**Resources** **Software:** Scratch, Kodu, App builder, **Online**: Espresso Coding, Sherston **Other resources:** Rising Stars MS Office unit 6 (create & advertise computer game)
Year 5 Objectives **Programming:** **P5.1** I can plan and test my algorithms and programs, detecting and correcting errors as needed **P5.2** I can use variables in programs **P5.3** I can design and write a program that controls or simulates physical systems and sensors	**Key Stage 3 programme of study** • design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems • use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for • example, lists, tables or arrays]; design and develop modular programs that use procedures or functions • understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal]	**Curricular links**

<table>
<tr><td>Year 6: Data</td><td colspan="2">Computing programme of study – by the end of KS2 pupils should be taught to:
• select, use and combine a variety of software to create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</td></tr>
<tr><td>Objectives
Spreadsheets:
D6.1 I can design and create a spreadsheet for a specific purpose, incorporating different features of design and function</td><td>What this looks like
• Design a more complex spreadsheet model for a purpose, link to problem-solving skills</td><td>Resources
Software: Excel, 2calculate
Apps: Numbers
Other resources: ICT Framework Y6 Modelling & simulations</td></tr>
<tr><td>Year 5 Objectives
Databases:
D5.1 I can interrogate a database using more complex searches
D5.2 I can design and create a database
D5.3 I can use information in a database to create a graph in order to answer questions

Spreadsheets:
D5.4 I can use simple functions, e.g. SUM, AVERAGE, to solve problems
D5.5 I can use brackets to organise formulae
D5.6 I can change data in a formula to answer ‘What if?’ questions
D5.7 I can change the format of cells appropriately
D5.8 I can create a graph using spreadsheet data</td><td>Key Stage 3 programme of study
• understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem</td><td>Curricular links
Maths: budgets, financial planning</td></tr>
</table>

Year 6: Communication	**Computing programme of study** – by the end of KS2 pupils should be taught to: • understand the opportunities the internet offers for communication and collaboration • use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact	
Objectives **Word processing:** **C6.1** I can discuss and evaluate my documents, and make amendments as needed **Presentations:** **C6.2** I can create a consistent design for my presentation, and present to others **Online collaboration:** **C6.3** I know that some websites have age restrictions, and why these might be in place **C6.4** I can describe the opportunities computer networks and the internet offer for communication and collaboration **C6.5** I know different ways to report concerns about content & contact	**What this looks like** • Create documents and presentations for a variety of audiences and purposes, considering the appropriateness of text and formatting choices • Present their documents and presentations to others and consider improvements • Use a variety of online tools safely and with respect for others	**Resources** **Software:** Word, PowerPoint, 2create **Apps:** Pages, Keynote, Explain everything **Online:** Prezi **Other resources:** ICT Framework Y6 Communication
Year 5 Objectives **Word processing:** **C5.1** I can develop consistency across the document **Presentations:** **C5.2** I can add multimedia elements, e.g. sounds, animation **C5.3** I can trigger animations or link to other slides when objects are pressed **Online collaboration:** **C5.4** I understand that information I put online leaves a trail, or digital footprint **C5.5** I know how and why to create secure passwords for online accounts **C5.6** I know what spam is, and how to deal with it	**Key Stage 3 programme of study** • undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users • create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability • understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns.	**Curricular links** Variety of documents and presentations linked to other subjects.

<table>
<tr><td>Year 6: Digital Literacy & Research</td><td colspan="2">Computing programme of study – by the end of KS2 pupils should be taught to:
understand computer networks including the internet; how they can provide multiple services, such as the world wide web
use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</td></tr>
<tr><td>Objectives
Research:
R6.1 I understand how computer networks work, including the internet
R6.2 I understand the difference between the internet and an internet service, e.g. the world wide web, VOIP
R6.3 I can use search engines effectively, and I know how search results are selected and ranked</td><td>What this looks like
Research how networks and the internet etc. work
Create a presentation explaining how they work</td><td>Resources
Software: PowerPoint, Prezi
Online: search engines</td></tr>
<tr><td>Year 5 Objectives
Research:
R5.1 I know the information found on some sites will be biased
R5.2 I know that images and text found on websites is subject to copyright
R5.3 I know how to credit the use of websites in my work, and why this should be done

E-safety:
R5.4 I know different ways of reporting concerns about content</td><td>Key Stage 3 programme of study
understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits
understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns.</td><td>Curricular links
Research linked to different curriculum areas</td></tr>
</table>

Year 6: Multimedia

Computing programme of study – by the end of KS2 pupils should be taught to:

- 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

Objectives

Photography:
M6.1 I can take photos for a given purpose and use them in my work

Animation:
M6.2 I can plan and create an animation for a given purpose
M6.3 I can edit an animation to improve it / make it more realistic
M6.4 I can combine an animation with other software

Multimedia overall:
M6.5 I can select and use appropriate multimedia tools, and combine these for a given purpose with confidence

What this looks like

- Take photographs using filters and tools to enhance as required for given purpose
- Plan and create an animation to describe a scientific concept e.g. life cycle of frog, water cycle
- Combine animation, images and other documents to make electronic book for younger children
- Create a simple podcast

Resources

Hardware: digital camera, web cam, inbuilt camera from tablet
Software PowerPoint, Prezi, 2create
Online: pixlr.com, www.befunky.com, photosynth.net
Apps: BeFunky, Pixlr Express, Book Creator, I can animate

Year 5 Objectives

Creating images:
M5.1 I can add and combine shapes to design a 3D model
M5.2 I can add detail to my 3D model
Photography:
M5.3 I can improve a photo with editing tools e.g. blur, filters, add border
Video:
M5.4 I can edit the video; trimming and re-ordering clips
M5.5 I can add a voice-over and / or background music to a video
M5.6 I can add titles and credits to my video
Audio:
M5.7 I can create an audio recording and add it to other software

Key Stage 3 programme of study

- undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users
- create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability

Curricular links

Science – animation for scientific concept

Glossary

algorithm	an unambiguous procedure or precise step-by-step guide to solve a problem or achieve a particular objective
computer networks	the computers and the connecting hardware (wifi access points, cables, fibres, switches and routers) that make it possible to transfer data using an agreed method ('protocol')
control	using computers to move or otherwise change 'physical' systems. The computer can be hidden inside the system or connected to it
data	a structured set of numbers, representing digitised text, images, sound or video, which can be processed or transmitted by a computer
debug	to detect and correct the errors in a computer program
digital content	any media created, edited or viewed on a computer, such as text (including the hypertext of a web page), images, sound, video (including animation), or virtual environments, and combinations of these (i.e. multimedia)
information	the meaning or interpretation given to a set of data by its users, or which results from data being processed
input	data provided to a computer system, such as via a keyboard, mouse, microphone, camera or physical sensors
internet	the global collection of computer networks and their connections, all using shared protocols (TCP/IP - transmission control protocol/internet protocol) to communicate
logical reasoning	a systematic approach to solving problems or deducing information using a set of universally applicable and totally reliable rules
output	the information produced by a computer system for its user, typically on a screen, through speakers or on a printer, but possibly through the control of motors in physical systems
program	a stored set of instructions encoded in a language understood by the computer that does some form of computation, processing input and / or stored data to generate output
repetition	a programming construct in which one or more instructions are repeated, perhaps a certain number of times, until a condition is satisfied or until the program is stopped
search	to identify data that satisfied one or more conditions, such as web pages containing supplied keywords, or files on a computer with certain properties
selection	a programming construct in which the instructions that are executed are determined by whether a particular condition is met
sequence	to place programming instructions in order, with each executed one after the other
services	programs running on computers, typically those connected to the internet, which provide functionality in response to requests; for example, to transmit a web page, deliver and email or allow a text, voice or video conversation
simulation	using a computer to model the state and behaviour of real-world (or imaginary) systems, including physical and social systems; an integral part of most computer games
software	computer programs, including both application software (such as office programs, web browsers, media editors and games) and the computer operating system. The term also applies to 'apps' running on mobile devices and to web-based services
variables	a way in which computer programs can store, retrieve or change simple data, such as a score, the time left, or the user's name
World Wide Web	a service provided by computers connected to the internet (web servers), in which pages of hypertext (web pages) are transmitted to users; the pages typically include links to other web pages and may be generated by programs automatically

Computing in the national curriculum: A guide for primary teachers, page 27
Computing at school and Naace

Credits

The following documents have been used as reference material for this framework:

National Curriculum – Computing Programme of Study
https://www.gov.uk/government/publications/national-curriculum-in-england-computing-programmes-of-study

Computing in the national curriculum (A guide for primary teachers) – Computing at School
http://www.computingatschool.org.uk/index.php?id=primary-national-curriculum-guidance

Computer Science: A curriculum for schools – Computing at School Working Group
http://www.computingatschool.org.uk/index.php?id=cacfs

Naace and CAS Joint Guidance – 2014 National Curriculum for Computing
http://www.naace.co.uk/curriculum/guidance/jointnaacecasguidance

How to teach outstanding computing, and Computing Theory – Simon Haughton
http://www.simonhaughton.co.uk/

A Computing Curriculum for KS1 & 2 – Jon Chippindall
http://primarycomputing.co.uk/

Computer Science Unplugged
http://csunplugged.org/

South West Grid for Learning Digital Literacy scheme
http://www.digital-literacy.org.uk/Home.aspx

LBBD ICT Framework, version 4 & 5

The following subject leaders have contributed to the framework through curriculum workshops – many thanks ☺

Alan Robinson – Manor Longbridge
Amanda Fasham – Dorothy Barley Infants
April Gray – Monteagle Primary
Carrie Cox – Marks Gate Junior
Cassandra Manios – St Vincent's Primary
Catherine Cook – Beam Primary
Chibhon Hallowell – Marks Gate Infants
Fehmida Iqbal – Northbury Primary
Joanne Conneely – Henry Green Primary
Jon Filer – Beam Primary
Karen Macleod – Parsloes Primary
Kate Jensen – Becontree Primary
Kelly Baker – Manor Infants
Lenka Grymova – Gascoigne Primary
Mark Jobin – Warren Junior
Matt Taylor – William Bellamy Primary
Michael Pillay – Thames View Junior
Mohammed Islam – Manor Junior
Nasreen Butt – Five Elms Primary
Nico Heath – Southwood Primary
Nicola McKay – Roding Primary
Oliver Kelly – Thomas Arnold Primary
Rebecca Anthoney – St Peter's Primary
Sabiha Miah – Village Infants
Sarah Gibson – George Carey Primary
Stephen Hawke – Grafton Primary
Zairah Moughal – Northbury Primary