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During the planning and implementation of IT, consideration must be given to the requirements of ICT within all curricular areas. Reference should be made to National Curriculum subject documents.

Level 1

POS	Teaching and Learning Outcomes	Resources
1. Communicating and Handling Information	**Pupils will be taught how to:**	
Word Processing	Use the computer to create lists or labels. (Use of images from a variety of sources will enhance the activity).	Computer, Word Processor, Graphic images created by pupils, Clip Art, Internet/ CD ROM images, Digital Camera, Scanner, Printer. Differentiated, focused tasks.
Graphics	Use a range of graphic tools to *produce* a picture which supports the theme/topic.	Computer, Graphic Package, Printer. *Differentiated, focused tasks.*
Music	Use a range of music tools to *compose* a short tune.	Computer, Music Package, Printer. *Differentiated, focused tasks.*
Data Handling	Use a prepared database to retrieve information and interpret graphs.	Computer, Prepared Database, Printer. Differentiated, focused tasks.
2. Modelling		
Adventure/Simulation	Explore an *appropriate* simulation or adventure such as clicking/dragging the mouse button at appropriate places.	Computer, Simulation or Adventure Package, Internet. *Differentiated, focused tasks.*
LOGO	Use simple commands, by pressing keys to control the movement of a robotic toy. (To explore real situations).	Robotic Toy. *Differentiated, focused tasks.*

Assessment	Activity Notes
Pupils have the confidence to: Choose appropriate words, use spacebar to create spaces between words, produce capital letters using the shift key and full stops. (Images inserted by teacher to enhance pupil's work). Use a range of graphic tools to draw shapes on screen, select colour, fill in drawn shapes. Use a range of music tools to compose a tune. Access information held in the computer. Navigate through the adventure or simulation effectively, clicking/dragging the mouse at appropriate places. Control a robotic toy over a given journey.	

Level 2

POS	Teaching and Learning Outcomes	Resources
1. Communicating and Handling Information	**Pupils, while implementing previously taught skills, will learn how to:**	
Word Processing	Use the computer to produce *unedited writing* to support and enhance class activities. Save and retrieve work with assistance. (Use of images from a variety of sources will enhance the activity).	Computer, Word Processor, Graphic images created by pupils, Clip Art, Internet/ CD ROM images, Digital Camera, Scanner, Printer. Differentiated, focused tasks.
Graphics	Use different brush types and sizes. Use different colours from the palette. Use the spray gun for extra effects. Save and retrieve work with assistance.	Computer, Graphic Package, Printer. *Differentiated, focused tasks.*
Music	Use a greater range of music tools to *compose/arrange* a tune. Save and retrieve work with assistance.	Computer, Music Package, Printer. *Differentiated, focused tasks.*
Data Handling	Transfer own findings from a *data capture sheet* into a database. Retrieve information and interpret graphs. Save and retrieve work with assistance.	Computer, Database Package, Printer. Differentiated, focused tasks.
2 .Modelling		
Adventure/Simulation	Explore an *appropriate* simulation or adventure and investigate options.	Computer, Simulation or Adventure Package, Internet. *Differentiated, focused tasks.*
LOGO	Plan a journey for a robotic toy/screen turtle. Test the plan making changes until the planned journey has been completed.	Robotic Toy or Computer, LOGO Package, Printer. *Differentiated, focused tasks.*

Assessment	Activity Notes
Pupils have the confidence to: Change: Font style Font size Font colour (Use images inserted by teacher.) Save and retrieve work with assistance. Change brush size and type and paint colour. Use roller to *flood fill* parts of the picture. Use the spray gun to add extra effects. Save and retrieve work with assistance. Use a greater range of music tools to *compose/arrange* a tune. Save and retrieve work with assistance. Copy their own findings from Data Capture sheet into a database constructed by the teacher. Save and retrieve with assistance. Navigate through the adventure or simulation effectively. Talk about their decisions/choices and the predicted outcomes. Write a plan to send robotic toy/screen turtle on a journey. Test out the plan. Change any commands until the planned journey has been completed.	

Level 3

POS	Teaching and Learning Outcomes	Resources
1. Communicating and Handling Information	**Pupils, while implementing previously taught skills, will learn how to:**	
Word Processing	Use the computer to produce *unedited, original work* to support and enhance class activities. Use images from a variety of sources to enhance the activity. Save and retrieve work unaided. Edit retrieved work by, for example, *deleting and inserting words, position headings and use text effects* and re-save. Print work.	Computer, Word Processor, Graphic images created by pupils, Clip Art, Internet/ CD ROM images, Digital Camera, Scanner, Printer. Differentiated, focused tasks.
Graphics	Use a greater range of tools to produce a picture. Save and retrieve work unaided. Make changes to their picture and re-save work. Print work.	Computer, Graphic Package, Printer. Differentiated, focused tasks.
Music	*Compose/arrange* a tune. Save and retrieve work unaided. Make changes to their tune and re-save work. Print work.	Computer, Music Package, Printer. Differentiated, focused tasks.
Data Handling	Transfer their own findings from a *data capture sheet* into a database file created by the teacher. Carry out a *simple* search using the database. Select and interpret an appropriate graph. Save and retrieve work. Print work.	Computer, Prepared Database, Data Capture Sheet, Internet, CD ROMs, Resource books, Printer. Differentiated, focused tasks.

Assessment	Activity Notes
Pupils have the confidence to: Use the computer to produce *unedited, original work* to support and enhance class activities. Use images from a variety of sources to enhance the activity. Save and retrieve work unaided. Edit retrieved work by, for example, *deleting and inserting words, position headings and use text effects* and re-save. Print work. Use a greater range of tools to produce a picture. Save and retrieve work unaided. Make changes to their picture and re-save work. Print work. *Compose/arrange* a tune. Save and retrieve work unaided. Make changes to their tune and re-save work. Print work. Transfer their own findings from a *data capture sheet* into a database file created by the teacher. Carry out a *simple* search using the database. Select and interpret an appropriate graph. Save and retrieve work. Print work.	

Level 3

POS	Teaching and Learning Outcomes	Resources
2. Modelling	**Pupils, while implementing previously taught skills, will learn how to:**	
Adventure/Simulation	Explore an *appropriate* adventure or simulation making decisions and predicting the consequences of actions.	Computer, Adventure or Simulation Package, Internet. Differentiated, focused tasks.
Spreadsheet	Enter data into a prepared spreadsheet. Use built in formula such as sum. Change data and understand that the result in the formula cell will change. Choose data to be represented as a graph. Save and print work.	Computer, Spreadsheet Package, Printer. *Differentiated, focused tasks.*
LOGO	Enter commands to create shapes and patterns on the screen. Save and print work.	Computer, LOGO Package, Printer. Differentiated, focused tasks.

Assessment	Activity Notes
Pupils have the confidence to: Explore an *appropriate* adventure or simulation making decisions and predicting the consequences of actions. Enter data into a prepared spreadsheet. Use built in formula such as sum. Change data and understand that the result in the formula cell will change. Choose data to be represented as a graph. Save and print work. Enter commands to create shapes and patterns on the screen. Save and print work.	

Level 4

POS	Teaching and Learning Outcomes	Resources
1. Communicating and Handling Information ***Word Processing***	**Pupils, while implementing previously taught skills, will learn how to:** Use the computer to produce *unedited, original work* to support and enhance class activities. Insert images from a variety of sources into text. Move and resize images. Save and retrieve work unaided. Print work. Consider the layout of work and the intended audience. Edit retrieved work by, for example, *changing the layout, altering text, using text frames and text flows* and re-save. Send and receive e-mails. Enter addresses into the address book and use appropriately.	Computer, Word Processor/ DTP Package, Graphic images created by pupils, Clip Art, Internet, CD ROM images, Digital Camera, Scanner, Printer. *Differentiated, focused tasks.*
Graphics	Use *appropriate* tools to enhance their work. For example, the zoom facility to create extra detail in an area of their work. Load an image into the graphic package and make changes to it, for example, *changing colours, altering parts of the image.* Save and retrieve work unaided. Print work. Use saved images in a focused Word processing activity.	Computer, Appropriate Graphic Package, Digital Camera, Scanner, Internet, CD ROMs, Printer. *Differentiated, focused tasks.*
Music	*Compose/arrange* a piece of music containing several parts, for example, *melody, bass and rhythm.* Save and retrieve work unaided. Make changes to the music, for example, *changing the sound of the parts,* and re-save. Consider the structure of the music, for example, *using repeats.* Print work.	Computer, Music Package, Sound source, e.g. *Midi keyboard*, Printer. *Differentiated, focused tasks.*

Assessment	Activity Notes
Pupils have the confidence to: Use the computer to produce *unedited, original work* to support and enhance class activities. Insert images from a variety of sources into text. Move and resize images. Save and retrieve work unaided. Print work. Consider the layout of work and the intended audience. Edit retrieved work by, for example, *changing the layout, altering text, using text frames and text flows* and re-save. Send and receive e-mails. Enter addresses into the address book and use appropriately. Use *appropriate* tools to enhance their work. For example, the zoom facility to create extra detail in an area of their work. Load an image into the graphic package and make changes to it, for example, *changing colours, altering parts of the image.* Save and retrieve work unaided. Print work. Use saved images in a focused Word processing activity. *Compose/arrange* a piece of music containing several parts, for example, *melody, bass and rhythm.* Save and retrieve work unaided. Make changes to the music, for example, *changing the sound of the parts,* and re-save. Consider the structure of the music, for example, *using repeats.* Print work. Devise their own Data Capture sheet Transfer their findings from a *data capture sheet* into a database file. Check the accuracy of the information in the database file. Carry out a *complex* search using the database and list results. Select and interpret an *appropriate* graph. Save and retrieve work. Print work. Save appropriate graphs to use in a focused Word Processing activity. Use the Internet/CD ROMs to search for relevant information.	

Level 4

POS	Teaching and Learning Outcomes	Resources
2. Modelling	**Pupils, while implementing previously taught skills, will learn how to:**	
Adventure/Simulation	Explore an *appropriate* adventure or simulation making decisions and predicting the consequences of actions. Extract images from the software to be used, for example*, in a Word Processing or Database focused activity.*	Computer, Adventure or Simulation Package, Internet. Differentiated, focused tasks.
Spreadsheet	Decide what data is required. Decide on formula to be used. Set up the spreadsheet. Answer questions of the type: *What would happen if…?* Save and print work. Create graphs from selected data. Interpret and interrogate both the spreadsheet and associated graphs. Save graphs as images to be used in a Word Processor.	Computer, Spreadsheet Package, Printer. *Differentiated, focused tasks.*
LOGO	Repeat a procedure to create regular shapes and patterns *or* Repeat a procedure to rotate shapes. Explore areas such as tessellation, symmetry, and problem solving. Answer questions of the type: *What would happen if…?* Save, retrieve, amend and print work.	Computer, LOGO Package, Printer. Differentiated, focused tasks.

Assessment	Activity Notes
Pupils have the confidence to: Explore an *appropriate* adventure or simulation making decisions and predicting the consequences of actions. Extract images from the software to be used, for example*, in a Word Processing or Database focused activity.* Decide what data is required. Decide on formula to be used. Set up the spreadsheet. Answer questions of the type: *What would happen if…?* Save and print work. Create graphs from selected data. Interpret and interrogate both the spreadsheet and associated graphs. Save graphs as images to be used in a Word Processor. Repeat a procedure to create regular shapes and patterns *or* Repeat a procedure to rotate shapes. Explore areas such as tessellation, symmetry, and problem solving. Answer questions of the type: *What would happen if…?* Save, retrieve, amend and print work.	

Level 5

POS	Teaching and Learning Outcomes	Resources
1. Communicating and Handling Information	**Pupils, while implementing previously taught skills, will learn how to:**	
Word Processing	Use the computer to produce *a multimedia document* combining text, images and sound to support and enhance class activities. Save and retrieve work unaided. Consider the layout and the content of work for the intended audience. Edit work as *appropriate* and re-save. Send and receive e-mails with attachments. Print work if *appropriate*.	Computer, Word Processor/DTP/Authoring Package, Graphic images created by pupils, Clip Art, Internet, CD ROM images, Digital Camera, Scanner, Printer. *Differentiated, focused tasks.*
Graphics	Use *appropriate* graphic tools to *create/amend* an image for a specific purpose. Save and retrieve work unaided. Print work. Use saved images in focused Word Processing activities.	Computer, Appropriate Graphic Package, Digital camera, Scanner, Internet, CD ROMs, Printer. *Differentiated, focused tasks.*
Music	Use *appropriate* music software to record and sequence musical ideas for a specific purpose, using a range of sounds. Save and retrieve work unaided. Perform the music.	Computer, Music Package, Sound source, e.g. *Midi system*, Printer. *Differentiated, focused tasks.*
Data Handling	Devise their own Data Capture sheet, for a specific purpose, taking into account field types and layout. Devise an *appropriate* database file taking into account field types and layout. Transfer their findings from the *data capture sheet* into the database file. Save, retrieve and amend work. Check the accuracy of the information held in the database file. Sort and use *complex* searches using the database and list results. Select an *appropriate* graph and interpret findings. Print work. Save appropriate graphs and use in focused Word Processing activities. Use search engines *appropriately* to find information from World Wide Web sites.	Computer, Database Package, Internet, CD ROMs, Resource books, Newspapers etc., Printer. *Differentiated, focused tasks.*

Assessment	Activity Notes
Pupils have the confidence to: Use the computer to produce *a multimedia document* combining text, images and sound to support and enhance class activities. Save and retrieve work unaided. Consider the layout and the content of work for the intended audience. Edit work as *appropriate* and re-save. Send and receive e-mails with attachments. Print work if *appropriate*. Use *appropriate* graphic tools to *create/amend* an image for a specific purpose. Save and retrieve work unaided. Print work. Use saved images in focused Word Processing activities. Use *appropriate* music software to record and sequence musical ideas for a specific purpose, using a range of sounds. Save and retrieve work unaided. Perform the music. Devise their own Data Capture sheet, for a specific purpose, taking into account field types and layout. Devise an *appropriate* database file taking into account field types and layout. Transfer their findings from the *data capture sheet* into the database file. Save, retrieve and amend work. Check the accuracy of the information held in the database file. Sort and use *complex* searches using the database and list results. Select an *appropriate* graph and interpret findings. Print work. Save appropriate graphs and use in focused Word Processing activities. Use search engines *appropriately* to find information from World Wide Web sites.	

Level 5

POS	Teaching and Learning Outcomes	Resources
2. Modelling	**Pupils, while implementing previously taught skills, will learn how to:**	
Spreadsheet	Create a spreadsheet which simulates a real world application. Consider the layout of the spreadsheet. Use a greater range of formulae. Save and print work. Select an *appropriate* graph and interpret findings. Interpret and interrogate both the spreadsheet and associated graphs. Predict the outcomes of changing variables. Save *appropriate* data for inclusion in a Word Processing/DTP activity.	. Computer, Spreadsheet Package, Printer. *Differentiated, focused tasks.*
Simulation	Modelling can also be undertaken using a suitable simulation package, for example, *running a nuclear power plant,* as long as the package allows variables to be changed and outcomes of changes to be predicted.	Computer, Simulation Package, Printer. *Differentiated, focused tasks.*
LOGO	Incorporate sub-procedures to create more complex shapes and patterns. Explore areas such as tessellation, symmetry, and problem solving. Predict the outcomes of changing variables. Save, retrieve, amend and print work.	Computer, LOGO Package, Printer. Differentiated, focused tasks.

Assessment	Activity Notes
Pupils have the confidence to: Create a spreadsheet which simulates a real world application. Consider the layout of the spreadsheet. Use a greater range of formulae. Save and print work. Select an *appropriate* graph and interpret findings. Interpret and interrogate both the spreadsheet and associated graphs. Predict the outcomes of changing variables. Save *appropriate* data for inclusion in a Word Processing/DTP activity. Use a suitable simulation package, for example, *running a nuclear power plant,* as long as the package allows variables to be changed and outcomes of changes to be predicted Incorporate sub-procedures to create more complex shapes and patterns. Explore areas such as tessellation, symmetry, and problem solving. Predict the outcomes of changing variables. Save, retrieve, amend and print work.	

Level 6

POS	Teaching and Learning Outcomes	Resources
1. Communicating and Handling Information	**Pupils, while implementing previously taught skills, will learn how to:**	
Word Processing	Use the computer to produce *a presentation to a specific audience* combining text, images and sound to support and enhance class activities. Save and retrieve work unaided. Consider the structure, layout and content of work for the intended audience. Edit work as *appropriate* and re-save. Send and receive e-mails with attachments. Print work if *appropriate*.	Computer, Word Processor/DTP/Presentation Package, Graphic images created by pupils, Clip Art, Internet, CD Rom images, Digital camera, Scanner, Printer. *Differentiated, focused tasks.*
Graphics	Use *appropriate* graphic software and tools to *create/amend* a range of images for a specific purpose, for example, *showing the development of a company logo*. Save, retrieve and amend work unaided. Consider the size and colour scheme of the logo, for example, *appropriateness for letter heads, business cards etc*. Print work.	Computer, Appropriate Graphic Package, Digital camera, Scanner, Internet, CD ROMs, Printer. *Differentiated, focused tasks.*
Music	*Compose/arrange* a piece of music for a specific ensemble. Save, retrieve and amend work unaided. Make changes to the music, e.g. *transposing for specific instruments, balance* and re-save. Consider the structure of the music, e.g. *ternary form, rondo form*. Print individual parts for a performance.	Computer, Music Package, Sound Source, e.g. *Midi Keyboard*, Printer. *Differentiated, focused tasks.*
Data Handling	Collect a greater range of data for a specific purpose and devise a suitable data capture sheet. Transfer their data into a database file, taking into account field types, layout and checking the accuracy of the data. Save and retrieve work. Sort the data and use a range of *complex* searches using the database and list results. Select and interpret a range of graphs. Prepare a suitable report from the data. Print work. Export *appropriate* data for inclusion in a Word Processing/DTP activity. Use *appropriate* Internet based search engines to find supporting information for a specific task.	Computer, Database Package, Internet, CD ROMs, Resource books, Newspapers etc, Printer. *Differentiated, focused tasks.*

Assessment	Activity Notes
Pupils have the confidence to: Use the computer to produce *a presentation to a specific audience* combining text, images and sound to support and enhance class activities. Save and retrieve work unaided. Consider the structure, layout and content of work for the intended audience. Edit work as *appropriate* and re-save. Send and receive e-mails with attachments. Print work if *appropriate*. Use *appropriate* graphic software and tools to *create/amend* a range of images for a specific purpose, for example, *showing the development of a company logo*. Save, retrieve and amend work unaided. Consider the size and colour scheme of the logo, for example, *appropriateness for letter heads, business cards etc*. Print work. *Compose/arrange* a piece of music for a specific ensemble. Save, retrieve and amend work unaided. Make changes to the music, e.g. *transposing for specific instruments, balance* and re-save. Consider the structure of the music, e.g. *ternary form, rondo form.* Print individual parts for a performance. Collect a greater range of data for a specific purpose and devise a suitable data capture sheet. Transfer their data into a database file, taking into account field types, layout and checking the accuracy of the data. Save and retrieve work. Sort the data and use a range of *complex* searches using the database and list results. Select and interpret a range of graphs. Prepare a suitable report from the data. Print work. Save *appropriate* data for inclusion in a Word Processing/DTP activity. Use *appropriate* Internet based search engines to find supporting information for a specific task.	

Level 6

POS	Teaching and Learning Outcomes	Resources
2. Modelling	**Pupils, while implementing previously taught skills, will learn how to:**	
Spreadsheet	Create and test a spreadsheet which accurately simulates a real world application, for example, *a financial model.* Consider the design and layout of the spreadsheet. Create and test appropriate formulae. Save, retrieve and amend work. Create *appropriate* graphs from selected data. Interpret and interrogate both the spreadsheet and associated graphs. Predict the outcomes of changing variables and formulae. Verify and test changes. Print work. Save *appropriate* data for inclusion in a Word Processing/DTP activity.	*Computer, Spreadsheet Package, Printer.* *Differentiated, focused tasks.*
Simulation	Modelling can also be undertaken using a suitable simulation package, for example, *Running a Business*, as long as the package allows variables to be changed and the outcomes of changes to be predicted.	Computer, Simulation Package, Printer. *Differentiated, focused tasks*
LOGO	Use a greater range of procedures and sub-procedures to explore elements of geometry. Explore areas such as angle, area, congruency and problem solving. Predict the outcomes of changing variables. Save, retrieve, amend and print work.	Computer, LOGO Package, Printer. Differentiated, focused tasks.

Assessment	Activity Notes
Pupils have the confidence to: Create and test a spreadsheet which simulates a real world application, e.g. a financial model Consider the design and layout of the spreadsheet. Create and test appropriate formulae. Save and print work. Create graphs from selected data. Interpret and interrogate both the spreadsheet and associated graphs. Predict the outcomes of changing variables and formulae. Save *appropriate* data for inclusion in a Word Processing/DTP activity. Use a greater range of procedures and sub-procedures to explore elements of geometry. Explore areas such as angle, area, congruency and problem solving. Predict the outcomes of changing variables. Save, retrieve, amend and print work.	

Level 7

POS	Teaching and Learning Outcomes	Resources
1. Communicating and Handling Information ***Word Processing***	**Pupils, while implementing previously taught skills, will learn how to:** Use the computer and appropriate software to create a number of World Wide Web pages combining text, images and relevant elements (*e.g. targets, tables, music*) to support and enhance class activities. Save, retrieve and amend work unaided. Consider the style, structure, layout and content of work for the intended audience. Explore methods of allowing users to communicate information to the author. Share and exchange information by e-mail, using address books and attachments. Print work if *appropriate.*	Computer, Word Processor/DTP/HTML Editing Package, Graphic images created by pupils, Clip Art, Internet, CD Rom images, Digital camera, Scanner, Printer. *Differentiated, focused tasks.*
Graphics	Use *appropriate* graphic software and tools to *create/amend* a range of images, for example, *for use on World Wide Web pages, taking into account file types and file size.* Consider the use of effects such as *transparency* and *layers* when, for example, *creating collages, or multi-image pictures.* Save, retrieve and amend work unaided. Print work if *appropriate*.	Computer, Appropriate Graphic Package, Digital camera, Scanner, Internet, CD ROMs, Printer. *Differentiated, focused tasks.*
Music	Use *appropriate* music software to *compose/arrange* a piece of music for an ensemble *in a specific style.* Save, retrieve and amend work unaided. Make suitable changes to the music, e.g. *extending a middle section, adding a Coda* and re-save. Consider the structure of the music, e.g. *sonata form, song, 12 bar blues* Save and print individual parts. Perform the music, using the computer to supply any missing parts.	Computer, Music Package, Sound Source, e.g. *Midi Keyboard*, Printer. *Differentiated, focused tasks.*
Data Handling	Collect a diverse range of suitable data for a specific purpose. Verify and transfer their data into a database file, taking into account field types, layout and checking the accuracy of the data. Save, retrieve and amend work. Sort the data and interrogate the database using *appropriate* search techniques and display the results in a variety of styles. Select and interpret a wider range of suitable graphs. Prepare *appropriate* reports from the data. Print work. Save *appropriate* data/graphs for inclusion in a Word Processing/DTP activity. Use a range of Internet based search engines to refine and support information for a specific task. Explore methods of improving the quality and quantity of the results of Internet searches.	Computer, Database Package, Internet, CD ROMs, Resource books, Newspapers etc, Printer. *Differentiated, focused tasks.*

Assessment	Activity Notes
Pupils have the confidence to: Use the computer and appropriate software to create a number of World Wide Web pages combining text, images and relevant elements (*e.g. targets, tables, music*) to support and enhance class activities. Save, retrieve and amend work unaided. Consider the style, structure, layout and content of work for the intended audience. Explore methods of allowing users to communicate information to the author. Share and exchange information by e-mail, using address books and attachments. Print work if *appropriate.* Use *appropriate* graphic software and tools to *create/amend* a range of images, for example, *for use on World Wide Web pages, taking into account file types and file size.* Consider the use of effects such as *transparency* and *layers* when, for example, *creating collages, or multi-image pictures.* Save, retrieve and amend work unaided. Print work if *appropriate*. Use *appropriate* music software to *compose/arrange* a piece of music for an ensemble *in a specific style.* Save, retrieve and amend work unaided. Make suitable changes to the music, e.g. *extending a middle section, adding a Coda* and re-save. Consider the structure of the music, e.g. *sonata form, song, 12 bar blues* Save and print individual parts. Perform the music, using the computer to supply any missing parts. Collect a diverse range of suitable data for a specific purpose. Verify and transfer their data into a database file, taking into account field types, layout and checking the accuracy of the data. Save, retrieve and amend work. Sort the data and interrogate the database using *appropriate* search techniques and display the results in a variety of styles. Select and interpret a wider range of suitable graphs. Prepare *appropriate* reports from the data. Print work. Save *appropriate* data/graphs for inclusion in a Word Processing/DTP activity. Use a range of Internet based search engines to refine and support information for a specific task. Explore methods of improving the quality and quantity of the results of Internet searches.	

Level 7

POS	Teaching and Learning Outcomes	Resources
2. Modelling	**Pupils, while implementing previously taught skills, will learn how to:**	
Spreadsheet	Create and test a spreadsheet which simulates a real, specific application, for example, *running a business or tracking stocks and shares prices.* Consider the structure, design and layout of the spreadsheet.	*Computer, Spreadsheet Package, Printer.* *Differentiated, focused tasks.*
	Create and test *appropriate* formulae using both *absolute* and *relative* cell relationships. Save, retrieve, amend and print work. Create *appropriate* graphs from selected data. Interpret and interrogate both the spreadsheet and associated graphs. Predict the outcomes of changing variables and formulae.	
	Use *appropriate* data for a mail-merging activity in a Word Processor/DTP package.	
Simulation	Modelling can also be undertaken using a suitable simulation package, for example, *Running a Business*, as long as the package allows variables to be changed and the outcomes of changes to be predicted.	Computer, Simulation Package, Printer. **Differentiated, focused tasks**
LOGO/ **Dynamic Geometry**	Use a greater range of functions to explore elements of geometry. Explore areas such as scale, transformation of 2-D and 3-D shapes, coordinates, loci and problem solving. Predict the outcomes of changing variables. Save, retrieve, amend and print work.	Computer, LOGO Package, Dynamic Geometry Package, Printer. Differentiated, focused tasks.

Assessment	Activity Notes
Pupils have the confidence to: Create and test a spreadsheet which simulates a real, specific application, for example, *running a business or tracking stocks and shares prices.* Consider the structure, design and layout of the spreadsheet. Create and test *appropriate* formulae using both *absolute* and *relative* cell relationships. Save, retrieve, amend and print work. Create *appropriate* graphs from selected data. Interpret and interrogate both the spreadsheet and associated graphs. Predict the outcomes of changing variables and formulae. Use *appropriate* data for a mail-merging activity in a Word Processor/DTP package. Modelling can also be undertaken using a suitable simulation package, for example, *Running a Business*, as long as the package allows variables to be changed and the outcomes of changes to be predicted. Use a greater range of functions to explore elements of geometry. Explore areas such as scale, transformation of 2-D and 3-D shapes, coordinates, loci and problem solving. Predict the outcomes of changing variables. Save, retrieve, amend and print work.	

Level 8

POS	Teaching and Learning Outcomes	Resources
1. Communicating and Handling Information ***Word Processing***	**Pupils, while implementing previously taught skills, will learn how to:** Use the computer and appropriate software to create a range of documents which support and enhance a large scale project, for example, *reports, letters, posters, invoices and web pages for a school production.* Save, retrieve and amend work unaided. Consider the style, structure, layout and content of work for a range of audiences. Explore methods for effective typesetting on a range of media. Explore methods of allowing users to access specific information regarding the project. Share and exchange information by e-mail or web-based forms. Print work or prepare for typesetting.	Computer, Word Processor/DTP, HTML Editor, Graphic images created by pupils, Clip Art, Internet, CD Rom images, Digital camera, Scanner, Printer. *Differentiated, focused tasks.*
Graphics	Use *appropriate* graphic software and tools to *create/amend* a range of images, for example, *for use in a range of publicity material ,or for effective typesetting at a range of sizes on different media.* Consider the use of effects such as *sharpening, filtering, duotones and soft focusing.* Save/export, retrieve and amend work unaided as appropriate file types. Print work or prepare for typesetting.	Computer, Appropriate Graphic Package, Digital camera, Scanner, Internet, CD ROMs, Printer. *Differentiated, focused tasks.*
Music	Use *appropriate* music software to *compose/arrange* a piece of music for a large ensemble *in a specific style.* Save, retrieve and amend work unaided. Explore a wider range of musical elements within the music, for *example diminution, augmentation, pedal points, a variety of cadences, texture, lyrics.* Consider the overall structure of the piece, e.g. *more than one movement, through-composed.* Save and print individual parts. Perform the music, using the computer to supply any missing parts.	Computer, Music Package, Sound Source, e.g. *Midi Keyboard*, Printer. *Differentiated, focused tasks.*
Data Handling	Analyse a problem then design a database system which demonstrates the best solution, e.g. *keeping track of tickets sold at an event in relation to seat availability.* Verify and transfer data into a suitable database file, taking into account field types, layout and checking the accuracy of the data. Save, retrieve and amend work. Ensure that the system is thoroughly documented so that someone else could easily use it. Sort the data and interrogate the database using *appropriate* search techniques and display the results in a variety of styles. Select and interpret a wider range of suitable graphs. Prepare *appropriate* reports from the data. Print work. Save *appropriate* data/graphs for inclusion in a Word Processing/DTP activity. Use a range of Internet based search engines to refine and support information for a specific task. Explore methods of improving the quality and quantity of the results of Internet searches and document the information for use by others.	Computer, Database Package, Internet, CD ROMs, Resource books, Newspapers etc, Printer. *Differentiated, focused tasks.*

Assessment	Activity Notes
Pupils have the confidence to: Use the computer and appropriate software to create a range of documents which support and enhance a large scale project, for example, *reports, letters, posters, invoices and web pages for a school production.* Save, retrieve and amend work unaided. Consider the style, structure, layout and content of work for a range of audiences. Explore methods for effective typesetting on a range of media. Explore methods of allowing users to access specific information regarding the project. Share and exchange information by e-mail or web-based forms. Print work or prepare for typesetting. Use *appropriate* graphic software and tools to *create/amend* a range of images, for example, *for use in a range of publicity material ,or for effective typesetting at a range of sizes on different media.* Consider the use of effects such as *sharpening, filtering, duotones and soft focusing.* Save/export, retrieve and amend work unaided as appropriate file types. Print work or prepare for typesetting. Use *appropriate* music software to *compose/arrange* a piece of music for a large ensemble *in a specific style.* Save, retrieve and amend work unaided. Explore a wider range of musical elements within the music, for *example diminution, augmentation, pedal points, a variety of cadences, texture, lyrics.* Consider the overall structure of the piece, e.g. *more than one movement, through-composed.* Save and print individual parts. Perform the music, using the computer to supply any missing parts Analyse a problem then design a database system which demonstrates the best solution, e.g. *keeping track of tickets sold at an event in relation to seat availability.* Verify and transfer data into a suitable database file, taking into account field types, layout and checking the accuracy of the data. Save, retrieve and amend work. Ensure that the system is thoroughly documented so that someone else could easily use it. Sort the data and interrogate the database using *appropriate* search techniques and display the results in a variety of styles. Select and interpret a wider range of suitable graphs. Prepare *appropriate* reports from the data. Print work. Save *appropriate* data/graphs for inclusion in a Word Processing/DTP activity. Use a range of Internet based search engines to refine and support information for a specific task. Explore methods of improving the quality and quantity of the results of Internet searches and document the information for use by others.	

Level 8

POS	Teaching and Learning Outcomes	Resources
2. Modelling	**Pupils, while implementing previously taught skills, will learn how to:**	
Spreadsheet	Analyse a given problem, then create and test a series of spreadsheets which provide an appropriate solution, for example, *running a point of sales system*. Consider the structure, design, layout and links between the spreadsheets.	*Computer, Spreadsheet Package, Printer.* *Differentiated, focused tasks.*
	Create and test *appropriate* formulae using both *absolute* and *relative* cell relationships between the spreadsheets. Use one of the spreadsheets to act as an invoicing system for the model. Save, retrieve, amend and print work. Create *appropriate* graphs from selected data. Interpret and interrogate both the spreadsheet and associated graphs. Predict the outcomes of changing variables and formulae.	
	Produce statistical data from the spreadsheets.	
	Evaluate the usefulness of the model and document it thoroughly for others to use.	
	Use *appropriate* data for a mail-merging activity in a Word Processor/DTP package.	
Simulation	Modelling can also be undertaken using a suitable simulation package, for example, *Running a Business*, as long as the package allows variables to be changed and the outcomes of changes to be predicted.	Computer, Simulation Package, Printer. **Differentiated, focused tasks**
LOGO/ ***Dynamic Geometry***	Use a greater range of functions to explore elements of geometry and trigonometry. Explore areas such as, transformation of 2-D and 3-D shapes, polygons, congruency and symmetry. Predict the outcomes of changing variables. Save, retrieve, amend and print work.	Computer, LOGO Package, Dynamic Geometry Package, Printer. Differentiated, focused tasks.

Assessment	Activity Notes
Pupils have the confidence to: Analyse a given problem, then create and test a series of spreadsheets which provide an appropriate solution, for example, *running a point of sales system.* Consider the structure, design, layout and links between the spreadsheets. Create and test *appropriate* formulae using both *absolute* and *relative* cell relationships between the spreadsheets. Use one of the spreadsheets to act as an invoicing system for the model. Save, retrieve, amend and print work. Create *appropriate* graphs from selected data. Interpret and interrogate both the spreadsheet and associated graphs. Predict the outcomes of changing variables and formulae. Produce statistical data from the spreadsheets. Evaluate the usefulness of the model and document it thoroughly for others to use. Use *appropriate* data for a mail-merging activity in a Word Processor/DTP package Modelling can also be undertaken using a suitable simulation package, for example, *Running a Business*, as long as the package allows variables to be changed and the outcomes of changes to be predicted. Use a greater range of functions to explore elements of geometry and trigonometry. Explore areas such as, transformation of 2-D and 3-D shapes, polygons, congruency and symmetry. Predict the outcomes of changing variables. Save, retrieve, amend and print work.	

Applications and Effects of ICT

Pupils should be given opportunities to:

explore the use of computer systems in everyday life *e.g. encourage the children to talk about their experiences of using a computer at school or at home. Raise pupil awareness that computers and other electronic devices such as, microwaves, televisions, robots, sensors, automatic doors etc. are used in many places.*

examine and discuss their experiences of ICT, and look at the use of ICT in the outside world *e.g. encourage the children to compare work produced on the computer with work produced in a more traditional way, such as comparing a graphic picture with a painting, or a word processed document with a hand-written document. Raise pupil awareness that ICT is used effectively in the world, such as the use of graphics and animations within the media, the use of ICT in the production of greeting cards.*

Key Stage 2

Pupils should be given opportunities to:

discuss their experiences of using ICT and assess its value in their working practices *e.g. pupils make comparisons and judgements on their use of ICT, such as comparing graphs plotted through a database to graphs drawn in a traditional way and deciding which are the most effective, using a desktop publishing package to create a newspaper and making a judgement on different styles and layout.*

investigate the use of ICT in the wider world, consider the effects of such uses and compare them with other methods. *e.g. raise pupil awareness regarding the use of the Internet and* e-commerce as a modern means of shopping, comparing the use of digital cameras with traditional photography, accessing the Internet through modern digital televisions.

Key Stage 3
Pupils should be given opportunities to:

work with different kinds of information considering how its characteristics influence its use, *e.g. pupils should be able to decide whether information needs to be entered into a database or a spreadsheet.*

consider the limitations of ICT tools and information sources, they provide, and compare their effectiveness and efficiency with other methods of working, *e.g. pupils should know when a given task is best undertaken with a word processor or a desktop publishing package, having considered the content, layout and audience.*

discuss some of the social, economic ethical and moral issues raised by ICT, *e.g. the use of computer controlled robots in the auto manufacturing process which could result in the loss of employment or the increase of Internet based shopping leading to a possible reduction of high street stores, loss of privacy through a rapid increase in the use of databases.*

Classroom Strategies for Communicating

The aim of using a Word Processor is to provide pupils with opportunities to enter, store and print pages of text using a computer. Modern Word Processors have Desktop Publishing facilities. Desktop Publishing (DTP) is the combining of text /graphics and layout to produce a finished product.

Examples of using Word Processing /DTP:

A piece of news or a report e.g. *a science activity, or a mathematical investigation;*

A poem with graphics to enhance the poem;

A collaborative story with graphics;

A newspaper page with columns and text flows;

A poster e.g. *advertising a school event, a WW2 poster;*

Screen based worksheets;

Cross curricular work using images or text taken from a CD-ROM e.g. *to support a topic on Mini beasts or Tudors;*

Cross curricular work using images or text taken from the Internet e.g. *supporting an historical person of prominence such as Florence Nightingale;*

A newspaper/document/booklet with multiple pages;

Preparing e-mails e.g. *to other classes/schools or authors/experts;*

Preparing e-mail with attachments;

Internal school web page/site;

External school web site.

The above are just some of the ways in which a Word Processing/DTP package can be used to support and enhance classroom activities. Tasks need to be carefully planned, identifying the IT skills. It is important to remember that the pupils do not all have to do the same tasks; different tasks can be set which address similar IT skills.

When the task has been planned, the IT skills need to be demonstrated to the pupils. This can be done to the whole class initially, reinforcing to individuals as necessary. When Word Processing/DTP, pupils need to consider two important issues:

the layout of the work, and

the audience.

Pupils should think through the task while at the computer, entering text directly, not re-typing from a hand written version. They should be encouraged to save work regularly, finally printing it out, in order that they read through to assess whether any changes need to be made.

Combining images and text enhances a piece of work. Images can be obtained from *Clip Art* files, or extracted from CD-ROMs or World Wide Web pages. Suitable adult supervision is required when using the Internet. Relevant web sites should be researched prior to the pupils using them and then *book marked* to make future access quicker.

When a new theme/topic is introduced, pupils could gather suitable images and save them to a shared area. When working on a Word Processing/DTP task, pupils can then retrieve the images

and paste them into the text. Overuse of images may spoil the overall appearance of the work. Examples could be shown demonstrating good practice.

Once pupils are confident in combining images and text, they need to be shown how to manipulate images, resizing and moving them to gain the best effect.

Another method of communicating is through the use of electronic mail. With any use of the Internet there needs to be suitable adult supervision. Pupils should be shown how to send and receive e-mails; initially this could be done between classes within the school. The teacher should make the initial connection to external e-mail addresses. Pupils should be encouraged to check their mail, replying as necessary.

E-mail activities should be linked to current themes/topic discussing the format of letter writing. With experience, pupils can be taught how to send attachments and set up mail groups so that the same message is sent to several people at the same time.

At all times, teachers must be vigilant and consider all safety aspects when pupils are working at the computer. It is important to ensure that:

there are no trailing cables, either on the work surface, or on the floor beneath the computer trolley, and

pupils are comfortably seated at the computer i.e. the chairs are neither too low nor too high.

Assessment of pupils' work should be in line with the school policy. When assessing collaborative work, it is accepted that assessment can be carried out through:

questioning pupils;

a printout of pupil's work;

saving pupils' files to disc;

discussing outcomes with pupils; this should identify individual children's contribution to the activity.

Classroom Strategies for Data Handling

What is Data Handling?

Data Handling is the sorting and classifying of information or facts, in order to establish patterns and draw conclusions.

What is a Database?

A Database is a collection of information that is organised and stored for a purpose. In computer terms, a Database is an application that will allow information to be stored, retrieved, interrogated, interpreted and presented.

The aim of **Data Handling** is to provide pupils with the experience of using and applying a variety of interrogation techniques, i.e. through simple and complex questions. Graphs can be plotted from the data, which can then be interpreted. Pupils should spend as short a time as possible entering information into a database. If the program has a *Key Word* facility that enables information to be entered quickly, this should be used.

Topics or themes which lend themselves to the collection of information include:
- The Weather
- A study of homes
- A study of living things
- An ourselves project
- A study of transport
- A study of materials
- Change
- Mathematical shapes

Using a Database

If studying *Homes,* pupils may have carried out a comparison of houses in a terraced row. They probably would have been given a questionnaire, produced by the teacher, which would focus pupils' observations in a particular way. For example*, observing and recording the different materials used for the walls, windows and doors etc.* The questionnaire would probably contain too much information to enter into a database.

The teacher needs to think very carefully about the reasons for using a database. What type of information is likely to be required? What sort of graphs would be plotted from the information entered into the database? This is the time, perhaps, to *brainstorm* with the pupils about the information required.

The number of **Fields** (headings) you would wish to use will depend on the ages, abilities and past experiences of the pupils. Once a decision on the number and wording of each **Field** has been made, the Database can be constructed. The use of the *Key Word* facility should be used to enable pupils to enter their collected information quickly and easily into the Database.

A *Data Capture Sheet* must be created once the Database has been constructed. A *Data Capture Sheet* must have *Field Names*, which correspond to those in the Database. If working with younger or less able pupils, the expected range of responses could be put on the *Data Capture Sheet* so that the pupils can either draw a circle around the correct response or cross out those which are not applicable.

Pupils can transfer the selected information from the original questionnaire sheet that was used on the field trip onto the *Data Capture Sheet*.

When all the *Data Capture Sheets* have been completed, the pupils will need to be shown how to copy the information into the teacher prepared Database, how to use the *Key Word* facility, and how to save and retrieve the Database.

This demonstration can be to:

the whole class, which would save on teaching time, or
a group of pupils who could then become *pupil tutors*

Similar methods can be employed to demonstrate to pupils how to interrogate the database using either *simple* or c*omplex* questions. Teachers should prepare differentiated, focused worksheets that will allow pupils to interrogate the database according to their abilities or previous experiences. Pupils can either:

handwrite their findings or print out graphs;

write their interpretations of the graph;

save out the graph as an image to insert into a Word Processor in order to write about their interpretations;

print out the work and either use the printout for display or to place in a pupil workbook/file.

At all times, teachers must be vigilant and consider all safety aspects when pupils are working at the computer. It is important to ensure that:

there are no trailing cables, either on the work surface or on the floor beneath the computer trolley, and,

pupils are comfortably seated at the computer, i.e. the chairs are neither too low nor too high.

Assessment of pupils' work should be in line with the school policy. When assessing collaborative work it is accepted that assessment can be carried out through:

questioning the pupils;
a printout of pupil work;
saving pupils' files to disc;
discussing outcomes with pupils: this should identify individual children's contributions to the activity.

Classroom Strategies for Spreadsheets

What is a Spreadsheet?

A *Spreadsheet* is a computer program that allows text, numbers or formulae to be entered into cells in a grid format. The cells can be linked together by formulae, so that altering numbers in one cell will produce a different result in another.

Spreadsheets can be used to support themes/topics where pupils collect data and would like to test hypotheses of the type: *What would happen if...?* Information from the Spreadsheet can be displayed as a graph/chart.

The aim of using Spreadsheets is to provide pupils with the understanding and experience of using and applying mathematical formulae, and plotting graphs to display suitable information that can then be interpreted. Pupils should spend as short a time as possible entering the information into the spreadsheet. If the program has a facility, which enables information/formulae to be entered quickly, then this should be used.

Examples of using a Spreadsheet:

Weather averages: enter rainfall data etc. and then use a formula to work out total or average rainfall; graphs could be used to show days where there was above or below average rainfall.

If the topic is *All About Me*, pupils could measure various body parts or height etc and use the Spreadsheet to find who is above or below the average size. Investigate to find out whether the time of year born has anything to do with the differences.

Making puppets: pupils measure their own body parts and then use formulae to scale body parts to 1/10 or 1/30. Puppets can then be constructed with accurate proportions.

School tuck shop: purchasing costs; selling on costs and profit.

Building a house: enter all material and unit costs, then use formulae to calculate the subtotal cost and work out the overall total.

Cake making: enter the ingredients needed for one cake and then, using formulae, calculate the ingredients needed for 36 or 56 cakes.

The teacher needs to think very carefully about the reasons for using a spreadsheet. Maybe a mathematical investigation supporting the topic on *Ourselves* could be used to prove or disprove the saying *I am 2.5 times taller than my head circumference*. Consider the type of information likely to be entered. What will the data be used for – comparison, averages, less than, more than? What sort of graphs would be plotted from the information entered into the spreadsheet? This is the time, perhaps, to *brainstorm* with the pupils about the types of information required.

A questionnaire/table could be used to focus the activity and ensure that all pupils were collecting the same data.

The number of *Labels, (column headings),* you would consider using would depend on the ages, abilities and past experiences of the pupils. Once a decision on the number of Labels and the wording for each Label has been made, the Spreadsheet can be constructed. The pupils will need to be shown how to enter the information into the program, how to use the *Copy/Fill* facility, and how to save and retrieve.

This demonstration can be to:

the whole class, which would save on teaching time, or

a group of pupils who could then become *pupil tutors*.

Pupils can then transfer the information from the original questionnaire into the spreadsheet. The *Copy/Fill* facility should be used to enable pupils to quickly and easily enter information into the spreadsheet.

Similar methods can be employed to demonstrate to pupils how to use formulae to perform calculations on the data, and how to create graphs based on that data.

Teachers should prepare differentiated, focused worksheets that will allow pupils to investigate the spreadsheet. Pupils can write their findings either onto a question sheet, or alternatively, on a Word Processor where graphs can be inserted. Printed work can either be used for display or placed in a pupil workbook/file.

Tasks should be developed from prescribed to open-ended. This will offer support to pupils in the early stages of using spreadsheets, and lead to increasingly challenging investigations by the more able pupils, as they become proficient with the program.

At all times, teachers must be vigilant and consider all safety aspects when pupils are working at the computer. It is important to ensure that:

there are no trailing cables, either on the work surface or on the floor beneath the computer trolley, and

pupils are comfortably seated at the computer, i.e. the chairs are neither too low nor too high.

Assessment of pupils' work should be in line with the school policy. When assessing collaborative work it is accepted that assessment can be carried out through:

questioning the pupils;

a printout of pupil's work;

saving pupils' files to disc;

discussing outcomes with pupils; this should identify individual children's contribution to the activity.

Classroom Strategies for LOGO

What is LOGO?

LOGO is part of the **Modelling** strand of ICT. Through the use of a simple programming language, LOGO, commands can be entered via the keyboard to control an on-screen turtle. Pupils can create and transform shapes; creating 2-D shapes by describing their properties in the form of a sequence of instructions specifying units of length and angles.

LOGO can be used to support mathematical themes/topics where the notion of direction, shape and angle are explored. Numeracy skills developed will include the use of: *number; distance; shape; angles, estimation* and *problem solving*. Investigative work is possible of the type: "*What would happen if…?*"

Literacy skills involve the organisation of thoughts through a sequence of instructions to create simple procedures for a particular purpose, correct use of mathematical terminology and using the language of LOGO. Children work collaboratively to discuss work and overcome problems.

Geography is also supported through exploring the *world* of the turtle

Using LOGO

The aim of using LOGO is to provide pupils with the understanding and experience of using a simple programming language to create and transform 2-D shapes by describing their properties in the form of a sequence of instructions specifying units of length and angles.

Examples of using LOGO:

Move the screen turtle on a *random* journey using right angles.

Move the screen turtle on a *pre-planned* journey using right angles. Estimation skills can be developed by helping the turtle find its way out of a maze, directing the turtle to a variety of objects on screen, etc.

Move the screen turtle in order to carry out a specific task, such as creating two or more squares to build up patterns. In this way symmetrical and tessellating patterns can be created, explored and investigated. Concepts such as a half right angle and further angle turns can be introduced.

Explore the properties of regular and irregular shapes through length and angle turns. Regular shapes such as squares, equilateral triangles, hexagons etc. can be created using **Repeat** commands.

Develop procedures to produce a turtle picture consisting of a number of sub-procedures, e.g. *a robot.*

Create more complex procedures involving numerous sub-procedures and repeat commands in order to produce spectacular patterns by rotating shapes through 360 degree turns, e.g. *creating a shape, turning the turtle 36 degrees and repeating 10 times*. Multiplication patterns can be investigated in this way.

Investigate ready-made complex procedures to create different effects, predict outcomes and ask questions of the nature: *What would happen if…?*

The teacher needs to think very carefully about the reasons for using LOGO and also to decide on the most appropriate time to use it. LOGO should be planned to support mathematical themes or topics involving; number, distance, shape, angles, estimation and problem solving, or exploring a scene to support work in geography.

The most important aspect from the teacher's point of view is to decide on the desired learning outcomes and to plan the focused tasks/activities accordingly, taking into account varying pupil needs through differentiation. Consideration must also be given to any previous experience/knowledge of the pupils. The teacher must be clear at the very outset, of the learning objectives, (both subject supported and IT skills should be identified) as this is vital to enable assessment of pupil attainment. This, in turn, should be used to inform future short term planning as some children will need reinforcement while others extension activities.

The focus could be on any one or more of the areas listed above, e.g. *the exploration and investigation of **shape** and **angles**.* The desired learning outcome could be that the pupils understand the concept of a regular shape having all sides the same length and all angles the same size (maths) and can use the **Repeat** command to create a regular shape (IT). An extension to this could be using a further **Repeat** command to rotate the shape through 360 degrees creating a spectacular pattern. This could lead to an investigation of the type: *What would happen if...?* by changing the size of the sides, angles or number of **Repeats** in the rotation.

Depending on age, abilities and previous knowledge, the pupils will need to be shown how to use LOGO. This can be achieved through a series of demonstrations that illustrate the various aspects of the software, reinforcing to individuals as necessary.

This demonstration can be to:

- the whole class, which would save on teaching time, or

- a group of pupils who could then become *pupil tutors.*

LOGO is effective when used collaboratively, so pupil groupings will need to be planned appropriately for the task in-hand. This will allow pupils to discuss, plan, and overcome problems that may occur. Care should be exercised when creating groups to ensure that every pupil has the opportunity to make a worthwhile contribution to the activity. Different tasks may mean different groupings, e.g. groups of like ability, or a more able pupil may be used as a prompt for less able pupils (providing that they understand that they are there to help and not to complete the task).

When printing the completed work, the procedure should also be printed out so that it can be used by the pupils to evaluate their solution (there will often be more than one way of completing a task and there could be an investigation built around a variety of solutions). Printed work can be used for display, placed in pupil workbooks/files or used to stimulate further investigations.

Pupils can write about their investigations in a word processor and insert their pattern or shape into the text.

Tasks should be developed from prescribed to open-ended. This will offer support to pupils in the early stages of using LOGO, and lead to more challenging investigations by the more able pupils as they become more familiar with the program.

At all times the teacher must be vigilant and consider all safety aspects when pupils are working at the computer. It is important to ensure that:

there are no trailing cables either on the work surface, or on the floor beneath the
     computer trolley, and

pupils are comfortably seated at the computer, i.e. the chairs are neither too low nor too high.

Assessment of pupil's work should be in line with the school policy. When assessing collaborative work it is accepted that assessment can be carried out through:

questioning the pupils;

a printout of pupil's work;

saving pupils' files to disc;

discussing outcomes with pupils; this should identify individual children's contribution to the activity.

Classroom Strategies for Robotic Toys

Using Robotic toys

The aim of using a Robotic toy is to provide pupils with the understanding and experience of controlling a device through the use of a simple key pad to enter a sequence of LOGO-like commands which make the Robotic toy move.

Examples of using Robotic toys:

- send the Robotic toy on a random journey in order to become familiar with using the keypad;
- send the Robotic toy to a friend; through trial and error they could talk about needing a bigger or smaller number and begin to predict distance;
- send the Robotic toy on a planned journey e.g. *to the large yellow teddy bear or the small blue teddy bear etc;*
- use a *number line* to explore number bonds to ten, or *counting on* and *counting back* to aid addition and subtraction skills;
- children can use a Robotic toy to check their answers e.g. *after completing simple addition and subtraction tasks;*
- send a dressed Robotic toy to re-tell a story e.g. *dressed as a wolf the robotic toy could visit the houses of the three little pigs in the correct sequence;*
- draw lines and shapes on a large sheet of paper;
- work out a sequence of instructions, in order to record in pictorial format the journey, e.g. *to the red circle, the blue square or the yellow triangle etc;*
- knock down skittles to identify, e.g. *colours, shapes or add up the numbers on the fallen skittles etc;*
- avoid obstacles placed in the path of the Robotic toy.

The teacher needs to think very carefully about the reasons for using a Robotic toy and also to decide on the most appropriate time to use it. Robotic toys lend themselves to support themes or topics, many of which involve: *sequencing, number, distance, shape, colour, re-telling a story, exploring a scene, developing a character to send on a journey or to move around objects, etc.*

The most important aspect from the teacher's point of view, is to decide on the desired learning outcomes and to plan the focused tasks/activities accordingly, taking into account varying pupil needs through differentiation. The teacher must be clear at the very outset, of the learning objectives, (both the area to be supported and the IT skills should be identified) as this is vital to enable assessment of pupil attainment. This, in turn, should be used to inform future short term planning, as some children will need reinforcement while others may need extension activities.

Taking into account previous experience, pupils will need to be shown how to use the Robotic toy. This can be achieved through a demonstration to the whole class, illustrating the various movements created in response to the keypad commands. This can be reinforced to individuals as necessary. Such demonstrations can be very effective for language development, e.g. *how far? greater than, less than, further, bigger, smaller, turn, forwards, backwards etc.* and the development of numeracy skills through using numbers or counting keypad presses.

Robotic toys are effective when used collaboratively, so pupil groupings will need to be planned appropriately for the task in-hand. This will allow pupils to talk about, share and learn to co-operate as they experience the tasks set by the teacher, or set by themselves, as they work out how to make the Robotic toy move. Care should be exercised when creating groups to ensure that every pupil has the opportunity to make a worthwhile contribution to the activity. Different tasks may mean different groupings, e.g. groups of like ability, or a more able pupil may be used as a prompt for less able pupils.

Children will need to be supervised by an adult while using Robotic toys so that suitable questions can be asked and children challenged. Short, frequent sessions are best to keep the children stimulated and interested in the task given.

Photographs and/or pupil drawings are a good record of activities and provide further opportunities for discussion. They could be mounted as part of a display, providing a further stimulus for language development.

At all times the teacher must be vigilant and consider all safety aspects when pupils are working with Robotic toys. It is important to ensure that:

- the floor area to be used is nowhere near the sand and water;
- there is a safe distance between the children involved in the activity and those who are not, to avoid children falling over the Robotic toy or the children programming it;
- the charger is unplugged and put away after use.

Assessment of pupil's work should be:

- in line with the Teaching Objectives;
- through observation;
- through discussion with the child;
- in line with the schools Early Years Assessment Policy.

When assessing collaborative work it is accepted that assessment can be carried out through observation and interrogating the pupils.

Discussing outcomes with pupils: This should identify individual children's contribution to the activity.

Classroom Strategies For Graphics

What is graphics?

Graphics enables you to work in the Creative Development area. Graphic packages allow the pupil to create pictures using a range of tool. Using a graphics package enables pupils to express themselves pictorially. Pupils will learn to use a range of basic tools, while developing fine motor skills and hand to eye co-ordination. Graphics packages can be used to enhance all areas of the Curriculum.

Examples of using Graphics:

- to experiment with shape, colour and patterns;
- to teach shapes;
- to reinforce colour awareness;
- to produce a self portrait;
- to draw a picture linked to a story, an activity or related to the theme;
- to create a picture encouraging use of tools;
- to describe an image and ask the child to draw it on screen.
- to produce class picture books/multi media books
- to alter images from Digital Camera, CDROM or Internet

Using a Graphic Package

The aim of using a Graphics package is to provide pupils with a different medium to express themselves pictorially, to develop new skills and familiarise them with basic tools found in most graphic packages, while developing the pupil's fine motor skills and hand to eye co-ordination.

Graphics packages can be used to enhance all areas. The teacher must be clear on the reasons for using the software, is the task set appropriate to the pupil's needs and past experiences, are the learning outcomes relevant.

All tasks need to be planned carefully so that each pupil works at his own level and develop new skills appropriately. The teacher must have clear aims for use of the software and what the desired outcomes will be, this in turn will aid assessment and help plan the next steps. Some children might quickly master basic skills while others will need time and lots more meaningful activities to consolidate skills and concepts.

The pupils will need to be shown how to use the software this can be achieved by a class demonstration and then reinforced in small groups or in pairs. It is one of the few computer activities where pupils need to work alone. It is often necessary for young children to work individually and then progress to working in pairs helping each other. The teacher needs to be aware of personalities when setting pupils to work together.

It is often a good idea to place a more able pupil to support another but friendship groups also work well. Paired and group work will also give opportunity for language development and improve social skills.

It is essential that the teacher makes it clear to the children what is expected and demonstrates the task before they begin. The teacher should also give the pupils time to talk about their picture and how they made it, this will enable the teacher to assess the pupil's skills and plan the next stage Use of a graphics package will also lend itself to develop use of appropriate mathematical vocabulary e.g. when talking about brush colour, size, length of line shape etc.

Display of children's work should be encouraged and talked about with the pupils in a meaningful situation, all children should be given equal opportunity to use the software and contribute to the lesson at a level suitable to them

At all times the teacher must be vigilant and consider all safety aspects when pupils are working at the computer. It is important to ensure:

- there are no trailing cables, either on the work surface or on the floor beneath the computer station,
- pupils are seated comfortably at the computer, i.e. chairs are a suitable height.

Assessment of the pupil's work should be through observation and discussion with the child.

Classroom Strategies for Adventures and Simulations

What are Adventures and Simulations?

Adventures and Simulations address the *Modelling* area of ICT. They are computer representations of imaginary or real situations that are governed by a set of rules. These rules can vary greatly from simplistic to highly complex levels.

Adventures are programs based on imaginary situations. Users of adventures become involved in a role-playing situation where they either become the main character or help other characters within the adventure. Adventures usually involve quests that entail using clues, collecting various objects, using objects at appropriate places and problem solving.

Younger pupils will be more inclined to use simple adventures that have limited choices. These adventures allow pupils to move through the tasks in a linear fashion. Progress through linear adventures is confined to pupils solving individual problems at appropriate stages. The problems posed within the adventures usually support literacy and numeracy. Simple adventures have options that provide different levels of difficulty for users. This is a useful facility when catering for pupil groups with a wide range of abilities.

Older or more able pupils should use more complex adventures that offer them a greater range of choices. Users have greater control of situations such as selecting locations on a map or choosing equipment. Variables can also occur that change outcomes.

Simulations are programs that *simulate* a real situation within the confines of a computer model. Users of simulations are confronted with real life situations that provide investigation opportunities. Within certain simulations, parameters may be altered which change the overall outcomes.

Younger pupils can use very simple simulations that reflect the activities that they would normally carry out in real life. More able, or older pupils, should become involved in increasingly complex simulations that provide more information, which allow users to become actively involved as characters within the simulation.

Adventures and Simulations offer opportunities for collaborative activities that help pupils to appreciate the relationship between cause and effect. Adventure and simulation packages are powerful modelling applications that encourage pupils to design strategies and pose questions of the nature: *What would happen if...?*

Using Adventures or Simulations

The aim of using an **Adventure** or **Simulation** is to provide pupils with the understanding and experience of using and applying modelling skills, where they are encouraged to make decisions and predict outcomes. Pupils should become fully aware of the rules governing an adventure or simulation and realise the parameters of the program being used. They must also be aware of the differences between an adventure and a simulation. *The adventure or simulation being used should always support current themes or topics.*

The teacher needs to think very carefully about the reasons for using an adventure or simulation. The adventure or simulation should enhance topics or themes being pursued. The selection of an adventure or simulation must be appropriate to the age and ability of the pupil. Teachers should always assess an adventure or simulation program prior to using it with pupils.

Screens or images from the adventure or simulation can be extracted and saved for the teacher and pupils to use as resources. This will depend on the ages, abilities and previous experiences of the pupils. Many adventures and simulations allow positions to be saved. Pupils should be encouraged to use this facility.

Adventures and simulations can be introduced to pupils in a variety of ways. This demonstration can be to:

- the whole class, which would save on teaching time, or
- a group of pupils who could then become *pupil tutors*.

Pupils should fully understand what the adventure or simulation entails. They must be clear as to the objectives and overall aim of using an adventure or simulation.

Teachers should prepare differentiated, focused work sheets relating to the program. Recording sheets should also be prepared allowing pupils to note experiences. Pupils can use a Word Processor to write about their experiences and use the saved images from the adventure or simulation to enhance the work. Printed work can either be used for display or placed in a pupil workbook/file.

Tasks should be developed which are specific to the adventure or simulation being used. This will offer support to pupils in the early stages when using the adventure or simulation, and lead to increasingly challenging tasks for more able pupils as they develop familiarity with the program.

At all times, teachers must be vigilant and consider all safety aspects when pupils are working at the computer. It is important to ensure that:

- there are no trailing cables, either on the work surface or on the floor beneath the computer trolley, and
- pupils are comfortably seated at the computer, i.e. the chairs are neither too low nor too high.

Assessment of pupils' work should be in line with the school policy. When assessing collaborative work it is accepted that assessment can be carried out through:

- questioning the pupils;
- a print out of pupil work,
- saving pupils' files to disc;
- discussing outcomes with pupils; this should identify individual children's contributions to the activity.

Prior to commencing the task, consider the following:

Where in the overall plan for the school year would the use of Word Processing/DTP be most appropriate?

Which subject areas will be supported?

What are the desired teaching and learning outcomes? (Key Skills).

Is using the computer going to promote ease of use and enhance the subject?

Are there alternative methods other than a computer, which could be employed?

Does using the computer complement the use of cross-curricular work currently being undertaken?

What resources/materials will be needed?

How will groups be organised to use the computer effectively?

Are tasks differentiated?

Are tasks challenging?

Does the task build on the previous knowledge of the pupils?

What questions will be asked of pupils during and after the tasks?

When will assessment take place? (During the task or through questioning after the task).

How will assessment be used to inform future planning?

Teaching Points:

Prepare any differentiated materials that you intend to use such as task cards, worksheets etc.

Ensure that pupils are familiar with the Word Processor.

Ensure that the pupils are fully aware and understand the purpose of the task.

Ensure that pupils check, amend and edit their work where necessary.

Emphasise the need to save, retrieve and edit work.

Allow opportunities for pupils to print their work.

Prepare questions that allow opportunities to extend/reinforce/focus the activity.

Display work amongst other cross-curricular related work on walls or in class books etc.

When the task has been completed, consider the following:

Would the activity have been more profitable to pupils had the task been carried out in a more traditional way?

Were the teaching and learning objectives met?

Did using the computer enhance the learning opportunities of the pupils?

How will your assessment be used to inform future planning?

Did the use of ICT support the subject area?

Were the tasks appropriate and sufficiently challenging?

Did the children enjoy the activities and stay *on task*?

Are pupils acquiring expected and necessary skills in both the subject supported and ICT?

Are pupils acquiring expected and necessary Key Skills?

Was there continuity and progression?

Were pupils able to save, retrieve and edit work?

Were the pupil groups suitable?

Did the questioning of pupils during the task inform you and focus the pupils?

Did you or the pupils gain anything by using the computer?

Has your use of the topic been influenced by ICT?

What, if anything, would you change before using a Word Processor again?

Glossary

A language has developed around computers and related technology. It is important for teachers to employ models of good practice in ICT by using the terms accurately and appropriately. The glossary below will help you understand and use some of the terminology.

application	sometimes called a program. The set of instructions written to allow the computer to perform various tasks
backup	to make a digital copy of information for safe storage
bit	the smallest amount of computer information
bit map	the data stored by the computer. Each bit or individual piece of data is used by the computer to construct an image
bookmark	storage of the address of WWW sites that you visit frequently
bold	(bold face) changing the characteristics of text to print darker than surrounding text as a means of emphasising the text
boot	to start the computer
browser	a piece of software which finds and displays web pages and other documents stored on the Internet
bug	an imperfection in a computer program
CD ROM (Compact Disk Read Only Memory)	a compact disk used to store large amounts of information for use with a computer
cell	a storage area for one piece of information; general term used in association with spreadsheets
cell reference or cell address	the location of a specific cell given as co-ordinates in a spreadsheet
chart	visual representation of numerical information such as a line or bar graph
clipboard	a temporary storage area in a computer which allows information to be copied from one place and pasted into another. Once the computer is turned off the information is lost
cursor/caret	your reference point on the screen so that you can see where you are working. Cursors can come in a variety of shapes and sizes depending upon what function is being performed
cyberspace	the imaginary space that you travel around when you use the Internet
data	information suitable for manipulation, interpreting or communicating through a computer
database	an application which allows you to store, organise and search for information. Information is usually stored in records which contain varying numbers of fields
desktop publishing	the creation of such things as newsletters, magazines, brochures, posters and concert tickets on a computer by manipulating text and graphics

digital camera	similar to a conventional camera, though the image is stored as digital information rather than on film and therefore the image can be manipulated using the computer and appropriate software.
domain	part of the name for a computer sitting on the Internet which specifies its location and the sort of organisation which owns it
download	the process of retrieving a file from a remote computer for storage on another. For example, data can be downloaded from the Internet onto the hard-drive; data can be downloaded from the hard-drive onto a floppy.
draw	manipulating individual graphics on a computer screen
draw packages	use vector graphics, which means that drawings are viewed as objects rather than individual dots
electronic mail or e-mail	messages sent to you via computer
encryption	using a complex code to keep information secret
ESC key	the escape key on the keyboard
facsimile machine or FAX	a device which converts text and graphics into a digital signal for transmission via a phone line to another machine
fax modem	a modem capable of performing the functions of a fax machine when connected directly to a computer
FAQ	Frequently Asked Questions – a web page which contains the answers to the questions most commonly asked by visitors to a website
field	a single piece of information which can be used in a database
file	a document stored electronically
filename	the name of a file
floppy disk	a removable and widely used storage medium
folder or directory	similar to an alphabetical index and is used for organising and retrieving files. The type of computer being used determines whether the word folder (PC) or directory (Acorn) is applicable
font	the complete set of characters (letters, numerals, symbols) associated with a particular typeface or computer display
format	to assign given characteristics to text, usually to enhance its appearance
Graphical User Interface (GUI)	using icons to present information on the screen to assist the user
graphics	pictures or images of any type
hard disk	a more permanent storage medium usually within the computer, though portable ones are available
hard copy	a print out on paper of your document
hardware	the physical components of a computer
home page	the first or main page at a web site, it usually serves as a contents or guide to the rest of the pages at the site
hypertext	words in text, usually underlined, which indicate a link to take

	you to related information. Commonly used on the world wide web
icons	a small picture which you can click on to make your computer do something or which shows you that your computer is doing something
Information Superhighway	an alternative name for the Internet
importing	bringing information from one system or software package into another system or software package
interface	the connection between a computer and an external device or the user
Internet	often referred to as 'The Net' - the general term used to describe the world wide network of computers
Insert	place information in between existing information
integrated software package	software capable of performing more than one function; usually contains a word processor, spreadsheet, database and graphics program
Keyboard	one of the interfaces that can be used with a computer, often complemented with the use of the mouse
load	to read information stored on a computer disk into the computer's memory`
logged on	when a successful connection has been achieved
login	entering your ID and password to connect to the Internet
logo	a computer programming language designed for students to use the computer as a problem solving tool particularly in numeracy
mailbox	like a post office box; electronic mail arrives and is stored in your mailbox
manipulate	working with information or data to present it in a meaningful way
memory chip	a component inside the computer which holds information which can be used while the computer is performing a set action; also known as SIMMS
menu bar	the list across the very top of the screen. Each word in the list is the name of a menu. Pointing and clicking at a name allows you to access various menu items
menu item	a function listed within a menu. Menus and menu items vary from one program to another
modem	a device which changes information into a form for transmission on telephone lines and reconverts it for use by the computer
monitor	the Visual Display Unit (VDU), commonly called the screen
mouse	a hand held device, the movement of which appears on the screen, allowing you to perform certain operations on the computer
multimedia	the use of a combination of media to display information;

	includes sound, video, text and graphics
Musical Instrument Digital Interface or Midi	a device to attach a musical instrument directly to the computer
netiquette	the etiquette used in association with the Internet
newsgroups	a bulletin board where common interests can be shared
Netscape	a popular software program that allows access to the World Wide Web. Netscape and other similar programs are known as browsers.
operating system	the programming which allows the computer to operate. DOS and Mac OS are two operating systems
orientation	the placement of text or graphics on a screen. Commonly referred to as portrait or tall (being information displayed across the narrow side of a page) or landscape or wide (being across the wider side of a page)
paint	the process of creating a visual piece of art on a computer screen
password	like your P.I.N. for your credit card, it is not for sharing! This protects your personal mail and stops others from reading your mail
personal ID	a unique codename used to distinguish you from other users
point and click	action required when using a mouse to select an item
port	a socket, usually at the rear of a computer, where devices such as a keyboard, printer or a modem can be attached to the computer
presentation	a visual display produced with the aid of a computer software package which combines text, graphics, sound and charts
Random Access Memory (RAM)	the working memory of the computer. More and more RAM is becoming necessary as applications require more to operate. RAM should not be confused with storage memory which is found on your hard disk.
record	a collection of related information or fields from a database
related technology	devices which use the same electronic processors as computers but the operation is concealed, e.g. video recorders, fax machines, burglar alarms
search	a function which the computer is very efficient at performing
search engine	software that conducts searches according to the keywords entered
sensor	a device used to measure temperature, light or movement etc. When connected to a computer the information gathered by the sensor can be used by a variety of software applications
slide	a screen created using text, graphics and sound used as part of a presentation
slide show	a collection of individual computer screens linked together to form a presentation of information

software	the program or instructions provided for the computer to allow it to perform various tasks
spreadsheet	an application which allows you to store information in an organised way. Spreadsheets handle numbers and they also allow you to perform calculations with the information that is stored. The information is usually stored in cells.
surfing the net	browsing the Internet
synthesiser	a device which creates and plays sounds using computer technology
technology	is concerned with the purposeful and creative use of resources to meet human needs
text wrap	the ability of many applications to recognise the end of a line of text, to automatically take the text to a new line
tools	usually a collection of icons representing the different operations which can be performed by the software
touch screen	an interface device which allows the user to input information by touching the computer screen to select information or function
touch sensitive pad, board or tablet	another interface device which when touched communicates with the computer, usually in place of a conventional keyboard
vector graphics	a means of storing graphics so that they can be resized
web site	any computer providing information to the Internet
Windows	a graphics based menu system used to simplify many functions of a DOS computer and associated software
word processor	software applications which allow the storage, manipulation and organisation of text in an electronic form
World Wide Web or WWW	a part of the Internet which allows information to be presented as text, graphics, animation, movies and sound
WWW address	the unique code required to access a specific website, usually written in the form: http://www.dse.edu.nsw.au