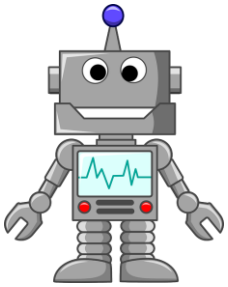
Ashton West End Primary Academy
Computing Curriculum – KS1

The Computing Curriculum

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.*

Computing in the Primary Curriculum – A Guide for Primary school Teachers by CAS NAACE



National Curriculum Computing programmes of study: 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.

Schemes Overview for KS1

Computer Science (CS)		**Programming, Coding and Controlling Devices** In this strand the pupils will explore computer programming and computational thinking in different contexts – they will relate this to the world around them: Pupils will learn what an algorithm is by writing instructions to solve problems. They will use a range of programmable devices such as a Bee-Bot, Pro-Bot. They will use simple block coding to write instructions and solve problems on screen. They will discuss their ideas and turn this into instructions the computer can understand. They will begin to understand that to write a program they will need to have clear ideas and clear instructions. • Talk how to solve problems with instructions on and off screen • Write instructions to solve given problems. Using these instructions (algorithms) to control devices or objects on screen. • Debug their instructions to improve or correct errors.
	Digital Literacy (DL)	**Digital Exploration** In this strand the pupils will explore finding information on the Internet safely: They will explore concepts such as where information and digital files are stored, who might create them and how they can find information in a safe and productive way. • Familiarisation with digital content, digital files and storage systems (school network, Wi-Fi at school/home, cloud networks, internet, media storage) • They will explore concepts of staying safe online • How to deal with inappropriate content
Digital Literacy (DL)		**Communicating and Collaborating** In this strand the pupils will explore communication and collaboration tools. They will consider the e-safety rules and how this keeps them safe at school but also consider them in a wider context. They will learn how to be a responsible in online communities. • Importance of keeping personal information private on the web • Tools used to communicate and collaborate – in school and beyond • Knowledge of the school e-safety policy
Information Technology (IT)		**Multimedia** In this strand the pupils will create multimedia content in different curriculum contexts: This unit relates closely to Digital Imagery, Music and Sound as well as Communicating and Collaborating • They will communicate their ideas using text, graphics and sound • Publish work collaboratively on a VLE/ learning platform for different audiences (Also see the strand Communicating Collaborating and Publishing)
		Digital Imagery Pupils will explore creating and making digital images in different contexts: • They will use a range of graphics, paint packages, cameras and capture devices, simple photo manipulation software, animation and filming. • They will also consider issues about sharing images with a wider audience
		Music and Sound Pupils will explore and create and make music and sound in different contexts : • They will explore digital musical instruments and recording devices – they will know how their sounds are stored and played back through different media • They will understand that their sound can be added to different software to create multimedia • They will learn to use different software to create, edit and manipulate sounds
		Collecting, Analysing, Evaluating and Presenting Data: Pupils will explore data in different contexts: They collect and represent data using charting software they will use data to answer questions • Use software to sort objects and represent data on screen • Use ICT to create pictograms, bar charts and tables to illustrate data for different purposes • Use the tools to sort and search the data to answer specific questions

KS1: Programming Coding and Controlling Devices (Computer Science)

Year Group	Year 1	Year 2
Learning Objectives	• Begin to understand that you need instructions to solve control problems e.g. to move a device from one place to another. These instructions form an **algorithm**, used to solve specific problems e.g. entered as sequences in a **programmable device** such as a BeeBot. • Understand that **programs** are executed by following precise and unambiguous instructions, known as **code** • Begin to understand that simple **programs** or **code** can be created and then the code can be **debugged** or edited if necessary	• Understand that **algorithms** are a set of instructions that solves specific problems. Know they can be used to program **digital** or **programmable devices** by following instructions or **code** • Create and write a **program** using precise and unambiguous instructions, understand that this is **coding** • Create and **debug** simple **code** • Use logical reasoning to predict the behaviour of simple **programs** or **code**
Teachers enable progress	• Talk about how **devices** respond to commands, demonstrate how remote devices use buttons to sequence commands • Set problem solving activities that require the children to sequence a list of commands using a programmable robot or toy to follow a route; this is an **algorithm** • Ask open questions to develop understanding, *"What would happen if we pressed this button twice?"* • Talk about how **programmable devices** and on-screen objects can be controlled by sequences of instructions or actions and that this is called **code** • Talk about how other software works by programming objects to do things e.g. when something is clicked on or a keyboard input is given; explore examples • Look at simple lines of instructions,(**code),** encourage them to make predictions about what the **code** does by testing and discussing • Show how planning, predicting and estimating helps to create a set of instructions that will control a **device** or object on screen and can be used to achieve a specific outcome • Talk about the application of **code** to other **devices** at school and in the world around them e.g. everyday **devices**, washing machines, traffic lights mobile phones, Apps etc.	

Children will …	• Explore a range of control toys and devices such as sound recording devices, music players, digital recording devices
	• Explore outcomes when individual buttons are pressed on a programmable device
	• Explore an on-screen character (or BeeBot) and navigate it around a course or grid. While navigating around a course on a computer, predict what will happen once the next command is entered.
	• Solve simple problems by following instructions to move objects on screen or devices in the classroom
	• Create a series of instructions to move their peers/toys around a course using simple planning aids e.g. a series of cards used to remember and recall the order of instructions (code)
	• Talk about how devices need instructions to work and talk about common devices in school and in the home
		• Talk about and demonstrate how everyday devices can be controlled through the use of remote control e.g. TV, DVD, cameras, projectors, automated doors and screens etc.
		• Use a series of cards or written instructions to plan and/or record the sequence of instructions, understand the need for precise language e.g. forward, backward, right, left, turn, angle
		• Through different cross curricular opportunities create a series of instructions to program objects to move, to solve specific problems.
		  ◦ Understand that this is coding
		  ◦ Talk about what each part of the code does
		  ◦ Ensure that by testing, any bugs in the code are resolved (debugging)
		• Discuss devices that have been programmed and need code such as domestic appliances, games, Apps in order to operate successfully

Lesson content (Exemplars)	• Children investigate a variety of programmable toys and how different buttons work • Children move an onscreen sprite around a course • Children make sequences of commands using themselves or a BeeBot, by using a map or chart more complex sequences can be investigated • Discuss the variety of programmable devices in school and at home	• Children are shown and compare the programmable equipment around school; photocopier, scanner, camera, washing machine, microwave, dishwasher and fax machine • More challenging sequences of commands are devised to move a programmable robot or screen turtle around a path. The need for precision in the programming code is demonstrated • Evaluation of sequences enables an understanding of the debugging process • A variety of programming software/games are made available for comparison
Resources	TES i-board tools, Purple Mash 2DIY, 2Go, BeeBots, Probots , Roamer Too, Espresso Coding. iOS Apps: Daisy the Dinosaur, Flobot, Cargobot	

KS1: Digital exploration (Digital Literacy and Computer Science)

Year Group	Year 1	Year 2
Learning Objectives	• Explore and share information from a variety of sources (including digital resources).	• Explore and share information from a variety of sources (including digital resources). • Use the Internet to find answers to questions, following straightforward lines of enquiry • Be aware of the school rules for accessing the internet • Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies • Recognise Common uses of technology beyond school
Teachers enable progress	• Explore a variety of resources on a topic including physical and digital forms e.g. books, web sites, TV etc. • Model how information can be used to answer specific questions • Reflect upon how some resources are more useful than others • Demonstrate the layout and key features of a web browser (such as Internet Explorer) to access the internet, web addresses, menu buttons etc. • Introduce the concept of a search engine to find answers to specific questions • Explain responsible internet use and the e-safety rules of the school - Discuss where to go for help and support when they have concerns about content including at home and school • Physically demonstrate that different types of digital files may be saved in different places; server, data centres (online and cloud), network drives, USB devices – discuss uses at home	
Children will	• Talk about their use of ICT and other methods to find information • Select the appropriate buttons to navigate given web sites or stored information • Begin to understand they have to abide by school rules on Internet safety e.g. only navigate to given pages • Begin to understand where their work is being stored	• Recognise that some information is more useful than others • Navigate using the key features of both a web page and a web browser (such as Internet Explorer) • Use given web based resources to find out answers to questions about a specific topic • Use a safe search engine (e.g. Kidrex) to find answers to specific questions • Understand the importance of abiding by school rules on Internet safety • Discuss where to go for help and support when they have concerns about content • Begin to manipulate information using copy and paste for a specific purpose and discuss the fact that both the picture and text actually belongs to someone else • Understand that information can be stored in many different places either locally or remotely
Lesson content (Exemplar)	• Children explore a given internet page to find out information about toys from the past • Children talk about their use of a talking book (fiction or non-fiction) • Find information in relation to a topic in both the library and on the Internet. • Visit the server room in school to see where their work is stored	• Find information in relation to a topic in both the library and on the internet • Compare the process of finding and the quality of information • Navigate around a website on toys from the past to find information about different toys • Copy and paste a picture that has been found by the teacher on the internet to create a booklet in 2Publish Plus • Create a list of good internet research rules
Suggested Resources	*Child centred websites on a variety of internet enabled devices, child safe internet search engines, school e-safety rules, word processor or VLE/learning platform page to paste information* *Key Resources can also be found through the SWGFL Digital Literacy Curriculum to support Key aspects of Safety and being a responsible digital citizen http://www.digital-literacy.org.uk/Home.aspx	

KS1: Communicating and Collaborating (Digital Literacy)

Year Groups	Year 1	Year 2
Learning Objectives	• Use passwords to access online resources and keep them private • Know messages can be sent electronically • Show awareness that information online can be seen by others • Know there are rules to keep them safe when accessing content online	• Use passwords to access resources and know why they need to keep them private • Know the school e-safety rules and know how to respond to inappropriate content • Show an awareness that information including images online can be shared at home, school and worldwide • Know private information should never be given out on the internet • Communicate their ideas with an invited group • Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies
Teachers enable progress	• Discuss and demonstrate e-safety in terms of the school acceptable use policy, using age-appropriate tools, such as "Hector the Protector", "Digi Duck". • Discuss and illustrate the sort of information that is private • Demonstrate the use of private logins and passwords to access content • Demonstrate and discuss vocabulary associated with electronic communication • Discuss how a range of electronic communication tools are used at school and home whilst following an agreed etiquette • Model collaboration on a class or group project • Show that many different people can communicate and publish online but that some content is not suitable for our use • Discuss how to respond whenever inappropriate material has been accessed. Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	
Children will ……	• Talk about and learn the school e-safety rules • Understand that the Internet can be a useful place but there is a need to be cautious. They learn that computers can be used to visit far-away places where they can learn new things • Staying safe online is similar to staying safe in the real world (SWGfL E-safety)* • Be confident in their response to doubtful or inappropriate internet content • Talk about how to communicate safely and respectfully using different technologies and tools • Work collaboratively, as a group or independently to communicate electronic information safely	• Create a resource to share the school's e-safety rules • Use passwords which are kept secret • Use internet sites to support their learning which have been previously monitored and checked by an adult • Talk about how to communicate safely and respectfully • Talk about e-safety rules where to go for help and support when they have concerns about content or contact on the Internet or other online technologies. • Work collaboratively or individually in order to share or request information • Make use of collaborative workspace such as a VLE/ learning platform to share content based on a topic or area of interest
Lesson content (Exemplar)	• *Use different forms of communicating in role-play areas such as telephones, mobiles, walkie-talkies etc.* • *Communicate electronically with a story character* • *Compose a class blog e.g., a diary of a tadpole, chick, caterpillar or class toy*	• *Contact children in another class/school to request information* • *Writing in role using a forum or blog e.g. to another class as fairy story characters* • *Contribute to a discussion about holidays in the past asking parents and grandparents to share and contribute* • *Use a forum to discuss with Year 3 moving to the Junior school* • *Use a blog tool to celebrate achievements at home and at school*
Suggested resources	*Walkie-talkies, toy mobile phones, digital recorders, , blogging software, 2Publish, 2Create a Story, word processor, VLE/ learning platform wiki,* *Key Resources can also be found through the SWGFL Digital Literacy Curriculum to support Key aspects of Safety and being a responsible digital citizen http://www.digital-literacy.org.uk/Home.aspx	

KS1: Multimedia (Information Technology)

Year Group	Year 1	Year 2
Learning Objectives	• Add text to graphics and use sound to communicate ideas • Know there are rules concerning staying safe online	• Create presentations for a specific audience • Refine their presentations • Children publish and share work online such as Purple Mash or through a VLE/learning platform • Know why there are e-safety rules and that these apply to all connected devices
Teachers enable progress by ….	• Provide cross curricular opportunities to enable familiarity with the keyboard and text editing • Model sound recording and add sound clips to stories, talk about the sounds and how appropriate they are within the context • Provide opportunities to combine text, sound and graphics using a variety of templates in order to support areas of the curriculum • Model the use of graphics animation in multimedia presentations and talk about how they may or may not enhance a presentation • Demonstrate the use of a template to produce a multimedia presentation or printed resource • Encourage creativity by setting a multimedia open ended task in order to enhance mood and atmosphere • Present the school e-safety rules and discuss their importance at school and at home	
Children will …	• Use keyboard spacebar, backspace, shift, enter, to provide text on screen that is clear and error free • Select or create appropriate images to illustrate cross-curricular work • Begin to select or record a sound to add to their work • Add text to photographs, graphics (images) and sound e.g. captions, labelling and simple sentences • Use pre-defined layouts or templates for presentations or published work (labels, books, stories etc) • Begin to explain why their choices have been made	• Develop basic editing skills including different presentational features (font size, colour and style) • Select from different presentational features e.g. title, paragraph, label etc. • Use appropriate editing tools to improve and correct their work • Make use of graphics, graphic animations and sound to enhance their work • Talk about their use of graphics and sound and how it may enhance or change the mood and atmosphere of their presentation and make changes where appropriate • Choose different layouts and templates for different purposes
Lesson content (Exemplar)	• Children photograph play or PE and they add a caption or voice recording • Children use a paint package to create a picture and annotate (e.g. Aboriginal art, labelling parts of a plant, body part labels, routes to school, plan a playground or classroom etc.) • Children sequence images for narrative or non-narrative writing (e.g. school incident, a route to school , life cycles, simple timeline)	• Children create an on-screen book about their visit to the shops • Children use digital images and text to tell the life story of Grace Darling or Florence Nightingale using the teacher's previously downloaded images • Children use text, photographs and maps to compare the local area to an island home
Suggested Resources	***Multimedia-authoring software**: Purple Mash Creative Tools: 2Publish, 2Publish Extra, 2Publish Projects, 2 Create a story, Touch typing packages; e.g. 2Type, PowerPoint, Clicker, Textease, paint package, digital camera/ camcorder, microphone and digital sound recorder, digital microscope, VLE/ learning platform, iPad and tablet Apps, Web 2 applications*	

KS1: Digital Imagery (Information Technology)

<table>
<tr><th>Year Group</th><th>Year 1</th><th>Year 2</th></tr>
<tr><td></td><td colspan="2">Using a variety of tools to create and manipulate an image (picture)
Know they can use devices to capture still and video images</td><td>Retrieve digital content, evaluate and make improvements
Use tools to share their ideas, experiences and imagination</td></tr>
<tr><td>Teachers enable progress by …</td><td colspan="2">Creating Images
Demonstrate a variety of tools in a graphics package to communicate a specific idea
Discuss and demonstrate the difference and advantage between a graphics package and paper based art activities
Capturing Images
Demonstrate that a variety of devices can capture images and contrast the differences between still and moving images
Use devices to capture images to share, store and retrieve; make use of these in other software e.g. camera, tablet or phone
Discuss the framing of an image or scene and how the impact of the image may be improved
Presenting Images
Show that images can be joined together to make a sequence
e- safety
Discuss online publication and e-safety rules of respect and safety (see Communicating and Collaborating and e-safety)</td></tr>
<tr><td>Children will ……</td><td>Graphics Packages
Use a paint package to create a picture using a variety of tools to communicate their ideas
Explore shape, line and colour to communicate a specific idea
Animate an image or screen using predefined animations (e.g. using 2Simple 2Create a Story)
Film and photo
Use a device to take a picture or record their work
Talk about the images or film they have taken and the tools used
Talk about how images can be shared and who might see them</td><td>Graphics Packages
Develop a variety of skills using a range of tools and techniques to communicate a specific idea or effect
Describe to others their reason for choice of tools and effects
Digital Imagery
discuss quality of their image and make decisions (e.g. delete a bad image)
edit and enhance photographs and pictures
Animation
Create a sequence of still images which together form a short animated sequence
Share their work online
Talk about who might see the images and what is safe to share – and with whom</td></tr>
<tr><td>Lesson content (Exemplars)</td><td>Example Cross Curricular links and outcomes
Use digital images and art packages to investigate the work of other artists
Use an art package to explore techniques (e.g. patterning, tiling, stamping)
Children design wrapping paper for Christmas or DT project</td><td>Use a simple animation package to show the growth of a seed
Children use a paint package and select appropriate images to produce maps, diagrams, charts and posters
Children use a hand held video camera or digital camera to record the acting out of story boards they have created</td></tr>
<tr><td>Suggested Resources</td><td colspan="2">Paint software 2Paint, 2Simple – 2Paint a Picture, Purple Mash: 2Paint, 2Animate, 2design and Make
A range of digital capture tools e.g. digital camera, tablet, other image capture devices, visualisers, microscope</td></tr>
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KS1: Music and Sound (Information Technology)

Year Group	Year 1	Year 2
Learning Objectives	• Know they can record sound using ICT that can be stored and played back • Locate, listen to, play and begin to record sounds • Use software to change the musical phrases they create	• Begin to understand that adding music and or a sound can affect mood and atmosphere of their work • Save, retrieve and add their own recorded sound to their presentations • Be familiar with the school's e-safety rules
Teachers enable progress – What teachers do	• Allow for pupil exploration with a range of devices which create and record sounds and musical phrases • Explain that devices have stop, record and playback functions • Explain that music software can be used to organise and reorganise musical phrases using icons • Demonstrate that sound features of programs can add to a pupil's work e.g. 2create a story	
Children will	• Explore a range of electronic music and sound devices including software and different peripherals • Talk about their music when they share their recordings with the rest of the class • Use software to explore sound and musical phrases, create and edit musical phrases for a specific purpose and talk about their choices	• Select and use devices for recording sound for a specific purpose e.g. Talking Tins, tape recorder, MP3 recorder, microphone and online • To know the risks involved when accessing resources from the Internet • Use software to explore sound and musical phrases, create edit and refine musical phrases for a specific purpose and talk about their choices • Exploring a range of sounds on an electronic instrument and choose appropriate sounds for a purpose • Use the sound features of programs to add to their work e.g. 2create a story
Lesson content (Exemplar)	• *Use sound recording devices to record sounds around the school and identify them* • *Use sound buttons in a program to hear sounds and link them to pictures* • *Compose a simple musical phrase to link with another curriculum area* • *Use the sound features of programs to add to their work* • *Children record their talk while in role as a topic-based or story character*	• *Children add sound effects to a poem to enhance performance* • *Children compose music to represent the seaside* • *Children use microphones and pre-recorded sounds to add narration to multimedia work e.g. 2Simple software* • *Children add sound clips to the school's VLE/learning platform describing a picture or an event at school* • *Children record a line of a poem to be shared online e.g. in a forum*
Suggested Resources	*Microphone, digital sound recorder e.g., TTS sound recording postcards, tins, buttons etc, programs with sound buttons, 2 Simple Music Toolkit, Purple Mash 2sequence, Busy Things Musical Monsters, The Dums, , electronic keyboard, electronic drums, 2create a story, Talking books, Talking pens, Karaoke machines, Dance mats, voice changers,* ***Sound resources*** *www.findsounds.com,*	

KS1 – Data Handling - Collecting, Analysing, Evaluating and Presenting Data (Information Technology)

Year Group	Year 1	Year 2
Learning Objectives	• Begin to understand that you can use software to represent data and information on screen • Understand that tools can be used to sort and illustrate the data in different ways • By selecting appropriate tools they can create a graph or chart to answer questions • Begin to understand they need to use a password to access different things on the computer, tablet or online	• Understand you can use graphing software to collect, illustrate, organise and classify data • Use graph plotting tools to answer appropriate questions concerning the plotted data • Understand the same data may be illustrated in a variety of ways • Understand they might use different passwords to access different systems (school network, home computer, Online resources) and they should keep them private
Teachers enable progress	• Develop opportunities to use ICT to solve sorting problems to consolidate practical activities such as sorting, classifying objects in to sets, hoops, boxes etc. • Demonstrate how ICT helps sorting and classifying data. Begin to recognise that ICT allows quick variation in how the data may be illustrated • Set problem solving activities that require the children to collect information about themselves or data specific to a topic, generate graphs and charts and answer simple questions • Discuss and illustrate what happens if data has not been entered accurately	
Children will	• Explore different ways of sorting objects on screen • Compare on screen activities with pencil and paper methods or sorting real objects • Create a pictogram to represent the data the class has collected on themselves or linked with a topic and use it to answer questions • Use a password to access information and know it needs to be kept safe	• Create pictograms, charts and graphs in a variety of curriculum contexts, adding labels and numbers as appropriate • Talk about how ICT helps them to organise their information, edit and make rapid changes • Use the sorting tool to help recognise patterns within data • Use charts and graphs to both create and answer questions • Use a password to access systems and talk about why they must not be shared • Know that some personal information must not be shared with others and that they need permission to make changes
Lesson content (Exemplars)	**Example Cross Curricular links and outcomes** • Table top activities with real objects sorted into hoops using a variety of criteria (colour, hard/soft, metal/non-metal, size etc.) • In a topic on Ourselves, children interpret a pictogram showing the types of houses people live in • Children use ICT to sort objects according into living or not living • Children talk about images of old and new toys sorting them on the screen	**Example Cross Curricular links and outcomes** • Children undertake a traffic survey and interpret the data as a pictogram • Children collect and analyse class based data about themselves (e.g. Our favourite fruits, eye or hair colour within science, DT, geography, or history) • Pictograms and charts are labelled by the children • Children collect information on school food preferences such as favourite snacks. This information is graphed and the children interpret and discuss the results • Collected data is illustrated differently but they understand although it looks different the data is the same
Suggested Resources	**Pictograph software** – Furbles, Purple Mash 2 Count, Smart Notebook **Simple Graphing software** such as 2Graph, Purple Mash.	

Ashton West End PrimaryAcademy Computing Curriculum
Lower KS2: Year 3 and Year 4

The Computing Curriculum

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. –*
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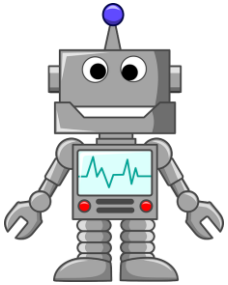

National Curriculum Computing programmes of study: Key stages 2

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.

Schemes Overview for Lower KS2 Years 3 and 4

NB Statements in red are specific to E-safety

<table>
<tr><td rowspan="2">Computer Science (CS)</td><td></td><td>Programming, Coding and Controlling Devices
Pupils will explore computer programming and computational thinking in different contexts – they will relate this to the world around them. The focus on algorithms (A set of instructions to solve a specific problem) at key stage 1 leads pupils into the design stage of programming. They use algorithms in the start of the process of creating working code, and identifying the steps needed to solve the different problems presented to them.
Pupils should have opportunities to explain the thinking behind their algorithms, talking through the steps and explaining why they've solved a problem the way they have. They also need to be able to look at a simple programming project and explain what's going on and debug when it doesn't work.
• Transfer skills to screen to program objects on screen using code – relevant to the given software
• Explain code in a program and debug to improve or correct errors
• Learn how to use variables in their code to change events e.g. changing the number of steps or size of angle and discuss consequences
• Learn how to be more efficient with code using repeat and loop commands to achieve specific outcomes
• Understand that objects can be controlled by other conditional inputs, "if the object hits a wall then.", "If object touches another object then ..."
• Solve problems by decomposing code into smaller parts by using procedures</td></tr>
<tr><td>Digital Literacy (DL)</td><td>Digital Exploration
Pupils will find effective ways of searching for information on the Internet and consider personal safety
They will explore concepts such as where information and digital files are stored, who might create them and how search engines find information. They will understand not all information is correct and plausible
• Familiarisation with digital content and storage systems (school network, Wi-Fi at school/home, cloud networks, internet, media storage)
• Staying safe online
• How to deal with inappropriate content
• Storing and retrieving digital content in different contexts
• Begin understanding search engine technologies and developing search techniques to refine searches for specific content</td></tr>
<tr><td>Digital Literacy (DL)</td><td></td><td>Communicating and Collaborating
In this strand the pupils will explore communication and collaboration tools. They will consider the e-safety rules and how this keeps them safe at school but also consider them in a wider context. They will learn how contributions online are stored and how to be a responsible member of online communities.
• Importance of keeping personal information private on the web
• Use a wide range of tools to communicate and collaborate online in different curriculum contexts
• Know the school e-safety policy and how to behave responsibly
• How to respond to online issues e.g. cyber-bullying
• Being a responsible member of a connected community</td></tr>
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Information Technology (IT)	**Multimedia** Pupils will create multimedia content in different curriculum contexts: This unit relates closely to Digital Imagery, Music and Sound as well as Communicating and Collaborating • Communicate ideas using text, graphics and sound • Publish work collaboratively on a VLE/ learning platform for different audiences (Also see the strand Communicating, Collaborating and Publishing) • Record and present information using a range of media for a particular audience • Be knowledgeable of the school's e-safety rules and adhere to them – In particular when using the Internet to find or link to resources • Consider good design features and specific layouts when creating media for print, multimedia or online presentation • Plan, design and style content for a presentation, combine a range of sources, considering the intended audience
	Digital Imagery Pupils will explore digital images in different contexts: • Use a range of graphics, paint packages to create different features and effects when creating different images • Use cameras and capture devices and import photo manipulation software to enhance mood or create different effects • Use animation and film creating and editing software to create as sequence to communicate a story or idea • They will also consider safe searching, copyright and privacy issues when sharing images with a wider audience
	Music and Sound Pupils will explore and create music and sound in different contexts • Explore digital musical instruments and recording devices – they will know how their sounds are stored and played back through different media • Understand that their sound can be added to different software to create multimedia • Learn to use different software to create, edit and manipulate sounds
	Collecting, Analysing, Evaluating and Presenting Data: Pupils will explore data in different contexts: They will explore data manipulation in different contexts, they will use charting software and databases to collect and present their data to support science, geography, maths D and T They will use data loggers or Apps on tablets to capture data. They will be introduced to simple spreadsheets to carry out calculations. • Represent data on screen using frequency charts, pictograms, bar charts and graphs for different purposes • Sort and search the data to answer specific questions • Use a variety of tools to collect data – Data loggers, weather stations, Apps on tablets, fitness related tools • Use the data collected to interpret, recognise patterns, describe events and answer questions • Consider the accuracy needed when collecting and storing data • Begin to develop knowledge about how data is used in the world around them how/where it is collected. They will also consider issues such as accuracy, privacy and keeping data safe • Use spreadsheets to develop an understanding of simple functions and create a simple budget

Lower KS2 Programming, Coding and Controlling Devices (Computer Science)

Year Group	Year 3	Year 4
Learning Objectives	• Write simple **algorithms** to accomplish specific goals using a **programmable device** or object on screen • Understand how a **program** may be broken down into smaller parts and that these are all part of the **code** • Understand a program can be changed through the use of variables e.g. changing the number of steps or size of angle • Use **repeat** and **loop** commands in **code** to achieve specific outcomes • Understand how a program can control **outputs,** illustrate using a flowchart to show how everyday devices work	• Design, write and **debug code** that accomplishes a specific goal • Understand the purpose of a **procedure** to shorten **code** writing • Write **code** to create, test and edit a **procedure** and then combine procedures to produce effects. Understand the effect of changing **values** within a procedure • Understand how inputs can be used in **coding** to control **outputs** • Understand that objects can be controlled by other **conditional inputs**, *"if the object hits a wall then…."*, *"If object touches another object then …."*
Teachers enable progress –	• Set different problem solving tasks to enable children to write, test and **debug code** • Give opportunities for interactions with games, simulations or Apps. Ask them to talk about the **code** and, *"What would happen if ……."* • Discuss how software and **devices** need a specific programming language known as **code. Coding** may make use of **flowcharts** or be icon based, both of which can be used to control **devices or write** software for a game or App. • Talk about and demonstrate how a long **code** may consist of a sequence of smaller parts. Demonstrate how sequences of **code** can be shortened or made more efficient through the use of **procedures**, **repeat** commands or **loops** • Discuss the need for accuracy in the order and **syntax** of commands especially as the **coding** becomes longer or more complex • Demonstrate the link between an input device such as a switch, sensor, variable or keyboard, the chosen effect on the output and how this link is part of the code • Explore conditional operations in the coding. Ask children to use the **If** conditional statement e.g. *"if an object meets a wall then….."* • Talk about how **programming** and **code** is used in the world around us	
Children will	• Solve open ended problems with a floor robot or an on-screen program • Investigate how everyday devices are controlled using inputs and outputs e.g. automatic doors, kettle, traffic lights, microwave oven • Draw flow diagrams, (**algorithms**), to show how everyday devices work (movement, sound, light etc.) • Explore **loops** and **repetitions** to shorten the code • Plan, create and **debug** more complex sequences of instructions to achieve a specific outcome • Explore conditional **If . . .** statements e.g. program an object to move until it touches or hits something then stops • Begin to explore **variables** such as values (time, change in length, angle, count, scoring system) • Understand that **outputs** can be controlled using **code**	• Create, test, edit, save their own code enabling the onscreen object to carry out a specific task by using conditional **If**, **repeats** and **loops** • Build sequences of instructions to create **code** to solve specific problems being aware of the need for accuracy • Draw more complex patterns using **repeats** and **loops** by shortening the **code** to create **procedures** • **Debug** my own **code** and the **code** of others • Explore changing values and using variables (time, change in length, angle, count, scoring system) • Investigate conditionals in coding by looking at examples such as, "*if input 1 is off then turn on output 3*" • Understand how **code** is used to control physical systems in the real world e.g. bar codes, cash machines, TV control and drink dispensers
Lesson content (Exemplars)	• Use Scratch, Logo or a programmable robot to draw 2D shapes using repeat commands • Investigate the result when particular values are changed such as the length of side of a triangle or steps across the screen • Create a simple animation on screen to allow objects to interact with each other • Create a game with a simple scoring system for catching objects • Make simple procedures so the code may be shortened e.g. "To Pentagon" in Logo for drawing a pentagon and use several procedures to produce a complex picture	• Investigate outputs using a control box and how the code may turn various outputs on and off e.g. traffic lights or lighthouse • Check the accuracy of codes by testing and evaluating the intended outcomes – de bug where necessary • Creating a game, link the scoring to If statements • Use coding to solve a particular problem e.g. create a chasing game using loops, repeats, conditional statements and procedures in the code
Resources	*Floor robot e.g. Probot, Roamer Too, screen sprite and backgrounds, 2DIY, Flowol with simple mimics, control box, Scratch and Pico board, Scratch 2.0 (online), Espresso Coding, Purple Mash 2 Code* *http://www.bbc.co.uk/programmes/b01r9tww* ***IOS APPS*** *- Cargo Bot, Daisy the Dinosaur, Kodable, Hopscotch, 2Code* – Purple Mash	

Lower KS 2: Digital Exploration (Digital Literacy and Computer Science)

Year Group	Year 3	Year 4
Learning Objectives	• Use the Internet safely to search and a find a range of information to answer questions • Understand there might be a variation in results when different combinations of words are entered into a search engine • Begin to adapt questions based on search results • Begin to understand the parts of a computer network internal to the school • Know what to do when inappropriate material appears on the screen	• Pupils search for and use information from a range of sources and make judgements about its usefulness when following straightforward lines of enquiry • Adapt questions based on search results • Know what to do when inappropriate material appears on the screen and think about the implications at home • Understand how to use search engines effectively by comparing the results when slightly different combinations of words are entered • Begin to understand the parts of a computer network, both internal and external to the school
Teachers enable progress	• Demonstrate simple searches to find specific information from a variety of web sites • Demonstrate that by changing the search key words they will affect the results returned • Illustrate that some results obtained from a search are more relevant than others and how searches are ranked and ordered • Understand that a search engine indexes pages and content – e.g. images • Explain that some search engines have restricted content for their benefit and that some can access a wider range of information • Develop an understanding that different parts of a web search page will have different priorities (adverts, paid for content, ranked lists) • Demonstrate a website has a unique address (a url, uniform resource locator) • Ensure children's understanding and use of school e-safety rules • Explain that anyone can be an author on the internet and that the accuracy and quality of the information depends on the author • Explain how the school's computers are connected together and what the main parts of the network do. Show how it connects to the wider world and the Internet.	
Children will	• Using safe search engines designed for children to find relevant information linked to their project • Select key words from a theme to consider how relevant each search term will be • Begin to discriminate with the words entered into a search engine • Begin to scan through search results and decide which is the most relevant result • Talk about and describe the process of finding specific information • Be confident in how to respond to inappropriate material on screen • Draw a diagram to show the school's Local area network how the computers and other devices are connected together and what the main parts of the network do.	• Scan through search results and decide which is the most relevant result, consider how some searches are ranked • Search, evaluate results, re-search for a particular piece of information through modifying the search terms • Understand that web sites have a specific address e.g. www.bbc.co.uk/ and understand that they can be copied and pasted to create hyperlinks • Be aware that web sites are not always accurate and that information should be checked before it is used • Be confident in how to respond to inappropriate material on screen and consider actions at home as well as school. • Draw diagrams to explain how the school network is connected to the Internet and computers beyond the school
Lesson content (Exemplar)	• Children have to discriminate which search results are relevant and which are irrelevant from a prepared set of results • Show children two pages - one that is relevant to the topic under discussion and the other with misleading information. Ask the children to discuss and decide which is best • Ask the children to write a description of the school with one piece of inaccurate information. Swap their descriptions and find inaccuracies.	• Ask children to search a particular piece of information but only allow them to type in two words. What words would they use? Each child can then change just one word to try and improve their results. • Discuss the implications of inaccurate information on a website
Suggested Resources	*Child centred websites on a variety of internet enabled devices, child safe internet search engines, school e-safety rules, word processor or VLE/ learning platform page to paste information* We recommend when planning this unit you refer to a Key Resource available through the SWGFL: http://www.digital-literacy.org.uk/Home.aspx	

Lower KS2: Communicating and Collaborating (Digital Literacy)

Year Groups	Year 3	Year 4

Learning Objectives	• Explain that passwords are used to log in to resources on the web and why these should be kept private • Understand there is an accepted behaviour when communicating in the real or virtual world • Share ideas responsibly with others using a range of tools • Compare and use different forms of communication, considering their advantages and disadvantages	• Demonstrate an understanding of the rules and possible implications of e-safety when collaborating on projects • Consider an intended audience and its implications when communicating • Use a greater range of tools to communicate and collaborate
Teachers enable progress	• Remind children of the importance of keeping personal information private and what is sensitive or personal information • Explain that online activity leaves a digital trail • Discuss "Digital Footprint" and that material once posted can be copied, shared or archived by others resulting in the original author losing control • Create opportunities for pupils to share and contribute ideas, respond to each other, to guests or other schools using online tools appropriately • Provide opportunities for children to communicate and collaborate considering quality and appropriateness of responses • Discuss the different ways in which people are connected online across the world	
Children will	• Know and follow the rules for using communication technologies safely • Discuss other methods of communication and the importance of appropriate behaviour and personal safety at home and school • Compare all the different forms of electronic communication on different devices, considering their advantages and disadvantages • Compose and respond to blogs, forums etc. with their own ideas, considering audience and appropriate language and personal safety • Publish best pieces of work online. (When publishing, refer to the Multimedia Unit.)	• Discuss e-safety and how to keep safe when using online communications at home and at school and with an understanding of appropriate online etiquette • Embed other types of files into online spaces • Discuss and use a variety of forms of communication, considering their advantages and disadvantages. Consider audience and appropriate content • Reflect on the digital footprint left by an online activity • Use different forms of electronic communication (messaging, blogs, forums) whilst considering audience and style • Discuss how to be a responsible member of a connected community and how to deal with inappropriate content or cyberbullying
Lesson content (Exemplar)	• *In literacy, children use a forum for collaborative story writing, repetitive poem, character description or discussion* • *Use a forum or blog to add pictures of their view from a window with details of what their school is like.* • *To develop "ask an expert" discussions on a topic being developed in class* • *Answer a survey on books that they have read enabling them to contribute to a class book review* • *Hot seating on a forum: use a historical character in role, generate and ask questions* • *Collaborate with peers on a project to show learning on a specific topic e.g. flowering plants* • *Share art work for peer review*	• *Use a guest on the forum to find out about life in a city in India* • *Children contribute to a wiki on different aspects they have researched on a topic* • *Embed games, photo stories, videos on a VLE/ learning platform or web page* • *Share games they have created in coding projects for others to play* • *Collaborate on wiki pages, using text and images for a presentation of a topic work* • *Children use the forum tools for peer evaluation e.g. of their art work, music or poetry* • *Create a presentation about responsible use of social and online communities* • *Use drama to reflect on issues of cyberbullying and how they would react and cope* • *Sharing information on a Wiki - contributing to a locality study across a number of schools*
Suggested Resources	*Publishing software, VLE/ learning platform tools, Online Educational Community e.g. Edmodo, blogs, wikis, and forum tools* *Key Resources can also be found through the SWGFL Digital Literacy Curriculum to support Key aspects of Safety and being a responsible digital citizen http://www.digital-literacy.org.uk/Home.aspx	

Lower KS2: Multimedia (Information Technology)

Year Group	Year 3	Year 4
Learning Objectives	• Record and present information integrating an appropriate range of media for a given audience, combining text and graphics in a printable form • Know they can publish resources online to a given audience • Be knowledgeable about the school e-safety rules	• Design and create their own multimedia projects showing awareness of appropriate design and layout for their intended audience • Know they can publish resources online to a given audience or to the wider world understand the need to ensure it is appropriate and copyright free • Consolidate the school's e-safety rules
Teachers enable progress	• Compare and evaluate different multimedia, online and printed styles and designs to suit a variety of audience and publication types (newspaper, news web site, poster, menu, leaflet , shopping web page, magazine, e- book) • Provide a range of cross curricular projects where they can create content and understand different design features and layouts • Provide opportunities that consolidate and extend multimedia skills making use of peer evaluation to improve outcomes whilst thinking about their audience • Talk about the purposes of different types of printed or online media and what may make them persuasive or otherwise • Discuss the rules concerning appropriate use of materials from other sources especially copyright • Consolidate the school's e-safety rules	
Children will …..	• Recognise the difference and the advantages and disadvantages between electronic media and printed media • Combine text and graphics in different layouts, font formats, graphics and images for different purposes or audiences • Select suitable information from different sources and prepare it for processing in a multimedia presentation • Use appropriate editing tools to ensure their work is clear and error free using tools such as a spell checker and thesaurus • Begin to use hyperlinks to other resources and understand that outside sources must be checked by the teacher • Know the risks attached to seeking resources on the Internet in school • Discuss how they have developed design and layout features for a specific audience • Through peer assessment and self-evaluation, suggest suitable improvements	• Evaluate a range of electronic multimedia, appropriate to the task and audience. • Recognise key features of layout and design and discuss what makes a good design • Consider design and style features in their layout and select appropriate fonts, colour and features to suit the context • Select and import sounds, video clips and graphics to include in their presentations • Know the risks attached to seeking resources on the Internet • Be aware of copyright and plagiarism when creating presentations • Use hyperlinks to link to web pages or other pages whilst being aware of e-safety requirements • Through peer assessment and self-evaluation amend and improve work by considering style, purposes and audience and make necessary changes
Lesson content (Exemplar)	• Create a set of estate agent's details to sell a roman villa • Create, edit and illustrate shape poems • Write and present a newspaper article about evacuees in WWII • Create an on-screen guide about a local place of worship • Improve a deliberately faulty piece of multimedia • Create menus and posters for their cake sale • Create a story book for an infant child	• On a school trip children collect digital images, video, and sound samples and use these to produce a multimedia presentation fir peers in their class • Children create a cross-curricular explanation text on a geography topic with hyperlinks to further details • Create an e-book to illustrate a history topic to go in the library • Children make an audio recording of poems they have written and use them in a multimedia presentation for a presentation to parents
Suggested Resources	***DTP Tools*** *Purple Mash Creative Tools: 2Publish 2Publish Extra, 2Publish Projects, Word, Publisher, PhotoStory* ***Multimedia Authoring Tools:*** *2 Create a story, 2Create a Super Story, Clicker, Textease, Kar2ouche, PowerPoint, iPad and tablet apps, Web2 applications* ***Other Resources:*** *microphone and digital sound recorder, digital microscope, camera* ***Web and publishing*** *VLE/ learning platform*	

Lower KS2: Digital Imagery (Information Technology)

Year Group	Year 3	Year 4
Learning Objectives	• Select, manipulate and combine images using software to accomplish a task • Take and manipulate digital images using a range of devices beginning to take account of moods or ideas when framing and editing a shot. • Understand that images can be shared and viewed online and consider the privacy of themselves and others	• Combine and evaluate digital images taking account of the audience • Consider the quality of their work and their intended audience when creating animation, images or film • Discuss privacy in terms of using and sharing digital images
Teachers enable progress	• Provide opportunities to take digital images of a variety of subjects and discuss and evaluate the importance of different factors in the impact of the image on the audience e.g. format, landscape, portrait and framing • Show that films can create different moods and discuss the reasons for this e.g. factual, spooky • Model that evaluation and improvement is a vital part of a design process and that the technology enables quick and efficient editing • Show children how to search safely for images and how to report concerns • Discuss privacy and permissions in terms of using and sharing photographs	
Children will	**Graphics Packages** • Acquire, store and retrieve images from devices or Internet. Edit using paint packages or photo-manipulation software to change and manipulate an image (e.g. copy/paste/crop/make a stamp) • Talk about changes they can make to achieve a specific outcome • Through peer assessment and self-evaluation, evaluate and suggest suitable improvements **Digital Imagery** • Begin to take pictures or video thinking about the purpose of the image and recording- consider mood, aspect and framing • Make choices such as landscape and portrait using the enhanced tools • Discuss and evaluate the quality of their own captured images and make decisions (e.g. keep, delete, change) • Manipulate images to change the mood e.g. by changing colours or light levels • Use images or video clips in their multimedia unit • Build their awareness of sharing images online – consider what is personal and what might need permission **Animation** • Create a short animated sequence to communicate a specific idea.	**Graphics Packages** • To begin to enhance a presentation by acquiring, storing and retrieving images from different sources • Use paint packages or photo-manipulation software to change and manipulate an image appropriate to audience or task • Through peer assessment and self-evaluation, evaluate, suggest and make suitable improvements • Talk about their choices and changes they have made to achieve a specific outcome or purpose **Digital Imagery – Including Video** • Using devices to take pictures and video, thinking about the purpose of the image and controlling the device appropriately • Talk about different films and how they are directed to create different moods and effects • Plan (storyboard), edit, combine and still and moving images to create a short film or trailer. Add titles, credits and music • Understand how films are shared online consider the issues of appropriateness and privacy as they build their awareness of safe sharing online
Lesson content (Exemplar)	**Example Cross Curricular links and outcomes** • *Children take photographs of the "view through our window" and sequence/ annotate them to illustrate change* • *Children make a video of a weather forecast around the world* • *Use animation to illustrate the water cycle* • *Illustrate Literacy work on fantasy settings by manipulating an image,*	**Example Cross Curricular links and outcomes** • *Create pop-art style images by changing effects of a still image* • *Create a copy of a TV program to fit with other work (e.g. Weakest Link, Henry VIII's wives, historical "Through the Keyhole" or cookery programme)* • *Children create a persuasive trailer for a film*
Software/ hardware etc.	**Suggested Resources: Graphics:** *Paint.NET, 2Simple – 2Paint a Picture, Purple Mash: 2Paint, 2Design and Make* **Animation:** *2Animate,Puppet Pals app, Stop Motion app* **A range of digital capture tools:** *e.g.digital camera, tablet, other image capture devices, visualisers, microscope* **Video Editing***: Imovie, Windows Live Movie Maker* ***Sharing*** *their work on the VLE/learning platform*	

Lower KS2: Music and Sound

Year Group	Year 3	Year 4

Learning Objectives	• Understand that technology allows easy creation, manipulation and change • Select and use appropriate sound files to fit a given context • Know that sound files can be uploaded to the internet and shared across a wider audience	• Use music technology individually or as a group to create, develop, amend and present their ideas • Understand that evaluation and improvement is a vital part of a creative process • Use technology to compose music or sounds including creating melodies • Upload sound files to the internet to share with a wider audience
Teachers enable progress –	• Talk about software which allows easy manipulation and creation of sound and music • Insert music and sounds into other presentations talking about suitability of choices • Provide existing sound files for use in a presentation • Demonstrate how to use music or sound editing software to create, evaluate and improve a simple multipart composition • Explore the range of sounds from an electronic instrument for a specific audience • Discuss copyright when selecting music and sound • Teach how sound files can be uploaded to the internet in a relevant and safe context	
Children will	• Select and record voice and sounds e.g. tape recorder, Dictaphone, digital voice recorder, Talking Tins • Use music software to organise and reorganise musical phrases using icons to create a piece of music for a theme and talk about how technology enabled them to do so • Use sound editing tools to edit merge, sound effects and music to create a sound story	• Use music software to organise and reorganise musical phrases to create a piece of music for a theme • Record their voice and other sounds using the sound recording tool to add to their presentations or information • Use technology to combine and layer sounds to create sound stories or backing tracks • Share work on the internet for others to play and review • Know the school's e-safety rules and the risks involved when sharing resources on the Internet
Lesson content (Exemplar)	• *Children record speech and sound effects to accompany their writing e.g. to be played alongside* • *Add spoken French to a presentation/image (MFL)* • *Compose music or sound effects to accompany poems, stories, drama, dance* • *Compose music or sound effects to fit with a topic theme*	• *Pentatonic compositions to accompany images and film clips* • *Using music software that allows pupils to create and edit a melody (Music – Dragon Scales)* • *Use Audacity to record and perform a poem or play; add layers of voice, sound effects and music* • *Upload recording as podcasts onto a VLE/ learning platform to share with a wider audience* • *Children create a persuasive trailer for a film*
Suggested Resources	***Music composition software:*** *e.g. Black Cat Compose, Compose World, Notate, 2simple music toolkit* ***Online tools:*** *Purple Mash 2Sequence, Music creator ROC* ***Sound Manipulation:*** *Audacity (free, Podium* ***Sound Capture:*** *Microphone and digital sound recorder; electronic keyboard* ***Multimedia software:*** *to record sound straight into (e.g. 2Create a Super Story, Kar2ouche, PowerPoint, Photostory 3, VLE/ learning platform tools* *www.findsounds.com,*	

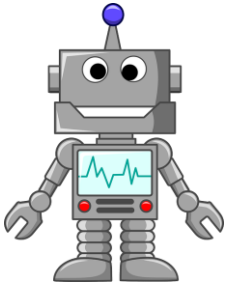
Lower KS2: Data Handling (Collecting, Analysing, Evaluating and Presenting Data)

Year Group	Year 3	Year 4
Learning Objectives	• Understand that collecting and organising information using ICT makes it easier to find answers to questions • Understand that ICT can be used to create pictograms, bar charts and tables that illustrate data for different purposes -using different scales with bar charts • Talk about their use of ICT and describe how it supports their learning • Know there is a variety of devices than can collect or capture data • Know data is collected and used in the world around them, and understand the need for keeping personal data safe	• Understand the importance of entering data correctly • Know that ICT can create different graph types for different purposes and some are more appropriate and easier to read than others • Understand the difference between a database and a spreadsheet. A database is a collection of information organised and presented to serve a particular purpose. A spreadsheet is used when we wish to do some calculations on the data held within it. • Know that personal data is stored on systems; understand the need to be accurate and keep it private
Teachers enable progress –	• Develop opportunities to use ICT to collect data including the use of data loggers and measuring Apps within cross curricula contexts • Demonstrate how they can use data to solve problems and answer questions through the use of different graph types and using a variety of scales • Set problem solving activities that require the children to collect data specific to a topic, use it to generate graphs and charts to both generate and answer questions • Model and discuss the need for accuracy and the possible implications if the data is entered incorrectly • Discuss where data is used in the world around them; how/where it is collected. Consider issues such as accuracy, privacy and keeping data safe • Model how a database works and how different types of data can be entered and stored within fields such as numbers, text, keywords or multiple choice items • Demonstrate using a spreadsheet with simple formula to illustrate how quick changes can be made to the data - such as listing prices in a shopping list. • Show how pre-defined formula can be used e.g. Sum to add columns or rows of numbers quickly • Outline the main differences between a database and a spreadsheet	
Children will …..	• Create frequency tables, pictograms and bar charts to illustrate results, annotate observations and answer questions related to the data • Collect data to solve a problem by choosing an appropriate graph to display their answers • Compare different charts and graphs and understand they are used for different purposes and that they may have different scales • Use data logger or measuring Apps to collect data. Explain how the device represents and records changes in data. Use data to see patterns, describe events and answer questions • Enter data into a pre-defined database use the information to answer a specific question • Use the data produced to answer specific lines of enquiry by sorting and creating bar charts or line graphs • Talk about how ICT can be used to create, present, organise and amend different types of data and how it automates the process • Know where different types of data can be stored e.g. schools, doctors, banks, shops, and that it needs to be kept safe with secure passwords	• Determine the data needed to answer a specific question; organise, present, analyse and interpret the data in tables, diagrams, tally charts, pictograms and bar charts using a graphing package or a database where appropriate • Use a data logger or measuring App to log discrete and continuous data. Understand the difference between discrete and continuous data • Interpret the data collected to see patterns, describe events and answer questions • Understand and use a greater range of scales in their representations of the data • Understand the importance of accuracy when collecting and entering data into a database • Enter data into a spreadsheet and illustrate choosing the most appropriate chart • Enter data into a spreadsheet and make use of the simpler functions such as sum, and simple calculations(+ - x ÷) to create a budget e.g. for a cake recipe • Understand that a spreadsheet can perform calculations on the data held within it • Know that personal data is stored on systems, discuss the need to keep it safe with passwords and other devices (finger print, security cards, iris scans)
Lesson content (Exemplars)	• Children collect weather data and use this as part of their work in comparing weather around the world. They could use a data logger to record local data • Children use a heart monitor in PE to record changes to the body during exercise • Continuous temperature data of the classroom is recorded to show daily variations	• Use a prepared database containing inaccurate information to illustrate the importance of entering data accurately (rubbish in, rubbish out - RIRO) • Take a data logger for a walk recording light, sound and temperature • Use data logger to illustrate how insulation slows the cooling of warm water • Explore the use of simple formulae in a spreadsheet setting up a worksheet to do calculations, +, -, * and / - to calculate a class budget or recipe
Suggested Resources	**Database Software:** *e.g. Textease database, Information Workshop, Purple Mash – 2Investigate* **Graphing Software:** *2Graph, Excel, RM Starting Graph, Textease* ***Spreadsheet****: 2Calculate, Excel* **Other:** *Data loggers and software – Apps on iPads or Android devices*	

Ashton West End Primary Academy Computing Curriculum
Upper KS2: Year 5 and Year 6

The Computing Curriculum

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. –*
Computing in the Primary Curriculum – A Guide for Primary school Teachers by CAS NAACE



National Curriculum Computing programmes of study: Key stages 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.

Schemes Overview for Upper KS2

NB Statements in red are specific to e-safety

<table>
<tr><td rowspan="2">Computer Science (CS)</td><td></td><td>Programming, Coding and Controlling Devices
Pupils will explore computer programming and computational thinking in different contexts. They should have opportunities to explain the thinking behind their algorithms, talking through the steps and explaining why they've solved a problem the way they have. They also need to be able to look at a simple programming project and explain what's going on.
• Undertake creative projects using procedures and variables to achieve specific outcomes to create a game or an App or control a specific device
• Build a sequence of instructions Algorithms to control a device, create a simulation, an App or game considering the inputs and outputs
• The code can draw upon their knowledge of
  ◦ Sub-procedures
  ◦ Physical inputs and outputs
  ◦ Values, including random numbers
  ◦ If . . . then conditional commands
  ◦ Variables
• Explain the purpose and function of the code in the project
• Compare and contrast different coding languages they use recognising similarities and differences</td></tr>
<tr><td>Digital Literacy (DL)</td><td>Digital Exploration
Pupils will explore finding information on the Internet efficiently and safely considering plausibility, bias and accuracy of information
They will explore concepts such as where information and digital files are stored, who might create them, how they can find information in a safe and productive way. They will understand not all information is correct and use methods to check for bias, and plausibility
• Understand the need for responsible use on all connected devices and know how to deal with content that upsets them or is inappropriate.
• Storing and retrieving digital content in different contexts
• Begin understanding search engine technologies and developing search techniques to refine searches for specific content
• Evaluating and analysing information for plausibility, bias and accuracy of information
• 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</td></tr>
<tr><td colspan="2">Digital Literacy (DL)</td><td>Communicating and Collaborating
In this strand the pupils will explore communication and collaboration tools. They will consider the e-safety rules and how this keeps them safe at school but also consider them in a wider context. They will learn how contributions online are stored and how to be a responsible member of online communities.
• Importance of keeping personal information private on the web
• Use a wide range of tools to communicate and collaborate online in different curriculum contexts
• Talk confidently about cyber-bullying and how to prevent and respond to it
• Show an understanding of personal safety when using devices and the possible implications of misuse
• Know the risks when communicating and publishing within and beyond the school
• Understand that the internet has many features that can enable communication between groups beyond their school and be aware of the impact of their own contributions and online presence
• Understand the implications of being a responsible member of a connected community</td></tr>
</table>

Information Technology (IT)	**Multimedia** Pupils will create multimedia content in different curriculum contexts: This unit relates closely to Digital Imagery, Music and Sound as well as Communicating and Collaborating • Select an appropriate medium to communicate information choosing content and structure showing awareness of audience and purpose • Plan, design and style content for a presentation, combine a range of sources, images, text, sound, considering the intended audience • Use formatting, design and editing tools to present different styles of information • Publish work collaboratively on a VLE/ learning platform for different audiences (Also see the strand Communicating, Collaborating and Publishing) • Be confident in all aspects of the school's e-safety rules and consider issues such as copyright and plagiarism when using resources from the Internet – images and or sounds
	Digital Media Pupils will explore digital images and moving images in different contexts: • They will use a range of graphics, paint packages, cameras and capture devices, photo manipulation software, animation and film creating and editing. • They will also consider safe searching, copyright and privacy issues when sharing images with a wider audience • Using a variety of tools and Apps to create and manipulate an images • Selecting, using and combining a variety of software on a range of digital devices to design and create content that accomplish given goals • Choosing appropriate tools and techniques to create imagery for a specific task • Amending and combining digital images , animations and movies for a specific audience or task • Understand how images can be shared – understand who might see an image they have shared • Be able to talk about privacy in the context of digital imagery
	Music and Sound **In this strand:** Pupils will explore sound in different contexts • They will understand that their sound can be added to different software to create multimedia • They will learn to use different software to create, edit and manipulate sounds • They will learn how to save retrieve edit and share their compositions or podcasts
	Collecting, Analysing, Evaluating and Presenting Data Pupils will explore data in different contexts: They will use charting software and databases to collect and present their data to support other areas of the curriculum such as science, geography, maths D and T. They will use data loggers or Apps on tablets to capture data. They will be introduced to spreadsheets to solve specific problems. They will consider data in the wider context; what types of information are stored, how to keep data secure and private • Begin to develop knowledge about how data is used in the world around them how/where it is collected. They will also consider issues such as accuracy, privacy and keeping data safe • Use spreadsheets to develop an understanding of simple functions and create a simple • budget Use a variety of tools to collect data – Data loggers, weather stations, Apps on tablets, sport related tools • Use the data collected to interpret, recognise patterns, describe events and answer questions • Use databases to detect anomalies and inaccuracies and understand the need for accuracy when entering data • Understand that personal data is collected by others for a variety of purposes – understand the consequences of losing data or incorrect data • Use a spread sheet to write formulae to carry out calculations and use them to solve problems

Upper KS2: Programming Coding and Controlling Devices (Computer Science)

Year Group	Year 5	Year 6
Learning Objectives	• **Debug** some pre-prepared **code** to accomplish a specific goal, including controlling or **simulating** physical systems • Solve problems by decomposing **code** into smaller parts by using procedures and sub-procedures • Work with **conditional commands** and use various forms of **input** and **output** using onscreen sprites or a control box • Explain the function of the **algorithm** behind each part of the code	• Design, write and **debug programs** that accomplish specific goals, including controlling or **simulating** physical systems • Work with **variables, random variables**, **conditionals** and various forms of **input** and **output** • Use logical reasoning to explain how some **algorithms** work and detect and correct errors
Teachers enable progress –	• Provide code illustrating a real life problem to be analysed and debugged • Demonstrate when to make **procedures** more efficient by using **sub-procedures** • Set investigations involving refining sequences of **code** using **procedures, sub-procedures,** *If . . . then* **conditional** commands and **inputs** and **outputs** either on screen or with a **control box** • Show how to use feedback from a monitoring device (e.g. sensor) to control **procedures** • Set investigations that demonstrate a deeper understanding of **programming** by allowing the children to independently design and write programs that accomplish specific goals, including **controlling** or **simulating** physical systems • Challenge children to design a program to control a model created in design technology with inputs and outputs (See Design and Technology POS) • Challenge children to explain how their sequences work step by step	

Children will	• Find errors and improve given code (**debug**)
	• Create **flow diagrams** to explain what is happening and illustrate how **control** impacts on our lives
	• Build **code** to **control** a device or create a game which includes **inputs** and **outputs** and make use of:
	  ◦ **Sub-procedures**
	  ◦ Physical **inputs** such as a **sensor** and **outputs**
	  ◦ **Values** and/or **variables**
	  ◦ ***If. . . . then*** conditional commands
	• Refine procedures to improve desired outcomes through the use of loops or repeats
	• Evaluate, test and **debug** the **code** explaining the processes
		• Undertake creative projects using procedures and variables to achieve specific goals – E.g. control a device linked to work created in Design and Technology
		• Build a sequence of instructions to control a device, simulation, App or game with **inputs** and **outputs** which includes:
		  ◦ **Sub-procedures**
		  ◦ Physical **inputs** and **outputs**
		  ◦ **Values**, including random numbers
		  ◦ ***If . . . then*** conditional commands
		  ◦ **Variables**
		• Explain the purpose and function of the **code** in the project
		• Compare and contrast different coding languages e.g. Flowol, Scratch, Espresso Coding recognising similarities and differences

Lesson content (Exemplars)	• Evaluate and correct given code that contains errors for e.g. a burglar alarm • Programme an onscreen sprite to draw nested squares using procedures and sub-procedures • Programme a Probot to switch on lights when going through a tunnel • By the use of a light sensor turn on a lighthouse light when it gets dark • In Scratch create a racing track where the car must stay on the track • Use Scratch to set a scoring system which counts how many times the car hits the side of the track • Check that coding includes procedures, loops or repeats to make it as efficient as possible	• Using a control box, control the speed of a motor that drives a fairground ride • Use a control box to simulate a fairground ride e.g. stopping , starting, flashing lights • Extend the code to include a light sensor so the ride only works in the dark • Use Scratch to write a simple game of e.g. Ping-Pong • Devise a scoring system for a game • Use Kodu to plan and create a game for an infant aged child • Draw a chart that explains how each part of the code works • Create a dictionary of commands explaining the meaning of each part of the code
Suggested Resources	Flowol (with FlowGo, mimics, models and home-made models), CoCo and simulations, Scratch – Scratch 2.0 (online and free download), BYOB, Mission Maker Immersive, Kodu Microsoft free download, Espresso Coding, Lego Mindstorms, K'nex, 2Code – Purple Mash	

Upper KS2: Digital Exploration (Digital Literacy and Computer Science)

Year Group	Year 5	Year 6
Learning Objectives	• Begin to use search technologies more effectively • Appreciate how results are selected • Begin to be discerning in evaluating digital content • Use technology safely, respectfully and responsibly • Understand computer networks including the internet (the hardware; cabling, servers etc.) and how it can provide multiple services such as the world wide web and email	• Use search technologies effectively • Appreciate how results are selected and ranked • Be discerning in evaluating digital content • Use technology safely, respectfully and responsibly • Understand computer networks, including the internet and mobile networks, and how they can provide multiple services such as the world wide web, SMS, 3G etc. • Understand that personal data is collected and may be used for a number of purposes
Teachers enable progress –	• Demonstrate different ways to use search technologies effectively, e.g. entering +, -, "" and **Boolean** logic operators • Demonstrate how results are selected and ranked such as popularity, number of links, titling, words related to the search, paid linking, reputation • Discuss the legality of copyright and the acknowledgement of the copyright holder. Explain plagiarism and the importance of acknowledging source material • Provide opportunities for children to use a range of sources to check the validity of data. Discuss the possibility of different viewpoints and the impact of incorrect data • Explain and demonstrate that the Internet may contain material that is irrelevant, biased and implausible • Discuss personal safety when using the Internet and how to keep safe and what to do if inappropriate materials are found either in school or at home • Explain the basics of how data is stored and transferred across the internet, e.g. world wide web, cloud storage, cookie and that some sources are filtered • Illustrate how computer networks including the internet are connected. Discuss how the sorts of services they provide, such as the world wide web; and the opportunities they offer for communication and collaboration	
Children will	• Use pictures, text and sound in a presentation acknowledging their source • Check the plausibility and accuracy of information by using more than one source • Use a selection of Boolean searches to make searches more efficient • Talk about where web content might originate from by looking at web addresses including websites that are designed to sell products (specifically to children) • Discuss how they have kept safe in school or at home whilst undertaking an internet search activity and understand that content may be filtered • Demonstrate an understanding of the main parts of a network and the internet and the ways that data can be transferred and stored	• Acknowledge the source when taking pictures, text and sound from the Internet • Check the plausibility, bias and accuracy of information by using information from more than one source • Understand how search engines tailor results to the user through the use of cookies, ranking, profiling and paid for results • Talk about where web content might originate by looking at web address, the author and other linked pages • Discuss responsible use all connected devices and why the school has e-safety rules • Demonstrate an Understanding of computer networks including the internet; discuss the kinds of services they provide such as the World Wide Web and how different communication tools connect.
Lesson content (Exemplar)	• Children complete a project including acknowledgement of the copyright holder • Children compare search results from different search engines • Children create a diagram of the main parts of the fixed computer network which connects them to the internet, such as Wi-Fi, internal network, server, external network, data centre (cloud storage)	• Children are given an activity which uses both "fake" and genuine information without prior knowledge and recognise the difference either during the activity or on evaluation • Children identify sections of a search results page including information which is ranked, which is advertising and which may be the result of either a cookie or a profile • Children create a diagram of how their personal digital devices connect to the internet, the kind of content that reaches their devices and where and how the data is tracked. (Bluetooth, 3G network, SMS, GPS tracking). • To know which Apps are accessing this information and how they can control their uses
Suggested Resources	***A variety of internet enabled devices, internet search engines, school e-safety rules, word processor or VLE/ platform to edit information,*** *www.commoncraft.com/videolist* ***Fake websites*** *http://www.thedogisland.com , www.allaboutexplorers.com More resources will be curated on the Wokingham WSH hub* We recommend when planning this unit you refer to a Key Resource available through the SWGFL: http://www.digital-literacy.org.uk/Home.aspx	

Upper KS2: Communicating and Collaborating (Digital Literacy)

Year Groups	Year 5	Year 6
Learning Objectives	• Be knowledgeable about the school's e-safety policy and reflect on its relevance to access to home and mobile devices • Understand ways of preventing and responding to cyberbullying • Understand the importance of privacy when online and that certain information should not be publicly available • Understand how their contributions in a connected community can reflect on their self-image	• Understand the responsibility of publishing on the Internet in terms of personal safety, appropriateness and relevance of content • Follow the schools e-safety policy and help younger pupils to do so. • Be aware of the e-safety rules when working from home and on mobile devices • Understand the need for a positive online profile in order to be a responsible member of a connected community
Teachers enable progress –	• Discuss the importance of e-safety on all devices in the wider context of school, home and beyond • Provide opportunities for children to understand the importance of behaving responsibly when using on-line communities • Create opportunities for pupils to share and contribute ideas online through blogs, wikis and forums enable them to respond to peers/guests considering style and audience • Discuss ways to prevent cyber-bullying and how to respond if it occurs	
Children will	• Talk confidently about cyber-bullying and how to prevent and respond to it • Show an understanding of personal safety when using devices and the possible implications of misuse • Know the risks when communicating and publishing within and beyond the school • Discuss the different styles of language, layout and format of different electronic communications • Design their own pages online, using a range of skills (such as hyperlinks, embedding video, tables, flash files, games) • Contribute/edit/refine from self and peer evaluation wiki / blog entries and understand that all changes are visible	• Discuss e-safety, develop and keep personal rules to keep themselves safe at school and home using communication devices • Construct a positive online profile for school • Understand that the internet has many features that can enable communication between groups beyond their school and be aware of the impact of their own contributions and online presence • Independently use previously learnt skills to choose, initiate and take part in learning activities by using responsibly a range of online communications • When communicating online, refine their use of layout tools, considering the intended audience
Lesson content (Exemplar)	• *Children create e-safety quizzes or surveys for use beyond the school* • *Set up a wiiki on a school visit to plan, prepare and add to on their return* • *Children create pages on a topic. They use forums to gather evacuation memories from grandparents and families* • *Children use a forum to hot-seat a character from a book; children in role consider the most appropriate responses* • *Children gather information from other schools using forum tools on a sports project* • *Create a guide to sharing information online for use with younger users* • *Share games created in Computer science – use a survey to get feedback*	• *Children create a questionnaire to obtain information about their locality and invite pupils in the school to take part* • *Children correspond with pupils in other countries to find out about how they celebrate various festivals, their education system etc.* • *As part of a transfer project children use forum tools to ask questions to Year 7 pupils about what their new school is like* • *Children create a resource to support their peers learning for maths or science* • *Use drama to explore consequences of cyberbullying or posting inappropriate content online* • *Write a leaflet for a parent explaining how to keep themselves safe online*
Suggested Resources	*VLE/ learning platform, Online Educational Community e.g. Edmodo, blogs, wikis, and forum tools , publishing software* *Key Resources can also be found through the SWGFL Digital Literacy Curriculum to support Key aspects of Safety and being a responsible digital citizen http://www.digital-literacy.org.uk/Home.aspx	

Upper KS2: Multimedia (Information Technology)

Year Group	Year 5	Year 6
Learning Objectives	• Plan a presentation, combined from a range of sources, organised and refined to suit purpose and audience • Know that there are risks when accessing resources on the Internet	• Communicate information having made choices about the appropriate medium, content and structure demonstrating an understanding of audience and purpose • Be confident in all aspects of the school's e-safety rules
Teachers enable progress –	• Demonstrate a variety of hyperlinking within multimedia to include sound, video, animation and web links (previously evaluated) • To consolidate the school's e-safety rules including the risks involved in accessing online resources and the importance of copyright • Model non-linear presentation such as a multimedia story with several possible endings • Model and compare different multimedia applications showing how they can be enhanced by using a variety of tools • Encourage children to understand the merit of different applications	
Children will	• Develop and use criteria to evaluate the design and layout when creating a range of multi-layered multimedia resources • Understand how pages are linked together and recognise the need for clarity in the structure. Produce a diagram to show the links between pages • Create a range of hyperlinks to produce a non-linear presentation • Select and import sounds from their own recordings; create their own effects and music and also import from other sources • Know the risks involved when accessing resources from the Internet in school and at home • Format and edit work to improve consistency, clarity and mood, use a range of tools e.g. cut and paste, justify, insert and replace and format text to indicate relative importance of certain aspects of their presentations	• Introduce choice when creating non-linear presentations so that the viewer can choose where to go within the presentation • Create a page of sounds which are activated by appropriately named and positioned action buttons • Choose and use a range of software appropriate to the task to communicate their ideas effectively • Choose and evaluate appropriate techniques to create an effective and well-polished piece of work considering purpose and intended audience
Lesson content (Exemplar)	• Create and publish a presentation about their school for the community being able to justify their choice of medium and content • Create a narrated big book for a younger audience including sound (literacy) • Create an EBook resource on a specific topic to be shared in the library • Create an interactive map or game	• Presentation of a design and technology project such as building a fairground to potential theme park developers • Children collaborate to develop and extend their fiction writing through the creation of a text adventure on screen with a choice of outcomes • Presentation of any topic, aimed at a specific audience but with children given full choice on how to plan and carry out presentation
Suggested Resources	***DTP Tools:*** *Purple Mash Creative Tools: 2Publish, 2Publish Extra, 2Publish Projects, Word, Publisher* ***Multimedia Authoring Tools:*** *2Create a Super Story, Clicker, Textease, Kar2ouche, PowerPoint, iPad and tablet Apps, Web2 applications* ***Other Resources:*** *microphone and digital sound recorder, camera.* ***Web and publishing****: VLE/ learning platform*	

Upper KS2: Digital Media (Information Technology)

Year Group	Year 5	Year 6
Learning Objectives	• Combine and evaluate digital images from a variety of sources • Evaluate the difference between object based graphic packages (CAD) and paint packages • Consider the quality of their work and their intended audience when creating animation, images or film	• Choose appropriate tools and techniques to create imagery for a specific task • Amend and combine digital images and movies from different sources for a specific audience or task
Teachers enable progress	• Provide opportunities to generate, amend and combine digital images from different sources for a specific audience or task • Demonstrate the impact of how specific graphics including logos, branding and adverts are used to enhance a presentation or communicate an idea • Encourage pupils to evaluate routinely and improve as part of a design process • Discuss and demonstrate the difference between object based graphic packages (CAD) and paint style packages. • Look at different genre types in media and film, discuss how they are different and how they have certain styles or formats (new broadcast, advert, documentary- or film types: drama, funny , scary, romantic, sci-fi etc) Discuss how they are filmed and edited to make them fit a genre – sound, light, camera position etc • Provide creative opportunities for pupils to generate media, amend and combine digital content (video, images, animation) and consider genre and audience • Discuss how photos can be altered digitally, consider the creative upsides of photo alteration, as well as its power to distort perceptions • Discuss and illustrate the concept of digital rights, illustrate the concept of copyright and how we abide by its laws	
Children will	**Graphics Packages** • Develop a range of techniques to illustrate their work. Explore different digital tools and mediums to create different effects on screen. • Through peer and self-evaluation, children refine and make appropriate changes to their graphic work • Use an object based graphics package (CAD) in a design activity Also see POS for Design technology **Digital Video** • To use different filming techniques and camera angles e.g. zoom, panning, wide shots etc. to create a different mood or perspective • Develop an awareness of purpose and audience through evaluation and editing **Animation (Long Unit)** • Consider different types of animation (stop motion, computer generated) Plan and create an animated sequence to communicate a specific idea, or tell a story. Develop a storyboard create animation, add titles, cedits and sound effects. • Children discuss and evaluate their own and others' animations and refine them for a given audience or task	**Graphics Packages** • Find a solution to a specific problem using an object based graphics package (CAD) Also see POS for Design technology • Deliberately edit images t create fakes or enhanced – talk about images can distort perceptions **Digital Video – (Long Unit)** • Consider different genres of film and media – consider use of sound, imagery and light (documentary, news, film – scary, sci-fi, funny) • Plan a short film considering genre type – select appropriate shots, music and when using devices they take into account background, camera position and sound quality to ensure the recording is fit for purpose • Edit their movies considering genre and add appropriate effects and sound. • Children discuss and evaluate their own and others' movies and refine them for a given audience or task • Understand issues relating to sharing content and issues surrounding permissions, who can see it and issues of copyright
Lesson content (Exemplar)	**Example Cross Curricular links and outcomes** • *Design a new playground for the school* • *Children create their own silent film with music they have composed* • *Create an advert for healthy food, using either live action or animation* • *Children learn how photos can be altered digitally. They will consider the creative upsides of photo alteration, as well as its power to distort perceptions*	**Example Cross Curricular links and outcomes** • *Presenting work on "Britain since 1948", children could create a TV programme incorporating sounds, photographs and video from different decades, with voice-overs and linked pieces* • *Different artistic styles could be explored in art packages, and CAD tools could be used to design buildings of different architectural styles as well as predicting those of the future.*
Suggested Resources	**Graphics:** *Paint.NET, 2Simple – 2Paint a Picture, Purple Mash: 2Paint, 2design and Make,* **CAD Package** *or object orientated manipulation – Publisher, Powerpoint* **Animation:** *2Animate,Puppet Pals app, Stop Motion app* **A range of digital capture tools:** *e.g. Digital camera, tablet, other image capture devices, visualisers, microscope* **Video Editing** *: Imovie, Windows Live Movie Maker,* ***Sharing*** *their work on the VLE/ learning platform*	

Upper KS2: Music and Sound (Information Technology)

Year Group	Year 5	Year 6
Learning Objectives	• Select and use suitable software and hardware to produce a multi-track audio presentation • Begin to compose, manipulate and refine music and sound for a given audience or project • Use audio broadcasting tools to share their work with a wider audience • Understand their responsibility towards copyright issues	• Understand that a professional broadcast is made up of many parts and to identify key features of different broadcasts • Create music or soundtracks to accompany a story, multimedia presentation or digital movie considering specific audience and purpose (see Digital Media Unit)
Teachers enable progress –	• Listen to radio broadcasts and identify different sound elements and key features • Demonstrate how to use software with a timeline to layer sound, adding voice, music and sound effects • Demonstrate manipulation and editing existing sound files using computer software, e.g. reverse, layer, trim, fade in/out • Discuss issues of copyright when downloading and uploading files • Teach the difference between sound file formats and how to convert or export files as necessary	
Children will	• Create their own sounds and compositions to add to their presentations/films/images/photos • Begin to have an awareness of different sound file formats. – e.g. MP3 files are smaller than .WAVs and may be more suited to import into a multimedia presentation **Podcasting** (longer Unit) • Plan and create a broadcast considering genre and style • Record and edit a radio style broadcast use sound manipulation software to edit their broadcast considering audience and style • Upload their work on the internet for self and peer evaluation • Know the risks in uploading resources to the Internet	• Independently choose and use an appropriate device to record sounds in order to create a sound file • Choose to use software independently to manipulate sounds using computer software e.g. remove unwanted silences, trimming start and end • Use technology to produce sound and music for a specific purpose, considering the impact on the audience e.g. length or sound level of performance • Use the sounds, music created in a film project (see digital media unit)
Lesson content (Exemplar)	• *Record a live performance* • *Compose space-themed music by manipulating a variety of recorded and found sound files using Audacity* • *Compose music to accompany dance or dramatic performances*	• *Extended compositions* • *Composition to accompany a presentation/film/animation/image on a given topic* • *Add narration over film/video/animation/multimodal writing using a microphone linked to a computer* • *Select suitable music and/or sound to add atmosphere and enhance a multimedia presentation/film/image/photo, considering specific audience and purpose*
Software/ hardware etc.	***Music composition software:*** *e.g. Black Cat Compose, Compose World, Notate, 2simple music toolkit, Online tools:* ***Purple Mash*** *2Sequence, Garage Band* ***Multimedia software****: to record sound straight into (e.g. 2Create a super Story, Kar2ouche, PowerPoint, Photostory* ***Sound resources****: www.findsounds.com, ,* http://audio.lgfl.org.uk ***Sound Manipulation:*** *Audacity (free), Podium,* ***Sound Capture:*** *Microphone and digital sound recorder; electronic keyboard, sound recording apps*	

Upper KS2: Data Handling - Collecting, Analysing, Evaluating and Presenting Data (Information Technology)

Year Group	Year 5	Year 6
Learning Objectives	• Model and set problem solving activities that require the children to carry out complex searches of databases • Develop independence in their use of data loggers and measuring Apps to investigate and interpret changes in a variety of conditions • Use a prepared database with anomalies and inaccuracies, model how to check for accuracy and plausibility • Understand that personal data is collected by others for a variety of purposes and it needs to be accurate and secure • Use a spreadsheet to carry out calculations that require formulae	• Set up a database with appropriate fields in order to reach specific conclusions • Understand the use of appropriate presentation to represent different types of data by the use of e.g. pie chart, bar chart or line graph • Become more familiar with database tools such as logical searches, sorts and filtering Understand how variables in a spreadsheet formula can be used to solve a problem • Use formulae within a spreadsheet to plan/model a variety of events • Plan and carry out how data from a data logger could be used to prove various hypotheses • Understand the difference between sensitive and non-sensitive personal data. Understand the need for data to be accurate and secure.
Teachers enable progress	• Discuss how ICT is used in their lives and how data is used in the world around them. • Discuss issues such as plausibility, accuracy, privacy and keeping data safe. Talk about sensitive and non-sensitive data and how to protect it • Demonstrate that information held on databases may contain errors and that this can affect the use of data in the outside world (e.g. police/ doctors/banks/school database) • Demonstrate how tools such as searches, filters, sorting and graphing refine the information and may identify anomalies • Model how to organise data in a spreadsheet and how formulae function	
Children will	• Determine the data needed to answer a set of related questions, select and organise relevant information • Use frequency tables, pictograms, bar graphs and line graphs representing the frequencies of events and changes over time, use ICT to present and highlight features that lead to further questions • Make simple searches using **and/or/>/<** to search data when looking for relationships and patterns in data • Check for the accuracy of data by using different views, search tools and graphs • Model a familiar situation using appropriate formulae in a spreadsheet e.g. a birthday party or Christmas present list • Use a data logger to compare the efficiency of various materials • Know that personal data needs to be kept safe such as passwords and personal information and this is protected by law	• Choose appropriate applications to solve data handling problems • Independently collect and organise data in an efficient and accurate way by designing fields and records in a database • Interpret data by using a range of searches, sorting , filtering and graphing and check for accuracy • Become confident in the use of logical operators whilst carrying out database or internet searches, **and/or/>/<, not, “”** • Set up a spreadsheet to model the cost of an event e.g. mini-enterprise or class outing and provide a variety of costed options • Use a data logger to demonstrate how changes in the environment can be illustrated in a variety of ways • Know that personal data may be sensitive or non-sensitive and different rules apply to each
Lesson content (Exemplars)	**Example Cross Curricular links and outcomes** • Children create a database to record responses from a survey of parents/grandparents about games they played? Toys they had? Where Holidays were, comparing data with today’s experiences. • Children record and analyse the results of an experiment stretching elastic bands • Prepare a spreadsheet that demonstrates the frequency and variation of litter found on the playground • Use a data logger to find the best fabric for curtain material, or the best material for insulating sound	**Example Cross Curricular links and outcomes** • Children compare data about themselves with those from a younger class (Starting with a hypothesis e.g. do children with longer legs run faster or can taller children throw a ball further; Use a database to answer the hypothesis.) • Children gather data about local issues e.g. litter, traffic or pedestrian flow, accidents, to make conclusions and to present this to others • Use a spreadsheet to model a car wash mini-enterprise or class outing, and present their findings giving reasons for the choices made • Use a data logger and camera to compare daily variation in cloud cover and sunlight
Suggested Resources	**Database Software:** *e.g. Textease database, Information Workshop, Purple Mash – 2Investigate* **Graphing Software:** *2Graph, Excel, RM Starting Graph, Textease,* ***Spreadsheet****: 2Calculate, Excel* **Other:** *Data loggers and software – Apps on iPads or Android devices*	