

Content-free software

This section describes the use of the following types of content-free software in the primary school curriculum:

- writing software
- art and design software
- image editing software
- multimedia authoring and presentation software
- concept mapping software
- database software and spreadsheet software
- programming software.

Writing software

Writing software comprises both word-processing software and desktop publishing software. Examples of writing software include:

Title	Publisher
All My Words Clicker Writer Clicker Grids for learning Clicker 4	Crick Software
Textease 2000	Softease
Inclusive Writer Word Bar	Inclusive Technology Ltd.
Writing with Symbols 2000	Widgit
StoryMaker	SPA software
Word Publisher	Microsoft (MS)

Word processing software

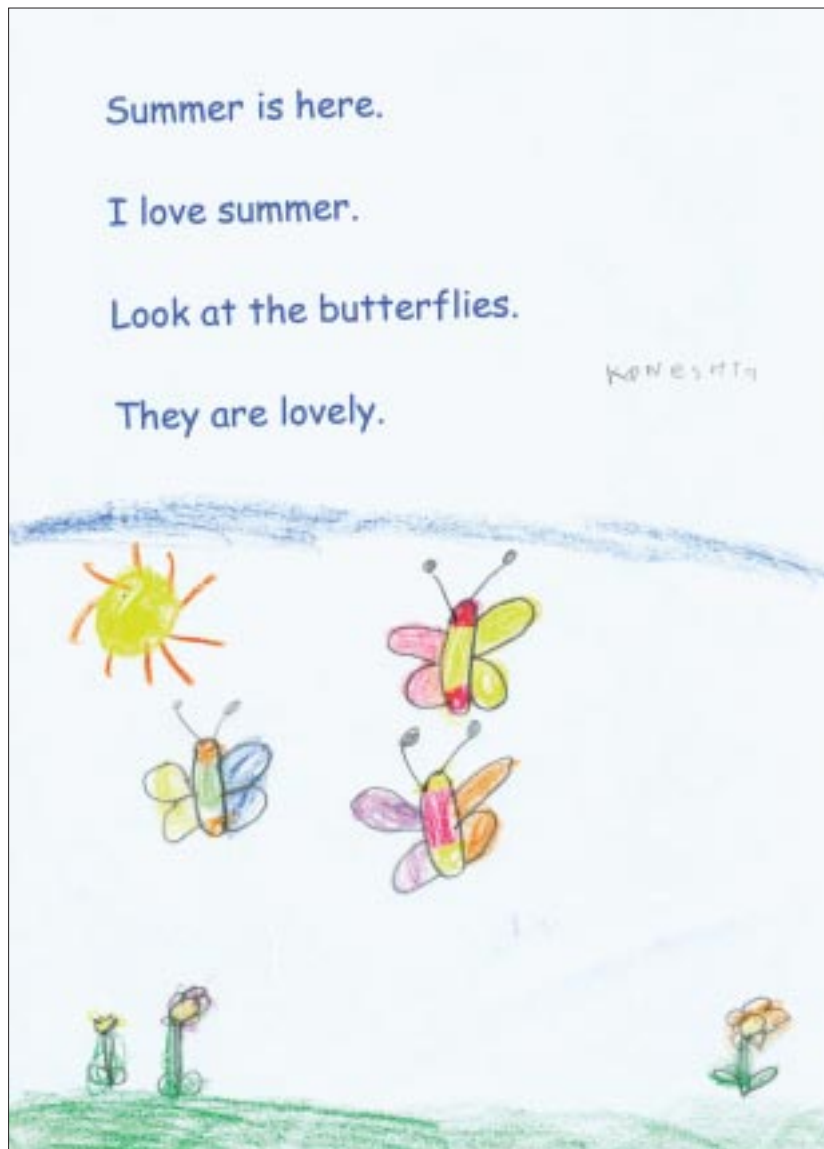
Word processing software enables children to manipulate electronic text in a number of ways including:

- changing the page format
- changing the font type
- changing, enlarging and reducing font size
- typing text
- moving text
- searching for and replacing words
- checking spelling
- inserting pictures or diagrams
- changing text colour.

Throughout the primary school, children can use word processing software to attain increasing levels of sophistication with writing. Children in infant classes can tell their stories to an adult who will type and print their work, allowing space for the children to illustrate their story.

An overlay (concept) keyboard enables young children and children with learning disabilities to manipulate electronic words, pictures and symbols. The concept keyboard can have a positive impact on the development of reading and writing skills of younger pupils, enabling them to improve their understanding of not only text decoding in reading, but also text construction in writing.

In the infant classes, the teacher frequently creates language experience charts, recording the children's oral expression, for collaborative reading. The teacher and children can also create language experience charts using a word processor such as Clicker, or presentation software such as PowerPoint. These materials can be a motivational springboard to the reading and writing process in the junior classes.

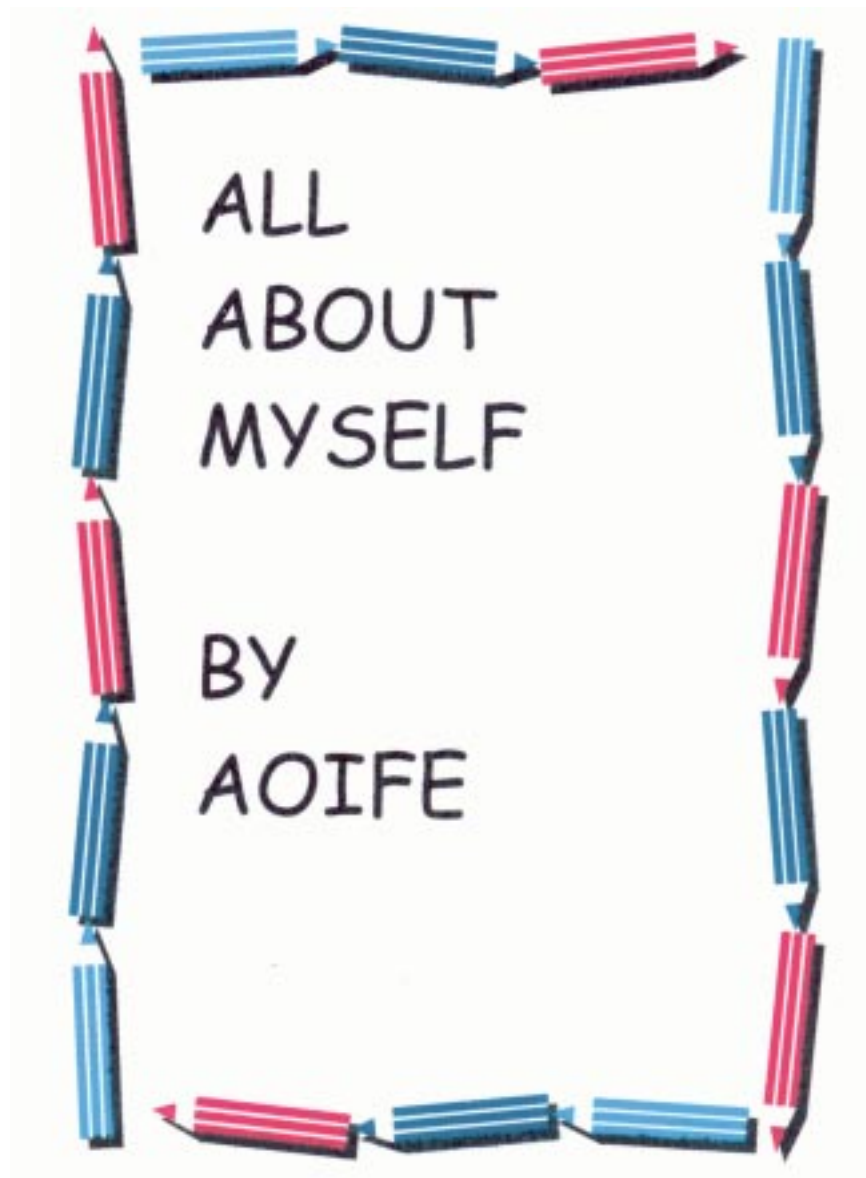


Junior Infants, Scoil Mhuire Gan Smál, Letterkenny

Certain word processing packages provide word banks that can be used to reinforce sight vocabulary. With increasing awareness of sight vocabulary, children can record their own reading using the speech-to-text function in the word processing software package. Creating and reading their own writing can be particularly motivational for reluctant readers and writers. As children gain in literacy and keyboard skills, they can use word processing software to facilitate the sequence of drafting, editing, and redrafting which is at the heart of the writing process in the primary school curriculum.

Further guidance on teaching the writing process is provided in the *Teacher Guidelines for English*, page 76.

The following exemplars describe a developmental progression in use of word processing software from simpler to more complex uses. The first exemplar describes the use of word processing software to develop children's confidence and competence in using language.



Exemplar One

Using word processing software to develop personal writing

Curriculum Area/s	Strand/s	Strand unit/s
Language: English	Competence and confidence in using language	Writing: developing competence, confidence and the ability to write independently
Approaches and methodologies	Talk and discussion. Drafting and redrafting in the writing process.	
Level	This exemplar can be adapted for use with any class level.	
Objectives	<p>The child should be enabled to</p> <ul style="list-style-type: none"> • learn to revise and redraft writing • develop his/her ability to write using information technology • decide the quality of presentation in relation to the purpose and audience of a piece of writing • draft, edit and redraft personal writing about his/her family using word processing software, or pencil and paper • enhance the presentation of his/her writing using appropriate graphics and images. 	
ICT resources	Word processing software (e.g., Microsoft Word, Textease)	
Other resources	Pencils and paper (e.g. writing journals)	
Preparatory activities	Children will have experience of drafting and redrafting their writing in paper-based format.	

Methodology

1. The teacher begins by involving children in a class discussion on 'Myself and my Family.' The children discuss ways to structure their ideas. Useful ideas on brainstorming, webbing and storyboarding are provided in the Teacher Guidelines for English, page 79.
2. Children begin the first draft, either by handwriting using pencil and paper, or by typing using word processing software. The teacher supports children by initiating ongoing discussion or conferences at regular intervals during the writing process, and at the conclusion of the work.
3. The children edit their writing, checking for spelling, grammar, punctuation, vocabulary, idiom and so forth, using the paper-based dictionary and thesaurus, or those embedded in the word processing software. (Websites also provide support for writing, e.g., www.dictionary.com.)
4. Children redraft their work formatting the type, style and size of their font, selecting the appropriate page setting (landscape or portrait) and inserting clip art and images to enhance their writing product.

Extension activities

Children could

- add features to the presentation of their work using Art and design software, e.g., page borders and personal drawings
- add images of family members to their writing using a digital camera, or a scanner to copy family photos in an electronic format
- reorder the sequence of sentences in their story (using the cut and paste commands) and give the jumbled story to a group of peers to re-arrange
- print their writing samples and bind them as a class book
- record sound, so that their writing can serve as a talking book
- write additional articles about themselves, which would form part of their personal biography.



Autobiographies

Fourth class, Dromore N.S. Killygordon, Co. Donegal

The next exemplar describes the use of word processing software to develop the emotional and imaginative life of fifth and sixth class children using authentic writing projects.

Exemplar Two

Letter writing as part of a project on the Great Famine using word processing software

Curriculum Area/s	Strand/s	Strand unit/s
Language: English	Emotional and imaginative development through language	Oral, Writing: developing emotional and imaginative life through writing and oral language
SESE: History	Eras of change and conflict	The Great Famine
Approaches and methodologies	<ul style="list-style-type: none"> • experiencing and responding to a wide range of text • fostering the process of writing • writing for different audiences and purposes • developing reference handling and research skills • talk and discussion. 	
Level	Fifth and sixth classes	
Objectives	<p>The child should be enabled to</p> <ul style="list-style-type: none"> • study a period or periods in the history of the local village, town, city area, townland, parish or county <i>the Famine</i> • use imagination and evidence to reconstruct elements of the past • imagine and discuss the feelings and motives of people in the past • communicate this understanding of the past in a variety of ways <i>writing letters and stories based in famine times</i> • write stories and poems (a letter) • express individual responses to literature • express in writing reactions to the experiences of others. 	
ICT resources	<p>Word processing software (e.g., Microsoft Word)</p> <p>Reference software (e.g., Microsoft Encarta), the Internet, scanner, scanning software and digital camera</p>	

Other resources

Reference material, Pencils and paper, crayons
(writing journals)

Preparatory activities

Study of the famine or appropriate era in history, practice in drafting and redrafting writing, writing for different audiences.

Methodology

1. During their study of the famine, children adopt a (real or imaginary) character who lived through famine times. Children develop their famine character by researching the famine experience (using reference software) and writing notes on the experiences of this imaginary or real person in nineteenth century Ireland.
2. At the conclusion of their study of the famine, children bring their character to life by drafting a letter that gives voice to that person's famine experience. Ideas may include writing a letter
 - to Daniel O'Connell, asking for help
 - to a landlord, seeking help for passage to America
 - to cousins in America, describing the ravages of the famine
 - to family in Ireland describing your new home in America.
2. Using word processing software, children edit and redraft the content of their letters. They format their text and add images to embellish their letter writing.
3. Children print their letters and share them with their peers.

Extension activities**Integration with Irish**

D'fhéadfadh na daltaí litreacha Gaeilge a chur go dtí a chéile. Is féidir clóanna gaelacha deasa a íoschoipeáil ó www.fainne.org.

Children could

- increase the authenticity of the 'look' of their letters (for class display) by using appropriate fonts, asking an adult to burn the edges of the letter, and so forth
- share their letters with their friends during a small group 'letter reading' circle
- print their writing samples and bind them as a class book
- write authentic letters as a part of their project research, for example, to the local library.

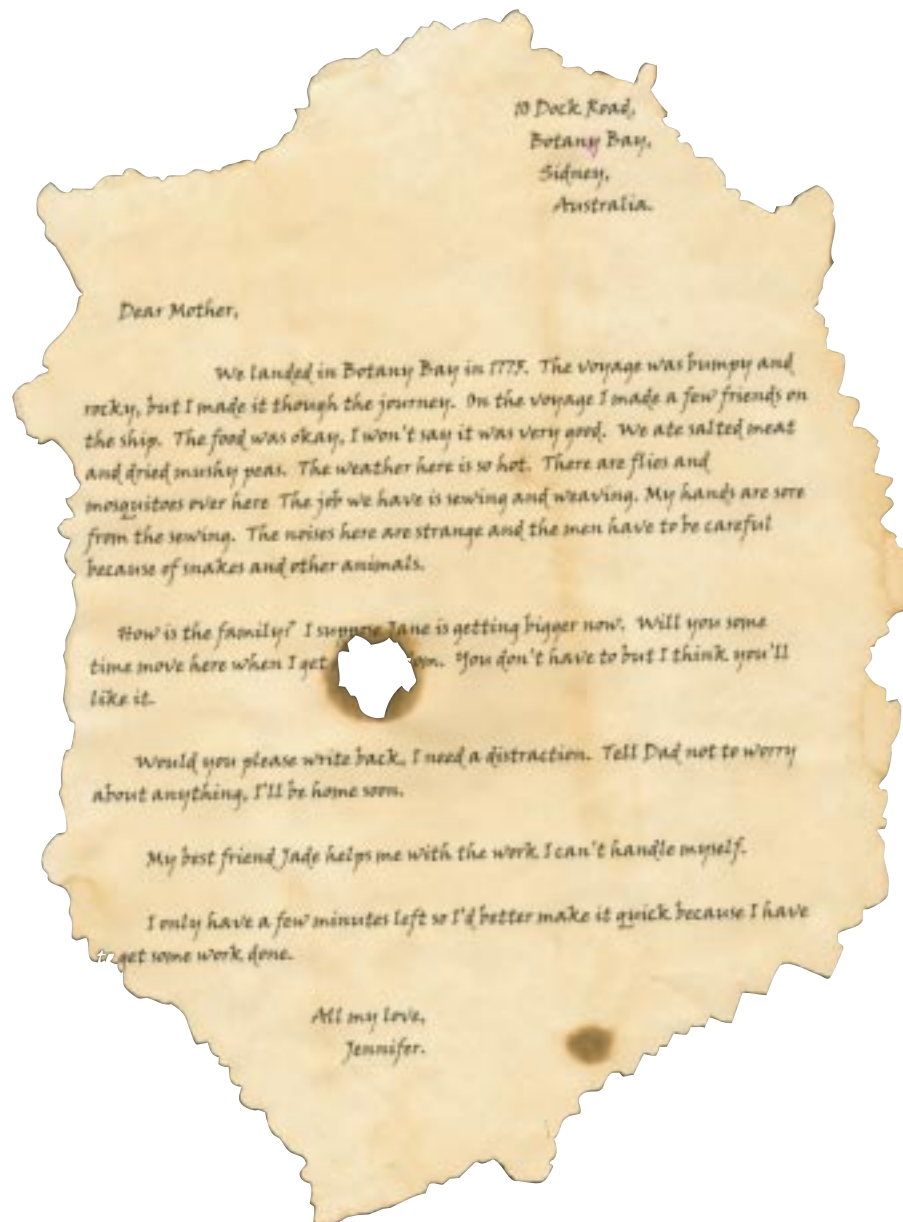
Árasán 2
35 Sráid Hoboken
Nua Eabhrac
Meiriceá

2 Bealtaine 1855

A Sheáin a stór

Conas atá tú a chroí? Tá súil agam go bhfuil tú go maith. Tá mé ag scríobh ó Nua Eabhrac. Tá an áit seo chomh mór. Cuireann sé eagla orm. Conas tá mo mháthair? An bhfuil na prátaí fós lofa...

Síle



Letter Home

Sixth class, Holy Rosary School, Dominican Convent, Wicklow

Desktop publishing software

Desktop publishing software extends the publishing capabilities of word processing software. This software provides children with templates, graphics and other resources to present their writing in attractive and sophisticated formats e.g., for posters, signs, labels, captions, and class or school magazines.

The following exemplar describes the use of desktop publishing software to create a class magazine.

Exemplar Three

Creating a classroom magazine using desktop publishing software

Curriculum Area/s	Strand/s	Strand unit/s
Language: English/Gaeilge	Competence and confidence in using language	Writing: developing competence, confidence and the ability to write independently
Level	<p>Fifth and sixth classes.</p> <p>This may be adapted for use with other classes with a greater level of teacher support.</p> <p>A whole school magazine may be created with input from all classes.</p>	
Objectives	<p>The child should be enabled to</p> <ul style="list-style-type: none"> • write independently through a process of drafting, revising, editing and publishing • take part in co-operative writing activities • choose a form and quality of presentation appropriate to the audience <p><i>create a class or school magazine</i></p> <ul style="list-style-type: none"> • choose a register of language appropriate to the audience. 	
Approaches and methodologies	<p>Talk and discussion, drafting and redrafting, personal writing, collaborative work, group work, brainstorming.</p>	

ICT resources

- word processing software (e.g., Microsoft Word, Textease 2000)
- desktop publishing software (e.g., Microsoft Publisher)
- reference software (e.g., Microsoft Encarta) Internet access, digital camera, scanner, scanning software

Other resources

Pencils and paper (e.g. writing journals)
Prepared materials

Preparatory activities

- Children prepare items for inclusion in the magazine.
- Examination of other magazine formats and layout.
- Drafting and redrafting of written accounts.
- Experience with common word processing tasks, for example, creating, saving pages, etc.

Methodology

1. Through class discussion, children generate ideas regarding the content and presentation format for a classroom magazine. News items to be featured might include a description of a class history project, poems authored by children, features on class excursions, class news, jokes, quizzes, and so on.
2. The teacher demonstrates the use of the desktop publishing package, e.g., Microsoft Publisher for children in the design teams.
3. The teacher and children outline the overall scope of work involved in producing a class magazine, and elect each child to a team of three to five children, with responsibility for either producing content for the magazine, or designing the magazine layout.
4. The children gather information using a range of tools and resources including reference software to record facts, class interviews to document children's experiences, and so forth.
5. The design team uses the desktop publishing package to layout and edit the text and images. The layout is presented to the class, and following their feedback, is revised and improved.
6. The contributions of each group are presented in one magazine publication.

Extension activities

Children could

- gain expertise in all phases of producing a class magazine by rotating groups and responsibilities for the production of each new publication
- create regular news updates on school activities, for example, sports, art activities, drama, music, etc.



The image shows a sample of a school magazine titled 'Knockconan Kids News'. At the top, there are five handprints in yellow, red, blue, yellow, and red. Below them is the title 'Knockconan Kids News' in a large, blue, sans-serif font. Underneath the title is the subtitle 'Our School Magazine' in a smaller, blue, sans-serif font. The main body of the magazine contains two articles. The first article, 'This is the first edition of KKN (Knockconan Kids News)', describes the school's activities and mentions a teacher who has moved to a new school. The second article, 'School Tour', describes a tour of the Cavan Crystal Maze and mentions various activities like orienteering, folklore, and a canteen. On the right side of the magazine, there are two sections: 'Knockconan N.S.' which lists 'Volume 1, Issue 1' and 'June 2001', and 'Special points of interest:' which lists four items: 'Immigrants visit our school', 'Foot and Mouth Crisis in our country', 'Write a book winners in our school', and 'Visit to the ICT Fair in Dundalk'. Below these sections is a table of contents titled 'Inside this issue:' which lists the following items and their page numbers: 'School Tour' (1), 'Afterschools Win' (2), 'Foot and Mouth' (2), 'Annual Schools ICT Fair' (3), 'Credit Union Winners' (4), 'Flat Stanley Project' (5), and 'Write a Book' (6).

Knockconan Kids News

Our School Magazine

This is the first edition of KKN (Knockconan Kids News). We started to inform you of the events that took place throughout the year. We will continue KKN throughout the following year. We have gathered up some information on what we have done in the past year. The magazine covers the 8 classes, Junior infants, Senior infants, 1st class, 2nd class, 3rd class, 4th class, 5th class and 6th class. *Mrs. Mary* taught in this school for 9 years and has moved to Urbleshaney National School. *Mrs. Mary* now teaches in the Infant room. She also takes 4th, 5th and 6th classes for football training. *Mrs. Mary* has been teaching 5th and 6th classes for the past few months. *Mrs. Mary* has been on sick leave since Easter. There was a Multi-sensory pilot group and many other pupils in our school took part in the Multi-Sensory programme. Everyone in 5th and 6th classes has contributed to this magazine. We hope you enjoy reading KKN.

School Tour

This year 2nd, 3rd, 4th, 5th and 6th are going to Cavan Crystal Maze. We will be going on the 18th of June. Some of the activities we will be doing are orienteering, Folklore, etc. There will be Guides and a Canteen. It cost £17 per child. Cavan Crystal Maze is a series of over 30 mental, physical and skill challenges. We must locate and solve each challenge within a time limit with a Crystal Trophy for the best team at the end of the day. We will be doing an assault course, golf, football, darts, pole run, square Basher, etc. We will also walk up a Giants Grave on Loughleigh mountain, 1119 feet above sea level where you can see 16 counties. We hope that we enjoy ourselves this year.

Knockconan N.S.

Volume 1, Issue 1
June 2001

Special points of interest:

- Immigrants visit our school
- Foot and Mouth Crisis in our country
- Write a book winners in our school
- Visit to the ICT Fair in Dundalk

Inside this issue:

School Tour	1
Afterschools Win	2
Foot and Mouth	2
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Credit Union Winners	4
Flat Stanley Project	5
Write a Book	6

Class Newsletter

Fifth and sixth classes, Knockconan N.S., Emyvale, Co. Monaghan

Writing software: benefits for children

The use of word processing software in the Primary School Curriculum can benefit children by

- helping children to outline and sequence their thoughts
- promoting the use of correct spelling and appropriate grammar
- facilitating edits to, and redrafts of, the child's writing
- motivating the learner to write, as the improved legibility of the writing supports the peer review process and collaborative discussion of the writing
- creating personalised writing records and journals
- enabling high quality presentation of ideas
- supporting children with specific learning difficulties through the use of specialised software, e.g., word prediction, word banks, talking word processors, and word grids in Clicker.

Writing software: teacher uses

Word processing software provides support for teachers in planning lessons, developing activities, and maintaining records.

Teachers can use word processing software to

- complete records of their schemes of work
- create worksheets for all curricular areas
- create supportive material for reading or language-based activities, for example, templates, worksheets or writing frames, with pictures relating to specific topics (for paper or computer based work)
- create word banks to support pupils' writing
- produce flash cards to support vocabulary development for children with Special Educational Needs or younger pupils
- create tests, questionnaires or question and answer sheets for children in different curricular areas
- create signs, notices, labels and captions
- produce a school magazine for parents
- maintain records of children's learning
- create check-lists to demonstrate mastery learning
- document classroom observations
- write letters to parents.

Art and design and image editing software

Art and design and image editing software is now provided as standard software with new computer systems. This type of content-free software contains a range of drawing and paint tools including paintbrushes, spray cans, erasers, and drawing templates (to create shapes) for creating and editing images. These features of art and design software enable children to create effects, and manipulate and modify designs, pictures and patterns. More sophisticated image editing software is supplied with digital cameras and scanners, and can be used to edit photographs and graphics to enhance the presentation of projects, class magazines, etc. In this way, art and design software provides children with enhanced opportunities to explore their creative capacities in a different medium that supports their use of traditional art materials.

Examples of art and design software include

Title	Publisher
Paint	computer package
PaintShop Pro	JASC Software
Kidpix	The Learning Company
Dazzle	SEMERC, Granada Learning



The exemplars in this section show a progression from simpler uses of basic art packages to the more complex use of image editing tools. The following exemplar shows an approach suitable for junior classes, where the children used a paint program to follow on from and enhance their understanding of colours in the environment and of changes in living things.

Exemplar Four

Using a paint program to focus children's observation skills

Curriculum Area/s	Strand/s	Strand unit/s
Visual Arts	Paint and colour	Painting
SESE: Science	Living things	Plants and animals
Approaches and methodologies	Observing and recording, questioning, exploring and investigating, experimenting with matching colours.	
Level	First and second. It may be adapted for use by other classes.	
Objectives	<p>The child should be enabled to</p> <ul style="list-style-type: none"> • explore colour using a variety of materials and media <i>match colours and create representations of living objects, using the paint programme on the computer</i> • paint objects chosen for their colour possibilities • recognise and describe the parts of some living things <i>examine the parts of flowers: stem, petal, leaf</i> • understand that seasonal changes occur in living things. <i>grow flower bulbs in the classroom and observe them grow and change</i> 	
ICT resources	<ul style="list-style-type: none"> • computer paint package, e.g. Dazzle • digital camera • printer • scanner, scanning software 	
Other resources	Pencils and paper, crayons, flowers grown in the classroom or images of flowers.	
Preparatory activities	<p>Integration with SESE : Science; growing flower bulbs in the classroom; looking at flowers and plants grow; looking at parts of the flower.</p> <p>Talk and discussion on colours, colour in the world around us.</p>	

Methodology

1. The class plant flower bulbs – daffodils and tulips in the autumn. During the winter, the children look after the bulbs, watering them and observing them grow. The children will observe the flowers blooming in the spring time, but notice how quickly they fade away.
2. The teacher initiates a discussion on ways of saving the lovely flowers. Discussion centres around taking photos, painting them, etc.
3. The children paint pictures of the flowers in bloom, showing their favourite flower colours.
4. The teacher scans some of the images. Pictures may be printed out (or displayed onscreen using the digital projector).
5. Discussion continues on comparing the colours of the real flowers with the images. Ask the children whether they can create on the computer the same colours as the real flowers.
6. The children compare and discuss the colours of the flowers and what they will create, for example: green leaves, red or yellow petals.
7. The teacher demonstrates the computer paint package to the class or to groups of children showing how to select the pen, paint brush and spray tools using the mouse.
8. Supported by the teacher, the children try to recreate a flower on screen trying to match the colours.
9. The teacher can display scanned images of the flowers nearby, so that the children can identify and match the colours of stem, leaves and petals using the palette.

Extension activities

Children could

- scan real flowers and observe similarities and differences between the real flower and the scanned image.
- identify different parts of the flower, petals, leaf, stem
- record the growth of other plants and trees using the digital camera to keep a seasonal record
- adapt their scanned painted images of different elements of the environment to record the seasonal changes at appropriate times throughout the year
- scan other examples of finished paintings, and use the computer paint tools to edit and embellish it, for example, add borders or use the spray can.

Image editing software

The following exemplar describes children's use of photo-editing software to modify digital images.

Exemplar Five**Editing digital images using art and design software to create interesting landscapes**

Curriculum Area/s	Strand/s	Strand unit/s
Visual Arts	Paint and Colour	Painting
Approaches and methodologies	Observing and recording, exploring and investigating.	
Level	Fifth and sixth classes. It may be adapted with teacher support for use by younger children.	
Objectives	<p>The child will be enabled to</p> <ul style="list-style-type: none"> demonstrate the effect of drawing and painting tools, on specific elements of a digital image, using art and design software. 	
ICT resources	<ul style="list-style-type: none"> image editing software (e.g., Microsoft Composer, or Adobe Photoshop) digital camera scanner, scanning software 	
Other resources	Pencils and paper, a variety of images	
Preparatory activities	<ul style="list-style-type: none"> Children will need to be familiar with using the digital camera. Previous media work on looking at other images and how they have been enhanced is necessary to refine the children's observation skills. The teacher will need to be familiar with the use of image editing software and preparatory mini lessons will be necessary. The teacher demonstrates the features of the image editing software. 	

Methodology

1. Children create digital images of landscapes, using a digital camera or scanner, and save these images to their computer. Alternatively children can download digital images from free photo galleries available on the Internet (www.picturequest.com).
2. Children examine the artistic elements of their image and select the qualities of the image to be modified (e.g., colour, contour, texture).
3. Children use image-editing software to modify their images, producing a number of iterations or modifications to the same image. They can add other features to the landscape, and modify the sky, vegetation and so on. They can incorporate the images into a photographic collage.
4. Talk and discussion will ensue as the children compare how individual children modify the same original photograph in different ways. The resulting images may also be used as the basis for personal writing.

Extension activities

Children could

- create a photographic collage containing all variations or modifications to their original image
- create a new image by combining elements of other images
- use the edited images as a basis for imaginative and creative writing
- extend their artwork by studying the elements of Pop Art, which brought such wide acclaim to Andy Warhol's edited image of Marilyn Monroe
- use problem-based learning approaches to develop their media skills, for example, on the Exploring the Environment site of NASA's Classroom of the Future, the children can use digital editing skills as part of a larger mission.

<http://www.cotf.edu/ete/modules/activities/mars/situation.html>

<http://www.cotf.edu/>

The next exemplar describes children's use of art and image editing software to explore elements of textile design.

Exemplar Six

Creating textile designs using art and design software

Curriculum Area/s	Strand/s	Strand unit/s
Visual Arts	Print	Making Prints
Approaches and methodologies	Observation of colour, shape, design, pattern, exploring patterns in the environment, on furniture, fabric, etc. Talk and discussion.	
Level	Fifth and sixth classes. This exemplar can be adapted for use with other classes.	
Objectives	<p>The child will be enabled to</p> <ul style="list-style-type: none"> • use a computer art program to create original images that are not dependent on clip art <i>create a textile design for clothing or furniture using art and design software</i> • demonstrate an awareness of the benefits and drawbacks of using ICT to produce patterns, in a small group discussion 	
ICT resources	<ul style="list-style-type: none"> • computer/s • art and design software (e.g., Adobe Photoshop) • digital projector 	
Other resources	Markers, paints and crayons and paper	
Preparatory activities	Children will need to be familiar with basic computer applications, and have a familiarity with word processing, and paint and draw icons. Additionally, preparatory exploratory work on using the software would be necessary prior to tackling this project.	

Methodology

1. Using a digital projector, the teacher demonstrates to the children the use of art and design software to draw and paint. The teacher provides children with a help sheet, which illustrates the layout and functions of the software.

Number	Tool	Tool uses
1	Shape selector	To select areas of a pre-chosen shape
2	Freehand selector	To draw around an irregular area
3	Magic wand	To select special areas of a picture
4	Eye dropper	to select colours to paint with

2. Children use the paint and drawing tools including the symmetry, re-sizing and rotating tools, to create an original image or motif.
3. Children experiment with the effect of duplicating different parts of the motif. Children select the motif image to be duplicated, and they copy and paste the image many times to create a tile effect.
4. Discussion focuses on features of the software used to produce children's patterns, and the benefits and drawbacks of using art software for this activity.

Extension activities

Children could

- compare the effect of using the same motif to create patterns with paper and paint methods, with creations using art and design software
- create a selection of fabric prints as part of an electronic portfolio
- investigate the mathematical foundation for repeating and rotating images to create pattern
- extend their artwork by studying the elements of pattern in artwork by M.C. Escher.

Art and design, and image editing software: benefits for children

Art and design software can benefit the child's learning by enabling the child to:

- create and adapt images by manipulating the drawing and painting tools
- create designs for posters and background displays for projects, and other class work
- explore, invent and construct pattern, line, form and shape using art and design software
- produce, refine and control versions of their work by organising images and space on the page
- develop an understanding of pattern as they learn to control and manipulate the placement and use of, repeated designs
- adapt their own creations and designs when they produce a range of examples based on one design, and to merge designs
- plan, invent and make designs and shapes using two dimensional media
- manipulate shapes that they have created in another medium, e.g. a pattern created on paper and scanned into the computer can be used to create new, innovative patterns
- adapt and work with maps, and so, create their own maps
- collaborate with others in creating images, make decisions about what to do next; react to what they've designed, and share their creations with others
- create collaborative projects when they merge designs created by group members
- develop media literacy skills and the critical understanding that images used in various media may be edited, rather than true representations of reality
- record and save examples of their art and design activities
- store different phases of design for incorporation into their portfolio or project
- display their designs for others either in screensaver programmes, or on print outs.

Art and design software: teacher uses

Teachers can use art and design software to

- produce pictures, posters, signs, displays and charts to support all curricular areas
- produce templates for work in a range of curriculum areas.
- produce templates for children's books and language experience material
- produce classroom materials and activities for exploration of line, shape, angles , etc.
- collate and collect samples of children's work in portfolios.

Multimedia presentation and authoring software

Also referred to as multimedia authoring software, multimedia presentation software allows children to display text, images, animation, video and sound together in the form of a digital slideshow, or multimedia presentation. In an increasingly visually oriented world, children's ability to use multimedia software may help them to make sense of the media that is part of their daily lives.

Text, images, sound, and video may be acquired from many sources, including

- the Internet
- books
- pre-existing photographs and drawings
- original paintings and drawings created by the children.

The facility to scan photographs or pictures using the scanner, to include digital pictures, and the use of a colour printer has meant that multimedia authoring and presentation software can be used to add creativity right across the curriculum. Such image editing software is supplied with digital cameras and scanners, and digital video editing software is supplied with digital video cameras, thereby enabling the user to download images and or video clips for future editing and use. The addition of sound to their projects can also support children's oral presentation skills.

Multimedia authoring projects created using these tools can be presented in a number of formats including:

- print out
- cut onto a CD
- displayed on the computer
- projected on a large screen through a data projector.

Multimedia presentations incorporating text, sound, images and video are enhanced by the use of peripheral ICT equipment, including the following:

- digital camera
- digital voice recorder
- digital video camera
- data projector.

A data projector is an ideal way of ensuring that children and teachers can use the presentation software in a whole-class situation. For example, the teacher could use a slide show to teach new vocabulary as part of the *réamhchumarsáid* as *Gaeilge*. Children's voices can also be recorded on these slides.

Producing a digital video can engage the children in the learning process, helping to develop their visual discrimination skills, and promoting analysis and critical evaluation skills. Making a digital video can engage children actively in their own learning, and can add value to the learning process when used for specific projects rather than for its own sake. Although the creation of animated films may currently appear an advanced use of the medium, developments in software will make the inclusion of moving images a standard feature of presentation work in the future.

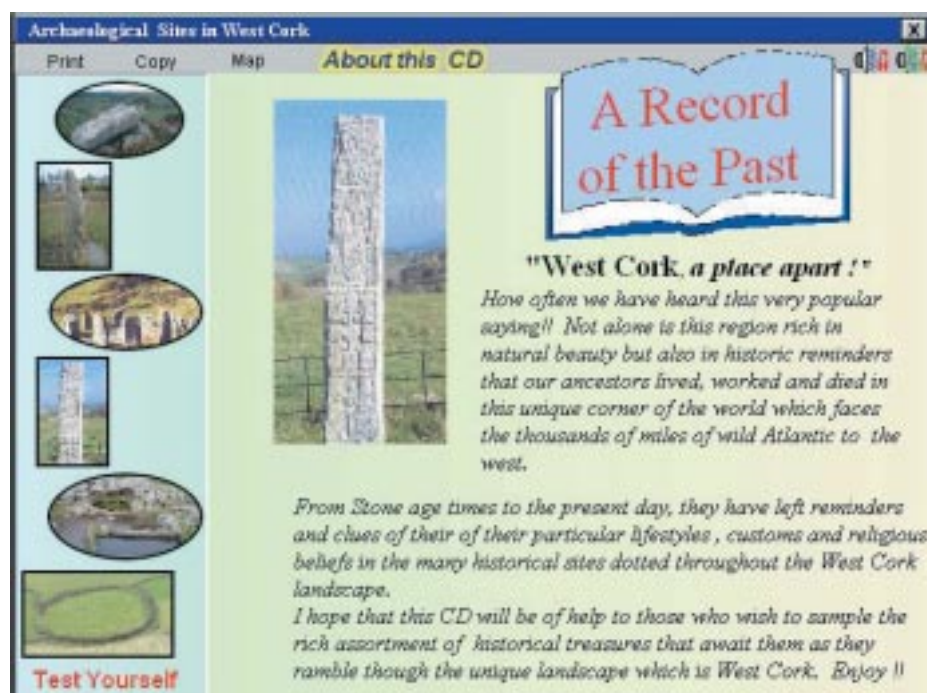
A pilot project using film in the primary school – Fís- successfully showed how teachers and children learned together to create film.

<http://www.dliadt.ie/fis/index.html>

The exemplars in this section show a variety of approaches to both long and short term projects, using a broad range of multimedia authoring tools, incorporating text, audio, and images, and presented in different formats, ranging from book, CD-ROM, website to animation.

Some examples of Multimedia Authoring Packages include:

Title	Publisher
Clicker 4	Crick Software
Hyperstudio	Tag Learning
PowerPoint	Microsoft
Illuminatus Opus Pro	Digital Workshop
Kar2ouche	Immersive Education



The following exemplar describes the process of creating animations using multimedia presentation software and a digital camera.

Exemplar Seven

Creating animated objects using multimedia presentation software

Curriculum Area/s	Strand/s	Strand unit/s
Language: English/Gaeilge	Emotional and imaginative development through language	Reading: responding to text
Visual Arts	Clay	Developing form in clay
Approaches and methodologies	Observing and recording. Designing and making using a range of materials. Exploring and investigating shapes and media.	
Level	First and second class, suitable for all classes depending on the activity.	
Objectives	The child should be enabled to <ul style="list-style-type: none"> explore and discover the possibilities of clay as a medium for imaginative expression <i>depict a sequence of events in a story using clay or other modelling material to make imaginative hand-sized props</i> respond to characters and events in a story. <i>animate the story using digital images of their hand-sized props and multimedia presentation software</i> 	
ICT resources	<ul style="list-style-type: none"> computer, multimedia presentation software (MicroWorlds) digital camera printer 	
Other resources	<ul style="list-style-type: none"> pencils and paper clay or mála 	
Preparatory activities	Talk and discussion on the story to be animated, comparing story lines, preparatory work on using the digital camera.	

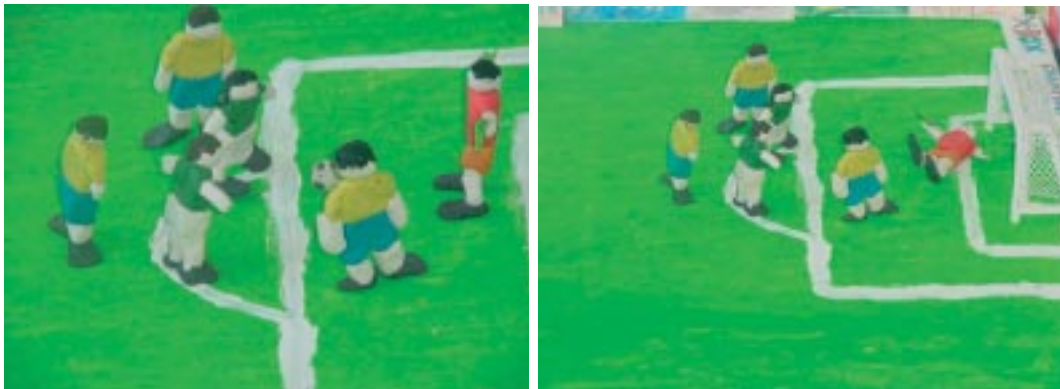
Methodology

1. The children use clay to make models depicted in a story they are familiar with.
2. Using a digital camera, children take several photographs of their clay models. For each photo, children make some changes to their clay model scene.
3. With help from the teacher and other adults, or older children, the children save each of their photographs or digital images on to a series of slides using a multimedia authoring package. Children set the slides to appear in succession in intervals of a second.
4. The slide show is then viewed as a short animation or cartoon. Music can also be added to the presentation for effect. The music may be a recording of a performance by the children. Alternatively, free shared music can be downloaded from the Internet.

Extension activities

Children could

- take regular photos of flowers or plants growing over time, to animate the growth process in a series of slides. This develops the children's understanding of changes over time.



Holy Spirit Boys N.S., Ballymun, Dublin 11

The next exemplar describes a project involving children's use of multimedia presentation software to document the impact of the Great Famine on people in their town. In this example, a wide range of objectives are covered across curriculum areas.

Exemplar Eight

The Great Famine in a West of Ireland town using multimedia presentation software

Curriculum Area/s	Strand/s	Strand unit/s
Language: English	Emotional and imaginative development through language	Reading: responding to text
SESE: History	<ul style="list-style-type: none"> • Eras of change and conflict • Politics, conflict and society • Local studies • Story • Life, society, work and culture in the past 	<ul style="list-style-type: none"> • The Great Famine • O' Connell and Catholic Emancipation • Buildings, sites or ruins in my locality • Stories from the lives of people in the past • Life in the nineteenth century
Approaches and methodologies	Using multimedia presentation software to facilitate the growth and development of the skills of a historian, including knowledge of <ul style="list-style-type: none"> • time and chronology • change and continuity • cause and effect • using evidence • synthesis and communication • empathy. 	
Level	Fifth and sixth classes. This exemplar can be adapted for use with other classes.	

Objectives

The child should be enabled to

- study a period or periods in the history of the local village, town, city area, townland, parish or county
the Famine
- engage in study of aspects of the periods in which political changes or movements have had an important influence on the lives of people in Ireland
O' Connell and Catholic Emancipation
- become familiar with important events in the history of the locality
- actively explore some features of the local environment
the workhouse and the parish church
- use library facilities outside of school
- use evidence that is more complex
research the famine using text resources (history books, reference books, reference software, the Internet) and interviews with people in the locality
- examine and make deductions from simple relevant evidence which informs us about the lives of people in the period
- choose a form and quality of presentation appropriate to the audience
- present ideas that are relevant to the subject in a logical sequence
organize and present his or her research on the Great Famine using multimedia presentation software
- use imagination and evidence to reconstruct elements of the past
- imagine and discuss the feelings and motives of people in the past
- communicate this understanding of the past in a variety of ways
- engage with the writing of one piece over an extended period
- write independently through a process of drafting, revising, editing and publishing
- take part in co-operative writing activities.

ICT resources

- multimedia presentation software (Hyper Studio)
- reference software
- internet access
- digital camera
- digital projector or large screen television
- printer

Other resources

- Reference books and history books
- Pencils and paper

Preparatory work

Class preparatory work includes study of history of the time period, local history studies, contacts with local historians, local library, National Archives, etc.

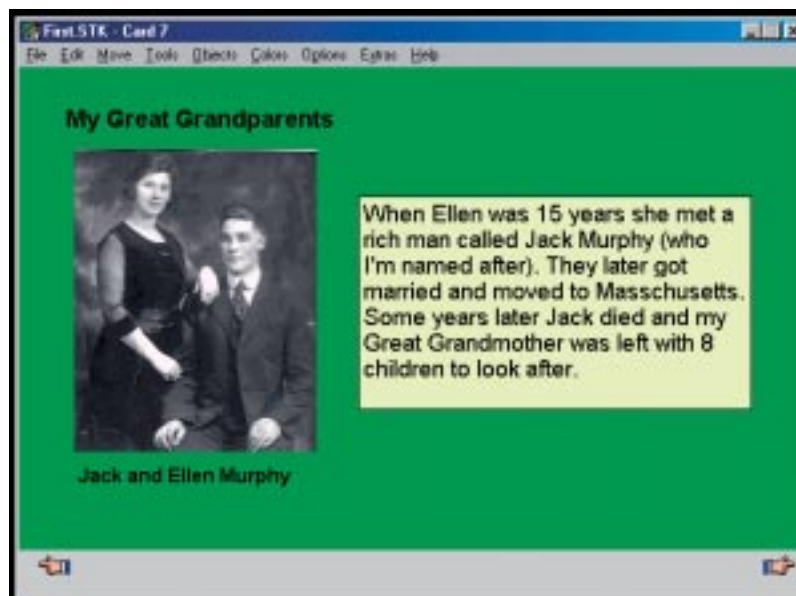
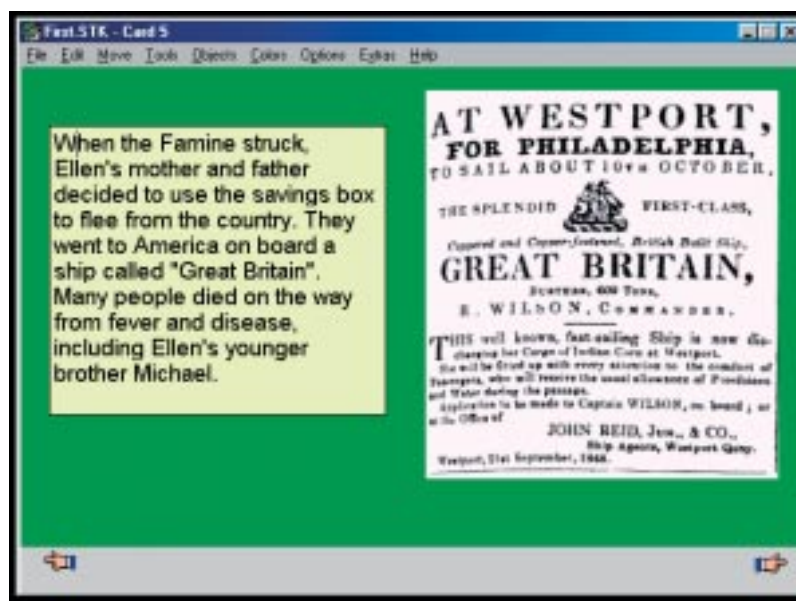
Methodology

1. The teacher introduces the story of Jack, a returned emigrant who wants to find out what life was like for his ancestors during the famine. Each child will research the history of the famine in the locality, and create a multimedia presentation for Jack.
2. The children identify the sites in the town, which are worthy of investigation in relation to the famine, e.g., the workhouse and the parish church.
3. Having identified the sites to be researched, and their history, the class is divided into groups. Each group focuses on a particular area of investigation, e.g., the workhouse, the pauper's grave, the soup kitchen, and the journey to America.
4. Using ICT resources (the Internet, and reference software), library resources, and interviews with local historians, the children begin their research.
5. Each group of children meets to discuss their findings and plan the content of their presentation. Children use the multimedia authoring software to present their research using
 - text
 - graphics from the Internet
 - photographs from digital camera
 - music from CDs
 - movie/video clips from a video camera
 - speech recordings using a microphone.
6. The groups present their findings to the class, the school, the extended school community, and to Jack, with children from each group acting as tour guides for Jack's historic tour of the town.

Extension activities

Children could

- publish their Great Famine presentation on the school website given permission for the use of images from copyrighted sources
- adapt similar projects on local history and local geographical sites, using the National Archives, library and museum resources
- present the project in other formats, CD ROM, or in a book format.



Project Jack's Return, Swinford NS., Co. Mayo.

The following case study illustrates an integrated approach taken over a longer-term period, where the teacher and the class used multimedia authoring software, word processing, digital video editing, and image editing to conduct a local environmental study. This case study presents an overview of the approaches and of the various tasks involved and demonstrates how ICT was used to integrate the subjects of History, Geography, Visual Arts, and English. The project culminated in the creation of a CD-ROM based on the local history of their town. The creation of this project took approximately one month to six weeks of work.

Exemplar Nine

A case study of a local history project: Shopfronts of Clonakilty

Curriculum Area/s	Strand/s	Strand unit/s
Language: English	Competence and confidence in using language	Oral: developing competence and confidence in using oral language Writing: developing competence, confidence and the ability to write independently. Reading for pleasure and information
SESE: History	Local studies Continuity and change over time	My locality through the ages Buildings, sites or ruins in my locality Homes, housing and urban developments
Geography	Human environments	People living and working in the local area
Visual Arts	Drawing	Making drawings
Approaches and methodologies	<ul style="list-style-type: none"> questioning, observing, investigating and exploring using evidence recording and communicating developing a sense of place and space field work – going around the town to view the shops/premises group discussion – brainstorming 	

Level	Classes from 3rd – 6th. All classes can be involved to a varying degree.
Objectives	<p>The child should be enabled to</p> <ul style="list-style-type: none"> • hear, discuss and react to local story tellers • ask questions about natural and human features and processes in the environment and their inter-relationships • use library facilities outside of school <ul style="list-style-type: none"> <i>learn to research using various and different media</i> • present ideas that are relevant to the subject in a logical sequence <ul style="list-style-type: none"> <i>realise and discover the importance of planning and preparation</i> • engage with the writing of one piece over an extended period • write independently through a process of drafting, revising, editing, and publishing • choose a form and quality of presentation appropriate to the audience • take part in co-operative writing activities • actively explore some features of the local environment: <ul style="list-style-type: none"> <i>streetscape</i> • present findings using a variety of media • identify, discuss, and record aspects of local human environments which are considered attractive • learn about and come to appreciate and respect the people and communities who live and work in the locality: <ul style="list-style-type: none"> <i>local shop keepers</i> • explore, investigate, and come to appreciate the major features of the built environment in the locality • draw from observation • work independently and as part of a group.
ICT resources	<p>Ideally a number of computers in the class room</p> <p>Hardware: digital scanners, CD writer/s, digital camera/s, digital video camera, data projector,</p> <p>Software: Opus Pro, Hyperstudio, MGI Videowave, MSWord, PaintShop Pro</p>

Other resources

Pen and paper, reference material, local resources,
Colours and paints.

Preparatory activities

Organise children in groups or pairs. Background work on familiarisation with the features and use of the programme. In this case the children learned how to use the programme beforehand – the teacher created a manual guide with 16 lessons to using Opus Pro. This preparation was completed over a number of months.

Methodology

1. Chose topic – in this case the class decided to create a CD on the shop-fronts of Clonakilty.
2. Conduct an initial fieldtrip to choose the shop fronts which will be included, followed by brainstorming to choose the particular premises.
3. Examine other CD ROMs for ideas with regard to layout, presentation, content etc.
4. Plan the project on the blackboard and in copies.
Decision points include: layout of CD, style and look of CD, how many images and videos are needed, how will the tasks be divided among groups?
5. Children conduct research – using questionnaires, books, CD ROMs and the Internet. Involve parents and grandparents in eliciting information on changes in the locality.
6. Devise a questionnaire to elicit information from shop owners. Children conduct this questionnaire on their field trips.
7. Children design layout of pages.
8. Teacher and children take photos and videos of the selected shops and areas for study.
9. The teacher and the children edit photos and videos.
10. The children write up accounts of each of the areas in the survey – using a word processing package. Complete this first separately, drafting and redrafting for later inclusion in the CD.
11. Create the CD ROM using Opus Pro or similar software, inserting links, buttons etc.
12. Insert content and pictures and videos.
13. Design a quiz which goes at the end of the CD ROM
14. Review the work on an ongoing basis.
15. Publish and present CD.

The following exemplar is presented as a description of a long term project which was conducted over a period of months, in a multi-class situation (3rd to 6th class) in a small rural school. The children create a project on the fields and fences of their local area, covering four modules – Archaeology, Architecture, Folklore, Flora and Fauna. This exemplar shows integration across a number of curricular areas, covering a wide range of content objectives, and provides opportunities for linkage, and further development into art projects. The project on the fields and fences of County Sligo, is a sample of one school's work for a local joint project developed in collaboration with eight other schools and co-ordinated through the Education Centre. The entire project can be viewed at <http://www.sligofieldfences.com>



*Batik of the fields and fences project,
fifth and sixth classes, Ballinlig N.S, Sligo*

Exemplar Ten

A heritage project on fields and fences in Sligo

Curriculum Area/s	Strand/s	Strand unit/s
Language: English/Gaeilge	Competence and confidence in using language	Oral: developing competence, confidence in oral language Writing: developing competence, confidence and the ability to write independently
SESE: History	Local studies Story	Buildings, sites or ruins in my locality Feasts and festivals in the past, Stories from the lives of people in the past
SESE: Geography	Human Environments The natural environment	Natural environmental features and people The local natural environment

SESE: Science	Living things	Plants and animals
SPHE	Myself and the wider world	Developing citizenship

Level	Third to sixth classes
Objectives	<p>The child should be enabled to</p> <ul style="list-style-type: none"> hear, discuss and react to local story tellers <i>develop language and communication skills through interviewing</i> use library facilities outside of school learn to revise and redraft writing choose a form and quality of presentation appropriate to the audience take part in co-operative writing activities actively explore some features of the local environment, <i>area of a town or village, ruined building (motte and bailey), site of an old Mass path, prehistoric site, farmyard, field and farm patterns</i> present findings using a variety of media <i>collaborate with his or her peers to produce a wide variety of materials, stories, poems, art work, drawings, batik, and culminating in material for a book on the project</i> collect local ballads, stories and traditions draw from observation ask questions about natural and human features and processes in the environment and their inter-relationships investigate and become familiar with some natural features in the local environment <i>explore local sites for geographical, archaeological, historical, social, economic, evidence</i> observe, identify and investigate the animals and plants that live in local environments explore local traditions and folklore. <i>develop an awareness, knowledge of and appreciation of their heritage</i>

Approaches and methodologies

- Developing a sense of place and space, field trips
- exploring and investigating
- interviewing, talk and discussion
- drafting and redrafting, personal writing
- recording evidence, recording stories
- collaborative work, group work
- brainstorming, surveying, measuring
- exploring the lives of people in the past.

ICT resources

Computer in the classroom, word processing software, Hyperstudio, Internet access, digital camera, scanner, scanning software.

Other resources

Art and drawing materials, interviews with local land owners, Pencils and paper (writing journals).
Prepared materials – questionnaires from the project co-ordinator.

Preparatory activities

Set the goal of the project – to record and survey a limited area, one square kilometre in the school locality.
Make contact with local historians, etc.
If it is a joint project, establish contact with other schools to co-ordinate the work.

Methodology

1. Examine the local map/s of the area to select the square kilometre, which would be the focus of study in the project. Gain permission from the landowners to use the land for the study.
2. Make contact with local people who have interest in history and heritage, or local historians.
3. Prepare a list of questions to guide the study on the following areas:

Architecture: e.g. stiles, dry stone walls, mortared stone walls, earthen banks, piers, fencing, ridges, boundaries and how they have changed, wrought iron gates, sheep passes.

Archaeology: middens from the Stone Age, (shell middens), motte and bailey from Norman era, ring forts, famine pot,

Folklore: stories from the past, weather lore, place names, proverbs

Flora and fauna: badger setts, foxes, rabbits, house martins nesting, rookery, starlings, magpies etc.

4. Organise groups in the class and share the areas of the work. Organise requirements for field trips, drawing material, cameras etc.
5. The children study old maps and compare them with maps of today to see what has changed. For example, old ridge patterns show evidence of potato growing in the past. Larger field sizes may indicate that old boundaries have been removed.
6. Organise field trips. The number of field trips required will depend on the size and scope of the project. Record drawings, sketches and digital images on the field trips along with notes, and measurements of any archaeological sites, and of features such as fences, and walls.
7. Some groups interview older people and parents and grandparents and record older people telling stories from the past.
8. Class-based work begins after the material is collected. The children work in groups on different aspects of the project, and write up accounts of each section. The children sketch out drawings of each of the features. They write stories and poems based on stories from the past, and on proverbs. They may record their projects in scrapbooks or note books, and after redrafting, they write these up on the computer.
9. The children scan in their drawings, and artwork, and pictures recorded on field trips using the digital camera.
10. The project can be presented in different formats, a book or magazine, a CD Rom or website. Select the template for page layout. Edit and redraft items for inclusion.

Extension activities

Children could

- extend the project by integrating with visual arts and other activities, for example working with a visiting artist to create a mural or a batik
- explore other facets/themes relating to their local area, music, dance, etc.
- produce and present projects in different formats, using audio, text, images, etc.
- continue to collaborate with other local schools to complete wider projects on other local environmental or historical features, e.g. the local seashore, an old castle etc.

Multimedia authoring and presentation software: benefits for children

The effective use of multimedia authoring and presentation software in teaching and learning helps children to develop a range of skills, and widens their knowledge and understanding of ICT. Multimedia presentation software supports a range of learning styles, and motivates the visual, auditory and active learner.

Using multimedia authoring and presentation software, children can

- plan, develop, refine and produce classroom projects
- improve their writing skills as they practise using the editing tools that make drafting and re-drafting easier
- learn to present project work in an interesting and stimulating way
- investigate the familiar world from new perspectives
- look closely at common objects using close-up photos from a digital camera, and thus engage their curiosity
- create and maintain records of significant events in the classroom or school year using the digital camera
- collect images, sounds and materials for classroom projects when they are exploring in the environment or during a field trip
- develop and refine scripting and storyboarding skills, as they organise their thoughts and ideas to create a multimedia presentation
- be motivated to produce accurate text and refine their presentations for a specific audience, for example, parents
- explore a range of tasks engaging all of the senses, visual, auditory, kinaesthetic, thus catering to their individual learning style
- engage their auditory senses and discrimination by adding sound and comments to multimedia presentations
- use technology to control, manipulate or communicate musical information, creating sounds and sequences of sounds
- enjoy recording their own voice or the sounds from their environment using a microphone and tape recorder
- clarify their thinking as they work through the steps in putting together a multimedia presentation
- learn to work in teams and collaboratively, with each group offering a valuable contribution to the overall finished product
- develop habits of responsibility, through the handling and care of digital equipment
- develop critical analysis skills, for example, using the digital video to record practices for a drama session, and playing them back to analyse it.

Multimedia presentation software: teacher uses

Teachers can use multimedia presentation software as a teaching tool to present material and projects in all curricular areas and to support children's learning right across the curriculum.

Teachers can also use multimedia presentation software to:

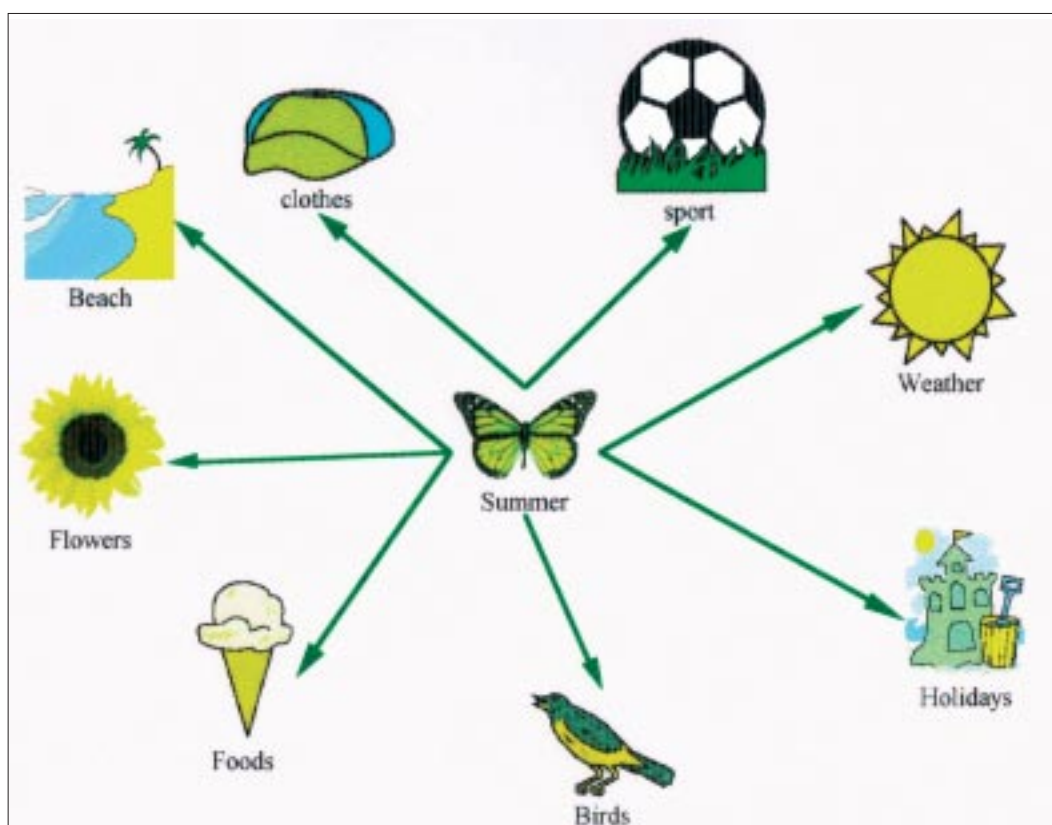
- create language experience materials for infant classes and children with Special Educational Needs
- create multimedia writing frames to support the recording of text, sound and pictures
- create multimedia (talking) books
- create and maintain records of school trips, trails, outings, events and special days using the digital camera and presentation software
- save these records (photographs) on the computer, to be placed into desktop publishing, word-processing and multimedia programs, etc.
- maintain records of significant events in the classroom, and school year: school outings, celebrations, sports days, school matches, school concert, school play, school debates etc. using digital video
- share these records of special school days (sports, concerts, etc) with parents
- use digital images and records for collaboration projects with other schools
- replay significant school events for the whole class, on the video or DVD player, or using the digital projector and screen
- create digital portfolios of pupils' work in different subjects
- evaluate children's work in areas that require close observation, for example, the teacher can record children's performance in physical education using digital video. They can later replay it to analyse areas where improvement in technique can be made
- create teaching materials, for example, by importing pictures from CD- Roms and the Internet into a presentation for a particular topic area
- create slide displays for different subjects, for example, showing the work of a famous artist using images retrieved from online gallery collections
- prepare activities prior to class outings, or create displays for new material.

Concept-mapping software

Concept mapping enables children to create a visual network or web to represent their ideas on a given topic. Also referred to as semantic network software, concept mapping software can be used to assess children's understanding of concepts based on their representations of key ideas, and the inter-relationships or connections they make between these concepts. Concept mapping is recommended in the science curriculum as a tool to assess the child's understanding of scientific ideas and processes.

While specific software packages have been created for concept mapping, a word processing package also contains the necessary concept mapping symbols and arrows. Some examples of concept mapping software suitable for schools include:

Title	Publisher
Inspiration Kidspiration	TAG Learning
Draft: Builder	Don Johnson Special Needs



Literature concept maps, Fifth and sixth classes, Monastery C.B.S., Tipperary

Exemplar Eleven

Responding to a class novel using concept mapping software

Curriculum Area/s	Strand/s	Strand unit/s
Language: English	Emotional and imaginative development through language	Oral language: developing emotional and imaginative life through language Reading: responding to text
Approaches and methodologies	Talk and discussion Concept mapping	
Level	Fifth and sixth classes This activity may be adapted for similar work on other books with other classes as appropriate.	
Objectives	<p>The child will be enabled to</p> <ul style="list-style-type: none"> respond to the elements of fiction (such as setting, character, plot or problem, and solution) as they apply to a specific piece of literature (class novel), using concept mapping software demonstrate their use of oral language to represent concepts (ideas) and attributes (relationships between ideas) in their concept maps. 	
ICT resources	<ul style="list-style-type: none"> concept mapping software (e.g., Inspiration or Kidspiration) Printer. 	
Other resources	<ul style="list-style-type: none"> class novel pen and paper for creating paper-based webs. 	
Preparatory activities	<ul style="list-style-type: none"> Extensive work can be done on concept maps in other subjects – organising thoughts in the writing process, assessing children's understanding in science. Practise organising ideas for project work, dividing tasks in all a group work Children will initially practise drawing concept maps on paper, but quickly appreciate the benefits of creating them with the ability to edit and revise their concepts. 	

Methodology

1. The teacher introduces the concept mapping software by showing the relationships between the main characters in the novel. The teacher introduces the children to the basic concept symbols and arrows or connectors between concepts.
2. The teacher shows children the Inspiration templates (available with the software), and invites children to use The Language Arts –Literary Web to structure their discussion of the class novel within their groups.
3. Children are divided into groups to create a collaborative concept map of one element of fiction (character, setting, problem, or resolution).
4. Each group presents their concept map to the class by using a digital projector, or by simply rotating from each group to show the group's work to the class.

Extension activities

Children could

- use concept maps to record their ideas at the start point of a lesson in science
- use concept mapping software to structure their ideas when planning a writing activity
- use concept mapping software to indicate cause and effect by organizing their ideas in a concept map representing a flowchart
- explore information on how to build concept maps from websites, for example,
<http://www.cotf.edu/ete/pbl2.html>.

Concept mapping software: benefits for children

Using concept mapping software can support children in their learning in the Primary School Curriculum in a number of ways.

It can enable the child to

- generate ideas by brainstorming
- visually represent his or her ideas and concepts in a given topic area, thus aiding the visual learner
- provide a framework to help the child in communicating complex ideas
- organise his or her ideas, and take responsibility for his or her own learning
- plan and organise project work, where there are a lot of elements involved, for example: long text passages, hypermedia, graphics, websites
- integrate new and existing knowledge
- assess his or her own understanding and to diagnose misunderstanding, by comparing earlier maps with later maps on the same concept or idea.

Concept mapping software: teacher uses

Teachers can use concept maps to

- aid their planning in subject and topic areas
- create overviews of linkage within a subject
- provide a framework for the integration of curricular areas (integration web)
- organise classroom management issues such as grouping arrangements, inclusion of children requiring resource teaching or learning support, etc.
- use the child's concept map to evaluate his or her learning in a given topic area
 - by examining the child's concept map and comparing it with earlier maps made by the same child on the same topic
 - by comparing it with other maps by the same child which represent different perspectives
 - by comparing it with curriculum objectives
 - by comparing it with an expert's (teacher's), concept map.
- assess the child's progress by counting the concepts and relationships between concepts, to determine the breadth and depth of child knowledge
- keep records of children's developing knowledge or concepts in a particular curricular area.

Spreadsheet and database software

Spreadsheet software

Spreadsheets are programs that are designed to facilitate the organisation and manipulation of numbers and were originally designed for use in accountancy. Although spreadsheets can contain database elements, spreadsheets offer additional features, including mathematical functions and graphing functions.

Some examples of spreadsheet software include:

Title	Publisher
2Investigate	2Simple Software
Excel	Microsoft

The following exemplar demonstrates children's use of spreadsheet software to analyse and illustrate the results of a class survey.

Exemplar Twelve

A class survey in Maths using spreadsheet software

Curriculum Area/s	Strand/s	Strand unit/s
Mathematics	Data	Representing and interpreting data
Approaches and methodologies	Talk and discussion, communicating and expressing, Collecting, organising and handling data	
Level	This exemplar can be adapted for use with any class level.	
Objectives	<p>The child should be enabled to</p> <ul style="list-style-type: none"> • represent mathematical ideas and processes in different modes: verbal, pictorial, diagrammatic and symbolic • compile and use simple data sets <p><i>collect, and enter data in a spreadsheet, using spreadsheet software</i></p> <p><i>represent data in the spreadsheet using the appropriate graph (e.g., pictogram, single and multiple bar chart, simple pie chart, scatterplot), read and interpret graphical representations of data, created using the spreadsheet software.</i></p>	
ICT resources	<ul style="list-style-type: none"> • spreadsheet software (e.g., Excel, Junior Viewpoint) • computer, printer. 	
Other resources	Paper-based surveys, blocks, Unifix, etc. pencils and paper.	
Preparatory activities	Children will have practise using data, gathering data, organising data, representing their findings using unifix or blocks, making graphical representations on paper.	

Methodology

1. The teacher divides the class into a number of small groups. Each group will collect data from the whole class on a different question, e.g., preferred pastime, preferred music artist, eye colour, and so on.
2. The groups design a simple questionnaire or data collection instrument. In order to ensure that the results are manageable, options for each category must be limited.
3. Each group surveys all children in the class (including members of their own group).
4. Groups enter the data for their category on a spreadsheet, and create a pictorial representation, e.g., pie chart, bar chart.
5. Each group presents their data set to the class. Large group discussion follows.

Extension activities

Children could

- survey the class using additional questions, and add the new data to the existing data sets
- survey the class using the same questions, at a later time and compare the new data with the previous data set
- feature the results of the survey on the class magazine (created using desktop publishing software)
- create a multimedia presentation to present the data to the large group
- Complete other topics such as
 - results of an activity in Science, e.g., grouping animals in a habitat study according to the number of legs each has
 - collecting and representing data on traffic surveys in Geography
 - survey of a streetscape in Geography, e.g., how many pubs, how many shops
 - survey of attitudes to a topic in SPHE, e.g., smoking.

Spreadsheet software: benefits for children

Spreadsheet software can support children's learning in the primary school curriculum by

- helping the child to develop reasoning skills as he or she makes hypotheses and carries out research to test them
- enabling the child to search for and investigate mathematical patterns and relationships
- providing tools that the child can use to synthesise and analyse large amounts of information
- facilitating the development of higher-order thinking skills by modelling 'what-if' processes. For example, 'if we double the price of our most popular school shop item, how much would this increase our overall profit for the school shop?'
- enabling the child to see data in a visual format, thereby facilitating their understanding
- providing a means for the child to discuss and record the processes and results of his or her work
- enabling the child to keep records of his or her work or that of groups or sports teams.

Spreadsheet software: teacher uses

Teachers can use spreadsheet software to

- create and maintain records of children's scores, for example, to perform calculations such as computing average marks or comparing marks with those of other classes and other years
- prepare templates with grid layouts to speed and simplify worksheet preparation
- prepare class timetables
- adapt timetables for individual children, for example children attending learning support classes and special needs
- create a spreadsheet to collate a record of the costs of classroom materials, and other resources
- maintain records of children's books and other classroom items.

Database software

Database software can be used to store, manipulate and retrieve data. A database is an electronic version of a filing card system, and because the data is stored electronically it facilitates tasks that would be difficult and more time-consuming if performed manually. Databases are capable of storing data in the form of text, sound and graphics. Before introducing children to electronic databases, teachers can support children in using and creating paper-based collections of information, e.g., a phone book, product catalogue, a library catalogue, a dictionary, and so forth. At primary school level, children's experience of databases may be through the use of spreadsheet software, however, junior database programs are available, for example, Junior ViewPoint.

Database software: benefits for children

Database software can support children's learning in the primary school curriculum by

- promoting the use of questioning and analytical skills as the child collects and organizes information
- facilitating the child's ability to organise and analyse groups of information or data
- enabling the child to analyse a single domain of study (e.g., animal types) using complex queries
- allowing the child to search the database for information in several fields
- supporting the child's understanding of information in a new way using visual representations of data
- helping the child to make the transition from concrete to abstract understanding as they move from graphing with physical objects to creating two-dimensional displays of information.

Database software: teacher uses

Database software provides support for teachers in maintaining records of curriculum content for teaching and learning, and also children's records. Teachers can also use database software to

- plan schemes of work
- create and maintain lists of contact information for children and their parents and guardians
- store information and records of childrens' work and class records
- keep records of class specific teaching materials and resources and their location
- keep records of school and/or class library books.

Programming software

Programming software refers to the range of software that enables children to execute commands using specific programming language. One of the programming languages most commonly used in schools is Logo. There are many versions of Logo available, including MSW Logo which is freeware downloadable from the web. The latest development of Logo language is called Microworlds Pro, Logo Computer Systems INC. (LCSI)
See www.microworlds.com.

Logo Software

Logo programming language was designed as a tool for learning. Logo is rooted in constructivist educational philosophy, which also informs the Primary School Curriculum. Logo is accessible to younger children and yet can be highly challenging for experienced users. Logo programming activities can include mathematics, language, music, telecommunications, science and robotics.

The most well known element of Logo – turtle graphics allows children to experiment with mathematical activities. Later developments included:

- the development of Logo Writer, with a word processing facility
- LEGO Logo, which uses Logo in conjunction with motors, lights and sensors in machines built out of LEGO bricks and other elements.

Logo can be used with or without a programmable floor turtle. The robot can be moved about on the floor by typing commands at the computer. For example, the command 'forward 100' tells the turtle to move forward in a straight line '100 steps', while 'right 90' tells it to rotate 90 degrees clockwise. Logo also has a built-in writing facility that allows it to draw the shape if it moves on a sheet of paper.

A common starting activity is to command the turtle to describe a square. The concept of a square can be approached through a child performing a series of movements following directions from peers that would lead him or her to walk the sides of a square on the classroom floor or in the playground. This concrete experience can then be replicated on screen by directing a similar turtle.

Logo therefore provides a learning activity that is at an intermediate stage between concrete experience and abstraction. At the simplest level, children must distinguish between the turtle's right and left and their own right and left. Children are engaged at a higher level in a mathematical activity that is more sophisticated. In this way, children can experiment with mathematical concepts in a semi-concrete way using Logo, and their actions are visible to them as they program the turtle on the computer screen.

Logo enables children to develop mathematical concepts and develop specific problem-solving skills in mathematics in an enjoyable and non-threatening way.

The following exemplar is a synopsis of a ten-lesson introduction to Logo turtle graphics, where the teacher introduces the children to Logo as a cross-curricular approach to learning about shapes and angles. In this example, the children worked with one computer in the class, which involved timetabling and planning. Children worked in groups and were timetabled for approximately ten minute sessions on the computer.

Exemplar Thirteen

A ten lesson programme using Logo to develop concepts of lines, angles and shape

Curriculum Area/s	Strand/s	Strand unit/s
Mathematics	Shape and space	2-d shapes, 3-D shapes, lines and angles
Visual Arts	Drawing	Making drawings
SPHE	Myself and others	Relating to others
Approaches and methodologies	<ul style="list-style-type: none"> • Talk and discussion, observing and recording, applying and problem-solving • Exploring and investigating, estimation and prediction 	
Level	Third and fourth, also suitable for fifth and sixth	
Objectives	<p>The child should be enabled to</p> <ul style="list-style-type: none"> • develop an awareness of line, shape, form and space • recognise an angle in terms of rotation • solve problems involving lines and angles • combine and make patterns with 2-d shapes • represent mathematical ideas in different modes • make hypotheses and carry out experiments to test them • use appropriate manipulatives to carry out mathematical procedures. <p><i>use LOGO to create programs and procedures that will successfully execute to make the required shape</i></p>	
ICT resources	<ul style="list-style-type: none"> • MSW Logo (Freeware, downloadable from the web) • computer/s • printer 	

Other resources

Pencils and paper

Preparatory activities

- Work with the children on developing their understanding of line, shape, angles, etc using concrete materials.
- The teacher will need a Logo manual or some sample lessons.
- The teacher could make activity sheets containing Logo directions and encourage pupils to predict the shape that will be drawn before trying it out with a floor or a screen turtle.
- Create a help sheet showing the common commands which the children can refer to. e.g.

Forward	fd	Back	bk
Right	rt	Left	lt

More information on Logo can be found at the Logo Foundation site:

<http://el.media.mit.edu/Logo-foundation/index.html>

Methodology

1. The teacher discusses computer programmes and how programmes are created. Introduce angles and right angles. Children walk right angles to make squares on the floor.
2. Children devise a formula for a square based on their 'walks'. *[fd 100 rt 90 fd 100 rt 90 fd 100 rt 90 fd 100 rt 90]* Explain the need to change the children's 8 steps to 100 in the formula. Discuss how to go left and the need to increase the number of steps.
3. Discuss basic commands e.g. – *fd* , *bk* , *rt* , *lt* , *cs* , *st* , *ht*. Examine the properties of a square, with the children. The teacher writes the formula for square, as dictated by the class, on the whiteboard. Introduce the repeat command. Repeat *4[fd 100 rt 90]*. Emphasise the need for correct syntax.
4. Discuss properties of squares. Introduce procedure "to square". *"To square' [fd 100 rt 90] end*. Each child then defines and makes a square of side 100.
5. Discuss the limitations of defining a square with fixed sides. Discuss with the children how to make squares of various sides. Introduce variables (not by name). *To square: sides [fd :sides rt 90] end*
Each child then draws Square 20 Square 100.

6. Introduce the triangle, talk about the angles in a triangle. The children use paper to tear off the angles in a variety of triangles. Children will observe that when reassembled they make a straight angle. (a half circle - 180°). Discuss the properties of an equilateral triangle with the children. Children look at the outside angles and mimic the turtle's movements. Children will notice that in order for the turtle to make a 60° angle inside, he has to turn 120° .
7. Each child, makes a triangle *rt 30(to turn the turtle)*
Repeat 3 [fd 100 rt 120].
8. The children attempt to define procedure for a triangle.
9. Introduce the following procedure to the class:
"square *rt 10 square*". Ask the children to predict the outcome. Children may predict that it will make two squares side by side. The teacher shows it visually using two cut-out cards at an angle of about 10° . The children may observe that a continuation of this pattern would make a circle. Elicit the number of 10° in a circle. Try several repeats, e.g. 30 repeats are too few, as the pattern remains unfinished. Children will discover by estimating and trialling, that it would take 36 repeats.
Each child takes turns to make the pattern: *36 [square rt 10 square]*
10. The children 'walk' a circle and discuss their findings. Children will come up with *Repeat 30 [fd 30 rt 1]* to make a circular type shape. Discussion will elicit the need for small steps and small turns. Following discussion on the number of repeats, decide on 360 as there are 360 degrees in a circle. This leads to the procedure *Repeat 360 [fd 1 rt 1]*. Each child can then attempt to create a circle.

Extension activities

Children could

- use the Roamer – a robot that can be used in a wide variety of ways, which captures pupils' interest and imagination when they are presented with hands on, problem-solving activities.
- create more complex designs in senior classes.

Control technology

Control technology has many benefits in supporting the approaches and methodologies of the Primary School Curriculum. It enables pupils to develop problem-solving strategies and skills at their own pace. Pupils use concrete strategies to externalise their thinking, which allows them to reflect on what they are doing and how they are doing it.

Control technology allows children to explore a range of features in mechanical design such as power, speed, gearing, friction, sensing, and feedback. This technology can be used to build and programme models to perform various tasks. The children plan what they want the model to do, and then write computer programs accordingly.

The exemplar that follows shows how children can learn both technological concepts and skills, within the context of a creative project in Language. The project was carried out over an extended period - the children in this example had no prior experience of Lego Mindstorms. Control technology is not limited to the uses described in this exemplar. Additional information and examples of the versatility of use may be seen at <http://empoweringminds.mle.ie>



Exemplar Fourteen

Using Control Technology to design and make a scene from a story

Curriculum Area/s	Strand/s	Strand unit/s
Language: English	Emotional and imaginative development through language	Oral: developing emotional and imaginative life through writing and oral language Reading: responding to text
Mathematics	Shape and space	2-D shapes, 3-D shapes, lines and angles
Visual Arts	Construction	Making constructions
Approaches and methodologies	Talk and discussion, problem-solving. Observing and recording, communicating and expressing. Exploring and investigating.	
Level	Second and Third class in this project. Lego Mindstorms has been successfully used from third to sixth classes.	
Objectives	<p>The child should be enabled to</p> <ul style="list-style-type: none"> • discuss favourite moments, important events and exciting characters in a story • extend his or her response to increasingly challenging reading material <ul style="list-style-type: none"> <i>learn about Oscar Wilde's story, 'The Selfish Giant' by reading the story aloud in class and writing poems and stories based on the tale</i> • explore and experiment with the properties and characteristics of materials in making structures <ul style="list-style-type: none"> <i>design a model garden which includes various characters from the story and elements from his or her own life, using Lego Mindstorms and the RCX brick</i> • solve problems involving lines and angles <ul style="list-style-type: none"> <i>develop his or her ideas of design, control, sensing, and programming through project-based learning</i> • develop an awareness of line, shape, form and space. 	

ICT resources

- computer/s
- programming software, e.g. Lego Mindstorms – a robotic construction kit launched by the LEGO Group
- the “RCX Brick,” is a programmable LEGO brick that contains a tiny computer, batteries, a display screen, and circuitry to operate motors and connect to sensors.

Other resources

- a large collection of LEGO building blocks, decorative pieces, and newer pieces like gears, beams, axles, and other mechanical components
- *The Selfish Giant* text
- pencil and paper to diagram draft model plans

Preparatory activities

- To develop children’s spatial awareness when working with floor and screen robots, provide resources to help them to visualise ‘how many’ or ‘how far.’
- Cut out floor robot outlines to lay on the floor and use them to work out how many units the robot needs to travel to reach a specified place. Coloured ‘clocks’ showing 30°, 60°, 90°, 120°, 150° and 180°, left and right, can help pupils to develop an awareness of angles.

Methodology

1. Having visited Merrion Square in Dublin to see Wilde’s statue, children read the story ‘The Selfish Giant’ aloud in class, and write poems and short stories based on the tale.
2. The teacher demonstrates functions of the programming software.
3. In groups, children begin their designs for creating a garden which contains characters from the story, as well as elements of their own lives.
4. Children use Lego Mindstorms and the RCX brick to design a garden and various characters from the story. To construct the garden, arrange four approximately 1 metre square pieces of pressboard in a square. On this base, the children re-create the central scene and characters from the story – a large garden walled off from the rest of the city, a tree in the garden, the giant, and the little boy.
5. The children may also wish to represent elements from their own lives in the scene.
 - Outside the walls of the garden they can include a road filled with traffic, and modern buildings. They

intersperse little security cameras throughout. They put a large sign on the walls protecting the garden reading, "Trespassers will be prosecuted."

- The children use the RCX brick to program patterns of movement and beep sequences into several of the cars out-side the garden walls
 - The giant is the biggest single LEGO construction, and it includes an RCX brick programmed to make its eyes flash and its arms rotate back and forth.
 - The children also build swings and merry-go-rounds in the playground which are activated by an RCX.
6. In groups, children share their projects with the class, and discuss their use of functions of the software to achieve their final product.

Extension activities

Children could

- design and make floor mats representing the school, the local area or a local park
- create similar projects based on scenes from a class novel, events and elements in history, legends and sagas.

The teacher could

- make stepping stones for pupils to use with a floor turtle or Roamer – these can be used to create a number line, or to develop letter recognition and alphabetical order.



Programming software: benefits for children

The use of programming software in the primary school curriculum can benefit children by

- developing children's oral language as they talk and discuss the possible outcomes of their programmes
- developing the confidence of reluctant readers who can manage the abbreviated language in LOGO
- giving children a sense of ownership of their work, as they create new projects or programmes
- supporting children's learning at a variety of ability levels
- enabling children to progress at their own rate
- teaching children that mistakes can be used as opportunities for further learning
- supporting the visual learner, who can see the results of his or her procedures enacted in a concrete way
- motivating the child through active engagement associated with a fun activity
- supporting an increase in children's understanding as they practise listening to and following instructions until they are capable of following quite complex sequences
- developing children's abilities in formulating and providing instructions for others so that they can be easily understood
- developing social skills through interaction and collaboration with other children, and engaging in talk and discussion on the problem to be solved
- developing the child's problem-solving strategies - prompting the child to engage in collaborative discussions, pondering questions, predicting results and seeing immediately the effects of his or her decisions.

Programming software: teacher uses

Teachers can use programming software to

- engage the children in cross-curricular activities
- enhance children's mathematical thinking
- integrate with designing and making and pattern work in visual arts
- provide a context, setting and material for oral language development
- support a whole school approach which can be used progressively at different levels with different age groups
- support group work and classroom organisation
- cater for multiple intelligences
- support a varied approach to differentiating for children's learning needs, for example, to support the kinaesthetic learner.

Content-rich software

For convenience, content-rich software refers to reinforcement software, simulation software and reference software. Though content-rich software is traditionally available on CD-ROM, many companies now provide versions of their software on the Internet, (software on-line) including support material and updates.

Reinforcement software

Reinforcement software can support learning at different class and ability levels and in a variety of subjects. At one level, it offers children opportunities to work on specific tasks, while at another level it can form an *integrated learning system*, which is designed to teach, assess and record the activities of children while they are engaged with the software. Many content-specific software packages provide most or all of the following instructional tools for child-use:

- tutorials
- simulations
- graphing tools
- practice problems or workouts
- assessments
- performance feedback.

One of the benefits of content-specific software is the opportunity it provides the learner to engage or interact with the material. However, curriculum software should contain meaningful interactivity which has an educational purpose and allows children to engage with content in ways which promote learning. Clicking endlessly is not regarded as meaningful interactivity, rather the child should be set tasks, posed problems, asked questions etc. within the context of the application. Reinforcement software typically offers a management system, whereby the teacher has the option to select the concepts and skills that the child can access in a given content area.

Reinforcement software can be used to support learning in every subject area:—science, history, geography, etc. and has developed wide usage in the areas of language and mathematics.

In the mathematics curriculum, reinforcement software can support children in mathematical activities such as

- classifying and matching
- extending patterns and sequencing
- counting and analysing of numbers
- understanding place value
- using the four operations (+, −, ×, ÷)
- manipulating fractions and decimals
- recognising and interpreting data

- performing operations involving time, weight, money, capacity, length and area
- recognising basic geometric shapes.

Some examples include:

Title	Publisher
Millie's Maths House	Edmark/Riverdeep
Breakaway Maths	SEMEREC, Granada Learning
Number Shark	White Space
Intellimathics	Inclusive Technology Ltd.
Crystal Rainforest 2000	Sherston

In the language curriculum, reinforcement software provides children with opportunities for

- recognising patterns
- developing an awareness of left to right and top to bottom orientation
- colour-matching
- letter recognition
- auditory discrimination, visual discrimination
- phonological skills, exploring sound-letter relationships, rhyme, auditory memory
- word recognition
- spelling practice through structured spelling games
- building basic sight vocabulary
- sequencing tasks
- cloze procedures
- learning and responding to nursery rhymes, poems and songs
- reading comprehension.



Interactive books

Interactive books are one example of reinforcement software for English. Interactive books can be read by a child, by a group of children, or by the whole class on a computer or a large screen. Each page has a number of interactive buttons, and the child can activate the book by clicking on the buttons on the computer screen. Some characters in the books may be animated and may provide a verbal response when prompted by the child (using the mouse). Such stimuli can provide a context for prediction, questioning and language development.

Interactive books can enable children to participate in collaborative group discussion about the meaning of the text. The highlighting of text supports children's word identification. Children may revisit parts of the book in order to become more familiar with the text. Through the use of the interactive visual stimuli, children can be encouraged to discuss the scene that is presented on screen.

Some examples of interactive books include:

Title	Publisher
Wellington Square	SEMERC
The Oxford Reading Tree Series	Sherston Software Ltd.
Living Book Series	Tag Learning Ltd., Broderbund
UKanDu Little Books software	Don Johnston Special Needs Ltd.

Reinforcement software: benefits for children

The use of reinforcement software in the Primary School Curriculum can benefit children by

- reinforcing concepts and knowledge
- providing opportunities to practice and repeat concepts previously learned
- supporting and motivating the child by providing immediate feedback and reinforcement
- adapting to suit the needs of the auditory learner and the visual learner
- helping to develop the child's comprehension skills, and strengthening word recognition abilities, through the use of interactive books.

Reinforcement software: teacher uses

Teachers can use reinforcement software to

- devise supportive lessons for pupils with specific learning needs.
- allow children who are familiar with basic concepts to pursue enrichment activities
- help in identifying the areas where a child needs support, as they can evaluate the child's progress, through the progress records
- develop extension materials based on the activities in the programme.

Simulation software

Simulation software, often referred to as adventure software or game-based learning, developed from the powerful simulation type software often used in business and in training to tackle complex issues in a safe environment.

Its application in education can be successful when applied in problem-solving situations, or in adventure type scenarios. The teacher should be aware of the purpose and target activity of the software, as there are many applications which have little or no educational value, and are more suitable for children's leisure use. Software in the form of interactive adventure games can be motivating and absorbing for the learner and can provide an immersion learning environment.

Exploratory type software provides children with simulations, micro-worlds and adventure games that replicate elements of the real world. Simulation software has many applications in activities such as science – exploring scientific concepts such as forces, in history – where the learner can go back in time, in geography – where the learner can simulate travelling and exploring in other lands.

Simulations can capture a child's imagination. They are designed to make children ask questions and try out different scenarios and view the effect of any changes they make. Children are engaged in both the process and the outcome of their questioning, interpretation and analysis of information. Exercises can be achieved on a variety of levels. Children can draw on their own experiences to guide their actions and decisions, both current and past, so integrating what they may already know with what they are learning. Some examples of widely used adventure and simulation type software include:

Title	Publisher
The Logical Journey of the Zoombinis	TAG
Where in the World is Carmen Sandiego Carmen Sandiego Junior Detective	Broderbund Software/Riverdeep

Simulation software: benefits for children

The use of simulation software in the primary school curriculum can benefit children by

- making learning fun
- developing the child's powers of concentration and ability to think clearly
- providing situations to develop the child's language, comprehension and discussion skills, when they explore and investigate problems, while working with peers
- presenting situations to develop the child's cooperation skills as they learn to consult and resolve problems
- posing problems to develop the child's spatial and directional sense, e.g. manipulate areas in the programme environment
- providing opportunities for the child to practice sorting and classifying information

- allowing the child to take risks, take on different roles and behaviours in a non-threatening environment
- providing the child with the opportunity to experience decision-making and the simulated consequences
- engaging the child in their own learning, when they investigate and discover for themselves or under the guidance of the teacher
- providing a facility for the child to monitor the results of their actions
- giving the child a sense that they are in control of their own learning
- promoting active learning as the child creates and re-creates an environment, as well as interacting with it
- providing opportunities to develop the child's problem-solving skills
- extending the child's ability to think critically, forming reasons for his or her actions as he or she works closely with other children
- bringing the child's abstract concepts to a more real understanding.

Simulation software: teacher uses

Teachers can use simulation and adventure type software to

- make learning more meaningful and enjoyable for the children
- create follow on tasks for classroom work , e.g. written tasks, problem-solving, research, which the children are engaged with
- integrate across curricular areas
- present material to the whole class using a data projector
- develop a particular theme, based on the subject/s of the simulation
- evaluate childrens' progress in the activities and problem-solving tasks. (through the records)

Reference software

Reference software can provide children with access to a range of information resources to support project work and learning in a variety of curriculum areas. The principal forms of reference software are

- multimedia encyclopaedias, atlases
- subject specific informational resources
- the Internet. (The Internet is treated separately in chapter 4.)

Reference software can be used to support all curricular areas. For example, there are many software packages that aid pupils in their investigation into music and composition. Children can also use CD Roms or the Internet to research musical instruments, composers, and a wide variety of types of music from different cultures.

In order to use reference software effectively, children need to acquire information management skills. These skills in information seeking and handling should be developed gradually in response to the child's needs as he or she progresses through the school. At the same time, it is important that the child learns to collate, summarise, and present the information that is accessed. Much of the value of using reference software will be lost if the child just engages in cutting and pasting information retrieved from the software.

Children should be enabled to

- decide what information is needed
- select appropriate resources
- search for the information
- retrieve the information
- record appropriate information
- analyse the information
- formulate and present information
- review and evaluate the task.

A further discussion on information handling skills is available in Chapter Four in relation to searching for and evaluating information from the Internet.



The following exemplar describes children's use of reference software to learn about other countries.

Exemplar Fifteen

Learning about countries of the world using reference software

Curriculum Area/s	Strand/s	Strand unit/s
SESE: Geography	Human environments Natural environments	People and other lands Physical features of Europe and the world
Approaches and methodologies	Observing, questioning, recording and communicating, researching, using pictures, maps and models.	
Level	Third, fourth, fifth and sixth classes	
Objectives	<p>The child should be enabled to</p> <ul style="list-style-type: none"> study some aspects of the environments and lives of people in one location in Europe and one location in another part of the world learn about a small number of the major natural features of Europe become familiar with the names and approximate location of a small number of major world physical features carry out simple investigations and collect information from a variety of sources sort, group and or classify data on people, events, and natural phenomena using a range of appropriate criteria record and present findings using a variety of methods, including oral, written, and using ICT. 	
ICT resources	<ul style="list-style-type: none"> reference software (e.g., Encarta, or "Where in the World is Carmen Sandiego?") teacher-designed materials (e.g., fact file activity sheet, group progress record) multimedia presentation software the Internet scanner, scanning software 	

Other resources

Encyclopaedia, maps, globes, Pencils and paper,

Preparatory activities

Teacher familiarisation with the software and availability of other research resources.

Methodology


1. The class is divided into groups of three. Each group researches a particular country. Groups are given a fact file activity sheet. These contain questions and tasks, which the children attempt, e.g.,
 - name some important industries in the country
 - draw the flag
 - copy and paste a picture related to the country on to the activity sheet
 - identify the 3 highest mountains.
2. The groups research their chosen country and attempt to collect information needed for the various tasks. They record their answers and compile their work in a folder. Their work may include some of the following:
 - identify sources of suitable information,
 - access suitable information in a CD-ROM
 - search the Internet and navigate suitable portal websites, e.g., www.scoilnet.ie
 - download material from the Internet
 - copy graphics where appropriate
 - use e-mail to collect information or to collaborate with children in other schools
3. The groups may present their findings to the class orally, using presentation software, or in written and diagram format.

Extension activities

Children could

- design a poster to promote a particular country, including, for example, six different pieces of information about the country
- create a multimedia presentation on a particular country and present to other classes using various headings such as
 - name and origin of name
 - physical features
 - climate
 - history
 - significant sites and buildings
 - culture

- publish the project on a school website
- collaborate with schools in the countries under study (using video-conferencing equipment, or e-mail) to extend their understanding of other cultures.



Where in the World?

Country: _____


Continent: _____

Capital City: _____

Language(s): _____

Industries: _____

Exports: _____

Flag: 

3 Interesting Facts: _____

2 Famous Landmarks: _____

Cooperative Learning Group: _____

Insert a map of the country here

Insert a picture related to the country here

Sixth class, Sacred Heart School, Portlaoise, Co. Laois

Reference software: benefits for children

The use of reference software in the primary school curriculum can benefit children by

- providing access to a vast amount of information
- encouraging children to actively engage in learning (in order to retrieve, analyse, and select information)
- vividly presenting events or processes
- maintaining children's interest through the use of visually stimulating multimedia resources
- supporting the child's understanding of the organisation of information in library and reference material
- facilitating thematic exploration through the use of hypertext links (the highlighted text links users to other related materials)
- fostering children's reading and comprehension skills such as scanning for meaning, prioritising and summarising.

Reference software: teacher uses

Reference software provides support for teachers in planning lessons, developing activities, and maintaining records.

Additionally teachers can use reference software to

- set research tasks for children to study in groups or individually
- support children's use of paper encyclopaedia
- introduce children to search tools and terminology
- teach library and research skills such as using an index, using a table of contents, searching by key words, etc.
- teach children about categories and methods of organising information.

Assistive technology and access to software

Assistive technology software includes both standard and specialised programs that give children access to a range of computer and ICT resources. Many assistive technology software packages will work on a standard computer without special adaptations. However, some children will need special peripherals or add-on devices to help them access both ICT software and assistive technology software. These peripherals include

- alternative keyboards
- keyguards
- alternatives to the mouse, for example rollerball, trackerball, joystick
- concept keyboards
- touch screens
- switches.

Peripherals should be chosen to meet the holistic needs of the pupil. Children may need to try out a range of devices in situ before a final choice is made, and will also need time to train on new devices. Needs and options will change as both children and technology progress. Some of the peripherals will allow children access to the full range of standard educational software options used by their peers. Devices, such as switches will generally give access to specialised software, but expert advice and support will be necessary.

Some children may need a customised system comprising of a combination of computer peripherals and software to address their particular needs. For example, a visually impaired pupil may use a computer and a scanner equipped with optical scanner recognition software to scan text. This allows children to store, edit and use the material on the computer and output information via print, speech, or Braille as required. Closed circuit television (CCTV) is another example of a specialised assistive technology solution.

With many assistive technology devices children can use the same standard ICT software as their peers in order to support their learning. As with standard ICT software programs, they can be content-free or content-rich.

Assistive technology: content-free software

Content-free assistive technology software can take the form of complete programs, for example a customised word processor, or applications that can be used with standard programs, for example text magnification. Many children may need support in order to access the communication and writing facilities of ICT. Options include

- word prediction
- grammar prediction
- word banks
- speech output
- Braille output or input
- screen magnification
- a screen reader.

These options can be used within or alongside writing programs.

In addition to accessibility options and settings within the operating system of the computer, Windows can be altered to assist children. The control panel settings can be adjusted in a number of ways, for example to prevent repeat keystrokes, to slow mouse movements or to enlarge the pointer on screen. Other options include the use of foreground or background colour contrasts, the adjusting of font type and size, or the customising of the desktop and screen.

Another useful type of content-free software allows children to access easily stored pictures, words and phrases for use in communication and writing. The material can be used by teachers to support the development of children's concepts and skills, and to facilitate access to curricular topics. These programs allow a range of access options and can be of use both to children with learning disabilities and to children who need assistive technology. In addition, software which produces an on-screen keyboard is useful for those children who cannot use a standard keyboard.

For children who are unable to access a computer physically, voice recognition programs that are compatible with general software present further options. At present, however, such programs have not been refined to a sufficient extent to be considered suitable for multi-users in primary schools.

Assistive technology: content-rich software

There are some content-rich software programs that are designed to facilitate switch access. Most of these are suitable for younger children. These include programs which afford practice in and reinforcement of basic skills and concepts. The number of such programs available that can aid the development of literacy and numeracy, provide reference sources, or facilitate cross-curricular activities is growing. These programs, where their effectiveness is proven, can be used by all children in the classroom, as most switch programs can be used with the mouse or the standard keyboard.

Using software with a digital projector or large-screen television

Software can be used in the classroom for direct instruction. At a basic level, the computer can be used in conjunction with a digital projector or large-screen television to present materials in different subject areas. For example, a teacher might use this method to present a topic in history or science to a senior class or to explore an interactive book with an infant class. In a more sophisticated way, it is possible for the teacher to combine text, graphics, sound and video in a multimedia presentation.

Software can also be used to demonstrate concepts in class. For example, a concept in geometry can be explored with great flexibility using software such as LOGO. Samples of writing could also be presented, and the children, interacting with both the teacher and their peers, could contribute to a discussion on how the different pieces of writing might be improved.