



## COMPUTING

### Nursery Class

#### KEY SKILLS

##### *Text, multimedia & ICT*

- Can share the use of technology in school. Knows some common uses of information technology beyond the classroom
- When working with an interactive ICT resource with an adult can point out where to click next.
- Use an Interactive whiteboard for mark making.
- Understand that the mouse moves the cursor and controls actions on screen.
- Use a keyboard in play writing.
- Be aware that text comes in different colours, sizes and styles.

##### *Images, sound, video & animation*

- Can respond to an interactive resource e.g. clap along to a CD ROM song.
- Can use role play devices linked to ICT in the correct manner i.e. understands that a telephone is put against your ear.
- Explore ways of making and listening to sounds using simple programs and devices, e.g., karaoke machines, music mats and piano keyboards.
- With help, use buttons to play back sounds on a computer and a sound player

##### *Electronic communication*

- Use different forms of electronic communication in free play, e.g., email, mobile phones, hand-held devices, walkie-talkies, sound recording devices.

##### *Digital research & E-Awareness*

- Be aware that information can be in different forms, e.g., video, pictures and sound, as well as text.

##### *Logo & control, algorithms*

- Understand what commands are needed to control different devices, e.g; press a button to make a toy work.

##### *Simulations, modeling and Programming*

- Be aware that computers can make imaginary things happen on-screen, which may not happen in everyday life.

##### *Knowledge & concepts*

- Let's create! ICT around us



## COMPUTING

### Reception Class

#### KEY SKILLS

##### *Text, multimedia & ICT*

- Begin to use a keyboard to type letters, words, numbers on screen. Use, backspace (to delete) arrow keys and space bar.
- Explore changing text, style and colour using simple software.
- Print out work using simple software.
- Can share the use of technology in school. Knows common uses of information technology beyond the classroom.

##### *Images, sound, video & animation*

- Understands that digital content can be represented in different ways.
- Use a paint program or interactive whiteboard software to make marks with simple tools e.g. changing brushes, fill, colour and stamps.
- Interact and explore their environment with digital cameras and other multimedia devices.
- Can use a simple music/sound player.
- Can record sounds using simple devices e.g. talking tins.

##### *Electronic communication*

- Continue to use more accurately different forms of electronic communication in free play e.g. e-mail, walkie-talkies, mobile phones etc.
- Can find content from the world wide web using a web browser with supervision.

##### *Digital research & E-Awareness*

- Use a shortcut on the desktop to navigate to a specific website.
- Explore a teacher selected website, talking book, or computer programme.
- Can use a computer to find things out.
- Can explain which buttons to use to navigate.
- Know not to use real names on the internet.

##### *Data handling*

- Collect information e.g. by taking photographs or collecting objects.
- Use ICT to sort and sequence items on screen or on an IWB.
- Can use a pictogram to compare things.
- Can identify 'more' or 'less' on a pictogram

##### *Data logging*

- Children are aware of everyday devices that sense data e.g. simple sound recorders, metal detectors, bar code scanners, automatic doors etc.



### *Logo & control, algorithms*

- Use a variety of toys in play situations e.g. radio controlled toys.
- Explore toys that simulate control devices e.g. traffic lights, microwave, cash tills.
- Knows that computers need precise instructions (algorithms)
- Can show care and precision to avoid errors (algorithms)
- Can use single step instructions to control a robot/beebot.
- Can use a mouse with increasing accuracy to make choices.
- Can use the mouse buttons, keyboards numbers and arrow keys.
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### *Simulations, modelling & programming*

- Compare real life and virtual simulations e.g. colour in a shape, dress teddy.
- Explore simple simulations and find out "What happens if..."
- Navigate simple computer games on screen e.g. BBC Skid the Squirrel.
- Can create pictures of real and imaginary places.
- Knows what an algorithm is and I can express simple algorithms using symbols (algorithms)
- Can create a simple program.

### *Knowledge & concepts*

- Let's Create! ICT around us



## COMPUTING

### Year 1

#### KEY SKILLS

##### *Text, Multimedia, ICT*

- Continue to develop keyboard skills, using backspace, delete, shift (instead of caps lock) and enter.
- Word process short text straight on to the computer.
- Navigate around text in a variety of ways including using the mouse and arrow keys.
- Select text from word lists.
- Make simple changes to selected text e.g. colour, size and style..
- Can share my experiences of technology in school and beyond the classroom.

##### *Images, Sound, Video and Animation*

- Refine their use of shape, line and colour for a specific idea, artist or effect through various tools e.g. spray, flood fill, stamps etc.
- Can use a variety of software to manipulate and present digital content: and information.
- Use a range of electronic devices to capture still and moving images e.g. digital camera, basic video camera.
- Explore a range of electronic music and sound devices and software.
- Select and listen to sounds from a pre-recorded bank of sounds.
- Use sound recorders both at and away from the computer and record and playback the sounds e.g. record voice with computer microphone, use Easi-Speak microphone to record Environmental sounds.

##### *Electronic Communication*

- Contribute ideas to class and group e-mails.
- Contribute to a blog or other section of the school VLE (Moodle)
- Know what to do and who to tell if they see something inappropriate online e.g turn monitor off in accordance with school e-safety policy.
- Can navigate the web and can carry out simple web searches to collect digital content.

##### *Digital Research and E-Awareness*

- Use and explore appropriate buttons, arrows, menus and hyperlinks to navigate teacher selected websites.
- Use key words to search for a specific resource under adult supervision e.g. Espresso search.
- Know what to do and who to tell if they see something inappropriate online e.g turn monitor off in accordance with school e-safety policy.

##### *Data Handling*

- Knows that data can be structured in tables to make it useful.
- Sort and classify a group of items by asking simple yes / no questions. This may take place away from the computer, e.g., a 'Guess Who' game.
- Use simple graphing programs to create pictograms and basic tables or graphs.



### *Data Logging*

- Can read simple sensing equipment e.g. electronic thermometer in classroom.

### *Logo and Control, algorithms*

- Know that algorithms are implemented on digital devices as programs. (algorithms)
- Can find and correct errors i.e. debugging, in algorithms.
- Give and follow commands (one at a time) to make a control toy move in a desired manner.
- Make simple predictions when controlling devices.
- Write or draw basic instructions for a control toy.

### *Simulations, Modelling and Programming*

- Can use logical reasoning to predict the behaviour of programs.
- Know different types of data: text, number.
- Explore real and virtual simulations e.g. BBC science clips, virtual plants, pets
- Can use a simulation to explain real things.

### *Knowledge and Concepts*

- Introduction to modelling
- Using a word bank
- Information around us
- Labelling and Classifying
- Pictograms
- Understanding instructions



## COMPUTING

### Year 2

#### KEY SKILLS

##### *Text, Multimedia, ICT*

- Can show an awareness for the quality of digital content collected
- Create simple presentations from given templates.
- Begin to use both hands when typing.
- Select text by highlighting or clicking.
- Save, retrieve and amend work.
- Can talk about my work and make improvements to solutions based on feedback received.

##### *Images, Sound, Video and Animation*

- Can use a variety of software to manipulate and present digital content: and information.
- Can search the internet for a specific image
- Make simple changes to a photograph using the computer e.g. cropping
- Create a sequence of images to create a short animation e.g. use 2Create a Story and 2Create a Superstory.
- Use software to explore and create sounds for a purpose.

##### *Electronic Communication*

- Send an e-mail to a known person in the school e.g. teacher, another class.
- Open and reply to an e-mail of a known member of the school.
- Know what to do and who to tell if they see something inappropriate online e.g. turn monitor off, use back key, minimize screen in accordance with school e-safety policy.
- Can navigate the web and can carry out simple web searches to collect digital content.

##### *Digital Research and E-Awareness*

- Locate specific teacher defined websites through favourites or type in the URL.
- Copy and paste information from the Internet to use in another programme.
- Know what to do and who to tell if they see something inappropriate online e.g. turn monitor off, use back key, minimize screen in accordance with school e-safety policy.

##### *Data Handling*

- Knows that data can be structured in tables to make it useful.
- Use a branching database program to sort and identify items.
- Use graphing software to enter data and change a graph type, e.g., pictogram to bar chart.

##### *Data Logging*

- Can use a basic data logger e.g. sound meter.



### *Logo and Control, algorithms*

- Know that algorithms are implemented on digital devices as programs (algorithms).
- Can design simple algorithms using loops, and selection i.e. if statements (algorithms).
- Know and can use a range of input and output devices.
- Join single step instructions together to control a robot or other control toy. e.g. Bee bots.
- Explore and create a sequence of commands to reproduce a simple geometric shape or pattern on screen.

### *Simulations, Modelling and Programming*

- Can find and correct simple semantic errors i.e. debugging, in programs.
- Can use logical reasoning to predict the behaviour of programs.
- Can create scenes using objects from a library.
- Can use a function machine for maths.
- Explains what could happen when a decision is made in a simulation.

### *Knowledge and Concepts*

- Writing Stories
- Creating Pictures
- Finding Information
- Routes, Control, Floor Turtles
- Questions and Answers



## COMPUTING

### Year 3

#### KEY SKILLS

##### *Text, Multimedia, ICT*

- Can collect, organise and present data and information in digital content.
- Continue to develop correct use of the keyboard with increasing speed and accuracy.
- Use different font sizes, colours and effects to communicate meaning for a given audience.
- Can use a spell checker and thesaurus to refine writing.
- Use page setup to select different page sizes and orientations.
- Select suitable text, sounds and graphics from other electronic sources, e.g., Espresso or VLE (Moodle/My Big Campus), and import into own work.

##### *Images, Sound, Video and Animation*

- Use a range of devices to capture still and moving images.
- Explore the use of graphics and paint packages to design and plan an idea.
- Be able to resize various elements in a graphics or paint package.
- Create a simple storyboard of images into an animation/film package to convey meaning e.g. use of Photostory.
- Use a variety of devices and software to select, playback and record voice and other sounds.
- Use simple animation software.

##### *Electronic Communication*

- Can show an awareness of, and can use a range of internet services e.g. VOIP – such as Skype.
- Log onto an e-mail account, open, create and send appropriate replies.
- Understand that some emails may be malicious or inappropriate and recognise when an attachment may be unsafe to open.
- Respect the ideas and communication that they receive online.
- Understand the need to keep personal information and passwords private in order to protect themselves when communicating online.

##### *Digital Research and E Awareness*

- Use a range of child friendly search engines to locate different media, e.g., text, images, sounds or videos.
- Develop key questions and key words to search for information.
- Know what to do and who to tell if they discover something inappropriate or offensive on a website, at home and in school.





### *Data Handling*

- Knows the difference between data and information.
- Create frequency diagrams and graphs to answer questions.
- Create and use a branching database to organise and analyse information to answer questions.
- Use a database to answer straightforward questions by searching, matching and ordering the contents of a single field e.g. finding largest and smallest data amounts.
- Talk about the advantages of using ICT to sort, interrogate and classify information quickly.

### *Data Logging*

- Knows that computers collect data from various input devices, including sensors and application software.
- Understand that data loggers can be used to sense external and physical changes.

### *Logo and Control, algorithms*

- Can design solutions (algorithms) that use repetition and two-way selection i.e. if, then and else.
- Plan, create, test and modify sequences of commands to solve open-ended problems using a floor robot, screen turtle or other programmable devices.
- Be aware that Logo is a computer programming language.
- Understand what an output is.
- Be aware that everyday devices use sensors and outputs, e.g. automatic doors, traffic lights, intruder alarms.
- Can use full-function radio controlled vehicles.

### *Simulations Modelling and Programming*

- Explore the effects of changing variables in models and simulations, asking 'What if?' questions.
- Can create programs that implement algorithms to achieve given goals.

### *Knowledge and Concepts*

- Combining text and graphics (I can present!)
- Manipulating Sounds
- Introduction to databases
- Exploring simulations
- E Mail



## COMPUTING

### Year 4

#### KEY SKILLS

##### *Text, Multimedia, ICT*

- Use cut, copy and paste to refine and re-order content.
- Can use "Find and replace" to edit a document.
- Select and import sounds from other sources, e.g., own recordings, sound effects and music.
- Select and import graphics from digital cameras, graphics packages and other sources and prepare for use, e.g., cropping, resizing and editing.
- Recognise and use key layout and design features, e.g., text boxes, columns and borders.
- Insert and edit simple tables.
- Create a range of hyperlinks and produce a non-linear, interactive presentation.
- Recognise intended audience and suggest improvements to make their work more relevant to that audience.
- Through self and peer assessment, evaluate presentations and suggest suitable improvements to their work.
- Can make appropriate improvements to solutions based on feedback received, and can comment on the success the solution.

##### *Images, Sound, Video and Animation*

- Acquire, store and retrieve images from cameras, scanners and the internet for a purpose.
- Select specific areas of an image, copy and paste to make repeating patterns.
- Edit/manipulate an image in a paint or photo package e.g. applying different special effects in Adobe Photo Illustrator.
- Use print screen function to capture images
- . Independently download and save images and video onto a computer.
- Add simple titles, credits and special effects to a storyboard image sequence e.g. Transitions between images in Photostory.
- Use recorded sound files in other software applications.
- Use music software to experiment with capturing, repeating and sequencing sound patterns. e.g. 2Simple Music.
- Develop use of animation techniques.



### *Electronic Communication*

- Know what is acceptable and unacceptable behaviour when using technologies and online services.
- Attach different files to emails, e.g., text document, sound file or image.
- Open and save attachments to an appropriate place.
- Use a range of digital tools to communicate, e.g., contributing to chats and/or discussion forums, in school's VLE (Moodle) or text messages.
- Can create digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience e.g. blogging.
- Be able to create a 'secure' password, e.g., combination of letters, symbols and numbers in accordance with the school's eSafety policies and procedures /AUP.
- Understand the risks involved in arranging to meet and subsequently meeting anybody from the online world in the offline world.
- Know that they should tell a trusted adult immediately if they are asked to meet somebody from the online world in the offline world.
- Recognise that cyber bullying is unacceptable and will be sanctioned according to the school's eSafety policies and procedures /AUP.
- Know what images are suitable to include in an online profile and ensure that appropriate permissions have been obtained, e.g., copyright or asking friends before uploading their images.
- Understand the need for certain rules of conduct particularly when using live forms of communication, e.g., chats.

### *Digital Research and E Awareness*

- Evaluate different search engines and explain their choices in using these for different purposes.
- Consider the effectiveness of key questions on search results and refine where necessary.
- Use appropriate tools to save and retrieve accessed information, e.g., through the use of favourites, history, copy/paste and save as.
- Begin to recognise that anyone can author on the Internet and sometimes web content is inaccurate or even offensive.
- Begin to understand the concept of copyright, e.g., what images, videos or sounds are legal and safe to use in their own work.

### *Data Handling*

- Know why sorting data in a flat file (a list underneath each other) can improve searching for information.
- Can use filters or can perform single criteria searches for information.
- Based on the data collected, children should raise their own questions and translate them into search criteria that can be used to find answers to specific questions.
- Compare different charts and graphs, e.g., in tables, frequency diagrams, pictograms, bar charts, databases or spreadsheets and understand that different ones are used for different purposes.
- Understand that effective yes / no questions are key to organising data efficiently in a branching database.



### *Data Logging*

- Know the difference between hardware and application (apps) software, and their roles within a computer system.
- Understand that data can be collected more efficiently by a datalogging device compared with manual methods.
- Use dataloggers to capture, record and analyse data continuously over time, including sound, temperature and light.

### *Logo and Control, algorithms*

- Can use diagrams to express solutions.
- Can use logical reasoning to predict outputs, showing an awareness of inputs.
- I can write a list of commands to draw a given shape.
- Use more advanced Logo programming, including penup/pendown, and repeat commands to create, test, modify and refine sequences, e.g., more complex symmetric and repeating geometric patterns.
- Create simple flow diagrams or pictorial sequences of commands using appropriate tools/software.
- Can control a radio control vehicle; developing finer movements of control.

### *Simulations, Modelling and Programming*

- Understand how computer simulations can represent real or imaginary situations and how these can help in the wider world.
- Use a pre-prepared spreadsheet to record data to answer questions and produce graphs.
- Change the contents of cells in a pre-prepared spreadsheet and explore the consequences.
- Can declare and assign variables.
- Can use tried and tested loops e.g. within a program can use statements such as “until”, “if”, “then” and “else”.

### *Knowledge and Concepts*

- Writing for different audiences
- Branching databases
- Modelling Effects on screen
- Questionnaires and Pie Charts



## COMPUTING

### Year 5

#### KEY SKILLS

##### *Text, Multimedia, ICT*

- Continue to develop correct use of the keyboard with increasing speed and accuracy.
- Create an outline plan for a non-linear presentation; producing a diagram to demonstrate understanding how pages link and the need for clarity.
- Develop consistency across a document, using the same styles of font, colour, size for headings, body text, etc.
- Format and edit work to improve clarity and purpose using a range of tools, e.g., cut and paste, justify, tabs, insert and replace.
- I know the audience when I am designing and creating digital content.
- I can evaluate and edit digital content for a specific audience.

##### *Images, Sound, Video and Animation*

- Acquire, store and combine images from different sources, then use to enhance a presentation.
- Create images using a range of techniques to develop a particular style.
- Can move, rotate and re-size objects with support.
- Independently select and use a variety of appropriate devices to record musical and non-musical sounds.

##### *Electronic Communication*

- Independently, and with regard for eSafety, select and use appropriate communication tools to solve problems by collaborating and communicating with others within and beyond school, e.g., email, discussion forums, wikis, text messages and other digital communication tools.
- Understand that some emails may be malicious or inappropriate and recognise when an attachment may be unsafe to open.

##### *Digital Research and E Awareness*

- Can perform more complex searches for information e.g. using Boolean, quotations marks to locate precise information.
- I know why and when computers are used.
- I know the main functions of the operating system of a computer.
- Understand the need to ignore unwanted advertising or pop-ups as they can inadvertently introduce viruses or spyware onto a computer system.
- Choose to use the internet when appropriate as a tool for independent research, e.g., gathering text, images, videos and sound as resources to use in their own work.
- Know what to do and who to tell if they discover something inappropriate or offensive on a website, at home and in school, e.g., how to minimise a screen, turn the monitor off.
- Can search a database using "and" "or"
- Can search a database using = < and > =



### *Data Handling*

- Construct, refine and interpret bar charts, scatter graphs, line graphs and pie charts.
- Design questions and perform complex searches using key words, to search a large pre-prepared database looking for relationships and patterns, e.g., data on the Internet; census data.

### *Data Logging*

- Use a data logger's pre-programming features to log data over a chosen time span (perhaps overnight).

### *Logo and Control, algorithms*

- Can show an awareness of tasks best completed by humans or computers.
- Can control simple devices, such as small motors, light bulbs and buzzers by giving direct instructions.
- Be able to choose ICT equipment as appropriate to resolve a specific problem according to users, purpose and needs.
- Can make simple predictions about effects if a procedure is changed.
- Can control digital proportional vehicles around a course.

### *Simulations and Modelling and Programming*

- Can use a spreadsheet to find out answers.
- Understand how a spreadsheet can do a range of functions.
- Can enter simple formula into a spreadsheet with support e.g. SUM
- Explore the effects of changing variables in models and simulations in order to solve a problem.
- Know the difference between, and appropriately can use if, then and else statements.
- Can create computer games using "code"

### *Knowledge and Concepts*

- Graphical Modelling
- Controlling Devices
- Analysing Data Scratches
- Evaluating Information
- Introduction to Spreadsheets
- Monitoring Environmental Conditions



## COMPUTING

### Year 6

#### KEY SKILLS

##### *Text and Multimedia and ICT*

- Develop the use of hyperlinks to produce more effective, interactive, non-linear presentations.
- Make effective use of transitions and animations in presentations. Consider their appropriateness and overall effect on the audience.
- Independently select process and import images, video and sounds from a variety of sources to enhance presentations.
- Demonstrate awareness of intended audience in their work.
- I know the potential of information technology for collaboration when computers are networked.
- I can use criteria to evaluate the quality of solutions.

##### *Images, Sound, Video and Animation*

- Independently capture, store, retrieve and edit digital images to improve them.
- Refine and make changes to images according to audience.
- Make use of transitions and special effects in video editing software, understanding the effect they have on the audience.
- Edit, manipulate and combine sound files from a range of sources for a specific purpose e.g. podcast.
- Upload and download projects to other devices and online space, e.g., 'Making the News'.
- Create more complex animations using figures and appropriate software.

##### *Electronic Communication*

- Evaluate the effectiveness of a variety of digital communication tools.
- Understand that social network or other online environments have security settings, which can be altered, to protect the user.
- Understand the benefits of developing a 'nickname' for online use where appropriate.
- Recognise that cyber bullying is unacceptable and will be sanctioned according to the school's eSafety policies and procedures /AUP.
- Can make use of internet services e.g BBC, Skype, Purple Mash
- Can show responsible use of Internet services.

##### *Digital Research and E-awareness*

- Choose the most appropriate search engine for a task, e.g., image search, search within a specific site or searching the wider internet.
- Know what to do and who to tell if they discover something inappropriate or offensive on a website, at home and in school, e.g., how to minimise a screen, turn the monitor off.
- Understand the concept of plagiarism and the importance of acknowledging and referencing sources.
- Understand that you should not publish other peoples' material on the Internet without their permission but you can hyperlink to their websites.



- Talk about validity, plausibility and appropriateness of information, especially on the internet.
- I know the differences between physical, wireless and mobile networks.

#### *Data Handling*

- Check/analyses the reliability of data and information; identify and correct inaccuracies.
- Can create a simple database.
- Recognise the need for accuracy when designing, entering and interrogating data and how this will affect the quality of information gained.

#### *Data Logging*

- Use a datalogger to make and record accurate measurements or observations and produce graphical information to answer questions and solve simple problems.
- Can use two or more sensor to detect environmental or physical changes.

#### *Logo and Control, algorithms*

- Make predictions regarding the consequences of decisions when creating sequences of commands.
- Can use wait and repeat commands.
- Can use a switch as a digital input to control events.
- Can control a series of outputs in a pre-determined way.
- Can control advanced digital proportional vehicles through a pre-determined layout.

#### *Simulations and Modelling and Programming*

- Can enter simple formula into a spreadsheet.
- Can ask 'What if ..' questions and find answers using a spreadsheet.
- Can identify patterns and relationships in spreadsheets.
- Can produce and interpret charts from a spreadsheet.
- Understand when and where it is appropriate to use a simulation to support an investigation and explain their choices.
- Know that creating sequences of commands, or programming can be represented in different formats including written and diagrammatic.
- Can design, write and debug modular programs using procedures (*modular means a program split into sections*)
- Can create more complex games using "code".

#### **Knowledge and Concepts**

- Internet Research
- Spreadsheet Modelling
- Multimedia Presentations
- Animation and Designing
- Control and Monitoring