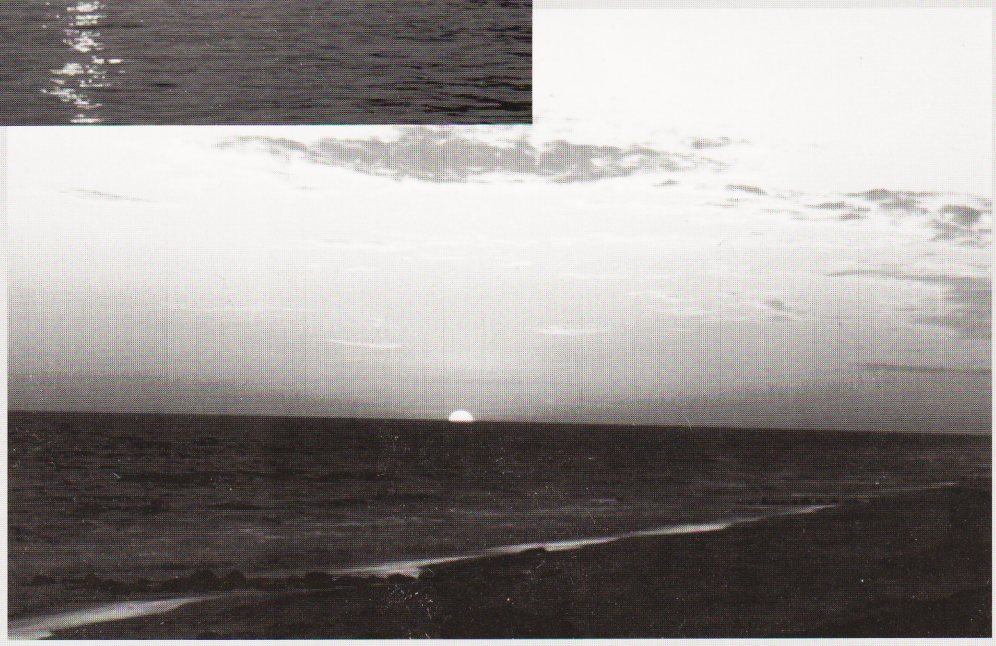
MICRO-SCOPE

Environmental Special



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NEWMAN COLLEGE with MAPE

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MICRO-SCOPE Special: IT and the environment

Integrating IT into environmental education

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Environmental education is an essential part of every pupil's education. Not a subject by itself, but a cross-curricular theme, it encompasses many different curriculum subject areas.: science, geography, history, mathematics, technology . . . and should be studied through these various curriculum areas and promoted throughout the wider aspects of school life. Studying the environment helps to encourage awareness, which in turn may lead to informed concern and active participation in resolving environmental problems.

Recently we have become more aware of air pollution, global warming, the destruction of the rainforests and the likely extinction of certain animal species, which makes us realise how fragile our planet is. There is now a great need to make young people conscious of the necessity to look after the environment and to work together to conserve and improve it. We need to help our children develop a positive approach to the environment that is around them, that is their world both now and more importantly in the future.

Pupils should develop a knowledge and understanding of the natural and built environment; of the impact of human activity on the environment; of the effect of decisions and actions and how they result in the protection or destruction of the environment; of the importance of planning and design; of environmental change and natural processes. Through environmental education children develop skills of communication and numeracy, study skills, problem-solving skills, information-handling skills and personal and social skills. They acquire positive attitudes and personal qualities of appreciation, care, concern respect and tolerance.

Curriculum activities should be planned under the following headings:

- Education about the environment
- Education for the environment
- Education through the environment

In each of these, Information Technology can act as a tool for learning and for developing vital skills. Under the headings of Communicating and Handling Information and Controlling, Monitoring and Modelling children will explore and develop their uses of IT to enhance the learning process.

Using Information Technology they will:

Communicate their ideas:
Using wordprocessors and desk top publishing programs, they will write accounts, produce posters, articles, letters. Using art and design programs they will explore the use of signs and symbols, draw designs and pictures, take photographs and display them through the computer. They will record interviews using a tape recorder, capture sounds from the environment through a microphone, communicate via e-mail to children in other towns or countries.

Example: Having visited an area of derelict land locally, the pupils take photographs, make sketches and make notes (a pocket book or laptop computer would be helpful here), making sure to observe and comment on access and the use of the immediate surrounding land. Back at school they discuss how the land might be developed. Using their photographs and the information they have gathered they use IT to produce posters and reports showing the land as it is, the present affect it has on the immediate environment, and their ideas for development. They write letters to local officials who have the authority to initiate change.

Handle information:
They will collect, collate, and process information using tools such as spreadsheets, and databases. Using carefully collected and collated data they will be able to question, predict and hypothesis, to look for patterns and relationships that will reveal trends. They will browse and search information on CD-Roms in a variety of environmental contexts allowing for discussion and conjecture.

Example: Infant pupils visit the urban farm near their school. Using a tally sheet they record how many of each species of animals they can see. The data is transferred to a simple graph drawing program. They can make sense of the graph by asking and answering appropriate questions. Re-grouping the animals e.g. according to what they eat, how many legs they have, whether they have feathers or fur etc. will lead to the production of different graphs with further interpretation.

Control and monitor:
Pupils will learn that control is integral to many every day devices, and that by writing simple instructions they can make things work. They will learn about control systems in the environment to serve different purposes and that by monitoring certain conditions we can learn more about the world in which we live.

Example: Pupils in year 6 have learned through their investigations the importance of nurturing certain plants to save them from extinction. They recognised the need for plants to be kept in carefully controlled environments. Their teacher set them the problem of devising a way that will ensure that a specific plant requiring certain given conditions, does not die. Linked with D&T lessons they build a "greenhouse" with a motorised window and a watering system. By using sensors and a control system they attempt to write a short procedure that will ensure that the conditions in the "greenhouse" are always constant.

Work with simple models:
They will explore real or imaginary situations in the form of adventures and simulations which will alert them to environmental issues in the real world. By collaborative discussion and corporate decision making they will learn more about the problems surrounding rainforest, over fishing and farming the affect man and other creatures have on the environment, the plight of some of our endangered creatures, etc. Older pupils will be able to set up their own models using spreadsheet applications in order that they can look for patterns and trends.

Example: Pupils in year 4 are exploring how animals use and adapt to the environment in which they live. In order to enhance the learning experience they are divided into groups and work through the simulation Badger Trails by Sherston software. They take on the role of a badger attempting to stay alive whilst finding its way home. Interaction with the computer and between group members allows them to make vital decisions that will affect the outcome. By empathising with the badger they are acquiring knowledge, in a stimulating way, about the badger's natural environment, feeding habits, and adaptation to life around humans. At the same time they are learning how to use their experiences to look for patterns and make predictions.

Information Technology is becoming increasingly more important in all of our lives. It is used to collect, process and present data so that we can make more sense of the world around us, to monitor aspects of the environment and to control systems designed to preserve it. It is important therefore that we foster the link between IT and environmental education as part of our school curriculum.

Environment Week at Isleworth Town School

The following chart is an example of the way one school undertakes environmental activities. Each summer Isleworth Town School holds Environment Week, a time when all curriculum activities are focused around environmental ideas and issues. IT is incorporated where appropriate.

The following ideas have also been tried and tested at the school:

- Poems and stories on various environmental themes.
- Using art packages to draw landscapes, ideal worlds, rainforests, and animals.
- Database work on local land use, traffic surveys.
- Datalogging, testing soil, air and water temperatures, day and night.
- Creating newspaper sheets taking up environmental issues – a major oil spillage, Terminal 5.

Why not make a start by following some of the ideas or choose some starting points from the list below, which could be a springboard to some purposeful curriculum work on the environment.

Environment Week at Isleworth Town School

	Reception	*Year 1*	*Year 2*
	Minibeasts: Children observe minibeasts closely. Use *Let's Draw* to draw minibeasts on the computer.	Local Area topic: Children observe their local park, discuss the Features, likes, dislikes and how they would like it changed. Using IT they design a park from their ideas	Minibeasts topic: Children collect and observe minibeasts. They write minibeast poems and stories and display in an imaginative way. Use *My World Minibeasts* (Semerc).
Year 3	*Year 4*	*Year 5*	*Year 6*
Pollution: Children explore the rainforest issue. They use *Crystal Rainforest* (Sherston).	Weather observations: recording on a database. Use *Fine Artist* to draw weather and climate pictures.	Birds in the local environment: Bird watching database (a continuing activity).	Compare two different environments: G.B. and St. Lucia. Write letters to the British Airports Authority regarding Terminal 5.

Starting points for IT activities

Communicating and Handling Information

- **Write letters** about a local issue: a dangerous traffic problem, lack of a suitable transport service, litter in the shopping centre, an additional runway at the airport.
- **Create posters** with photos and charts to get the message across.
- Write about **wider national and international issues** . . . global pollution, deforestation. Encourage others to support you.
- Send **e-mail messages**. Search the **Internet** to find groups that would be sympathetic to your concerns.
- Use your **laptops** – be a roving reporter and get people's opinions. Research the information; use a **video camcorder**; write a script and create a news broadcast as part of a drama activity.
- Conduct a **traffic survey** at different times of the day. Investigate the types and ages of cars, numbers and ages of occupants. Use a spreadsheet or a database.
- **Design a new car** for the future.
- **Weather activities**. Keep ongoing weather records. Find past weather records over a period of time. Select information and set up a database or spreadsheet to investigate trends, answering questions such as: Is the weather getting warmer? Have there been more extremes of weather lately?
- Use **weather satellite pictures** to create mock weather forecasts. Produce weather maps and charts (*My World Geography* from Semerc.)
- Take your own **photos of cloud formations**. Record what the weather was like at the time.
- **Drop a metre square** on the school field, in the 'wild' area or in the undergrowth. Use a spreadsheet or graph program, or the concept keyboard and *Concept Multimedia* to record what you find in the square.

Modelling

- **Design a board game** around environmental issues. Choose a theme.
- **Set up a model on a spreadsheet to find how much water is used** in your house in a day, a month, and a year. Use it to find ways of saving water. (You will need to know how much water you use to wash, bath, flush the toilet, etc.)

Controlling and Monitoring

- Set up **control systems** to solve problems of conserving energy.
- **Do you need blinds in the classroom**? Use two temperature sensors to monitor the temperature at the window during the hottest part of the day. Have one protected from the sun with a sheet of suitable material. Study the graphs.
- **Test the noise level in and around the school using a sound sensor**. Use the data to make comparisons between different areas.
- **How quickly does a puddle evaporate**? Monitor the temperature with a sensor. Measure the puddle at intervals. Record your findings on a spreadsheet. Compare hot and cold days.

Improving our environment: building a new school

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Margaret Still
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Back in the spring of 1994 Marlborough Primary School in Isleworth was given the go-ahead by the local council to have their present school building adapted and modernised . . . or so we thought. The plans were to knock down part of the old building, extend and renovate the present infant classrooms, remove all the mobile huts and outer buildings and build on a new block to house the juniors. Several sets of plans were viewed and discussed. Everything appeared to be going well but . . . it seemed something was not quite right. It was going to be far too expensive and could not be done for the amount originally allocated . . . why did we need a new school anyway? These were the messages that were coming to us from the local council. The authority was already committed to building two new primary schools to provide for occupants of new housing in the area. Suddenly all plans to redevelop the school were postponed.

Staff, pupils, parents and governors were devastated! How could we convince the council to give us the money to renew the school soon? What chance was there? It seemed there were too many councillors opposed to the idea. Our council member governor was doing all he could in committee and full council meetings. How were we going to win these people over? Anyone could see our building was far from adequate, large classes in small rooms, no running water in most of the classrooms etc. There was one glimmer of hope . . . the council finance meeting when they were going to finally decide provision for spending in the next financial year. We had to get our message across. We would talk to councillors, invite them to visit the school and we would lobby the council meeting. We had to present our case. . . .

That is when the IT Building Project was born. The children took photographs using a borrowed digital camera. The images were stored in the computer and used in posters, leaflets and reports to present our case. We made banners. Children, parents, staff and governors were outside the civic centre on the evening of the council meeting. A select group was outside the council chamber to explain our situation. The photographs and posters were displayed, and the leaflets handed out. The atmosphere and behaviour was very commendable. It worked. The Council voted to grant us the money, not to redevelop our present school, but to build an entirely new building on our present school field, then demolish the existing building. . . . We moved in, in February 1997.

It was decided that we needed to have a detailed record of subsequent events and we would use IT where appropriate. The children must be fully involved (indeed they had already shown they were more than able). We didn't want to miss any valuable opportunities for integrating the work into many areas of the curriculum.

It was then that the idea of presenting this work on a CD-ROM first came to us. The children had already done a lot of work with photographs and were used to using laptop computers. The previous Year 6 class had produced a *real* newspaper in conjunction the local newspaper office: innovative IT was no stranger to Marlborough School! We needed a good authoring package – the school works on Acorn computers and eventually it was decided to purchase *HyperStudio* from Tag software. This decision was taken after initial attempts using another authoring package that was not economical on memory and had a tendency to crash. The *HyperStudio* package is simple to use and deals with files and pictures economically. At first there were some features we were not too happy with: the pages did not fill the screen, but this has been rectified in later versions.

The plan was to have three main sections on the CD:

- The old school history and the present school building
- Planning for the new school
- Building the new school

Children in the then current Year 6 and subsequent Year 6 children would be involved. This will cover three different groups of children. To date we have stuck to the plan and things are progressing well. We have masses of information in various forms and to date have four interlinking

Fig. 1. *Printout from* Hyperstudio*: 'The school in 1995'.*

stacks completed. Because we are, in part, dealing with an unknown quantity (the building process is new to all concerned), it was difficult to plan any detail in advance. We planned a general structure from a front title page, but pages and routes have been planned as we've gone along and as the information has become known to us. The difficult task is selecting the information that is relevant.

The old school history

With the class teacher the children decided on the areas of history they would most like to explore and what they thought would be of interest to others when using our CD-ROM. They also discussed how they would find the information. In groups they embarked on a series of research activities to build a picture of the history of Marlborough Primary School.

The activities included:

- searching old school registers to ascertain class size, gender distribution, names of classes, teachers etc. Children used the spreadsheet *Grasshopper* to calculate totals numbers, average attendances and absences;
- examining old photographs of school teams, old pupils, teachers and events;
- using a tape recorder to interview present and retired members of staff on their memories of the school and any important events;
- collecting information from old pupils;
- examining old maps of the area to discover when the school first appeared and what was on the site before . . . apparently a pineapple farm was close by!;
- looking at plans of the original school;
- examining artefacts: trophies, awards, plaques etc., to tie down dates to events;
- taking numerous photos in and around the present school and showing children working and playing.

The children took notes and made sketches of their findings. The information that was useful and interesting for the CD-ROM was written up and saved as text files and selected photographs were scanned and saved on disc so that they could be used in *Hyperstudio*.

Last October the school had a gathering of old pupils and staff to celebrate the Diamond Jubilee and also to say farewell to the old school building. We were lucky to have previous heads including a former deputy head of the school who started as a class teacher when the school first opened. She turned out to be an ex-Commonwealth Games sprinting champion of 1938. She was given four months leave without pay to attend the Games in Sydney. Now a sprightly eighty-one year old, she came armed with photos and stories. A number of her first pupils were there and she was instantly recognised.

Before the event the present children had set up a database on *Junior Pinpoint* so we could have a record of where former pupils are now and what they are doing. It will be interesting to see what the data reveals when the children start interrogating it – all material for our CD-ROM

Planning the new school

Children were given the opportunity to discuss in groups how they would like their new school to be in terms of design and facilities. As you can imagine they had a field day!

- Some drew up their plans free-hand, others used an art/design program;
- Some then had the opportunity to create their designs in model form using 'jinks' and junk as part of D&T;
- They wrote descriptions of their ideal new school giving reasons for their choices.

When the real plans had been finalised – after weeks of intense discussion on behalf of the planners and governors, children examined the real plans and discussed their findings. For this they were fortunate to have the Mr. Smith, the building manager, to answer their many probing questions.

Photographic records were kept of :

- the removal of the old huts;
- the arrival of the machinery;
- the re-organisation of the old school;
- the digging out of the first turf to start proceedings.

(A group of children representing every class visited the site and each helped to do this)

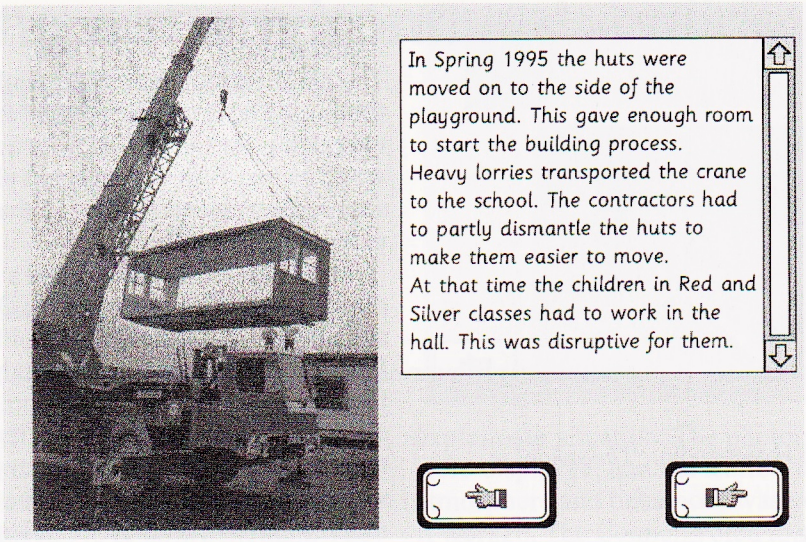


Fig. 2. *Removing the hut.*

Building the new school

Progress on the building has been recorded by the children in a number of ways

- periodically groups of children take photographs of each new stage of the development;
- there have been weekly site visits by groups of children. The children have been shown round by the site manager who has explained the processes and has answered the children's questions. The children have taken notes and made sketches. They have reported back in presentation form to their class peers and in whole school assemblies;
- children have returned to class after site visits laden with various building materials: bricks, insulation, bolts, tubing, cable etc. Photographs have been taken and descriptions written of many of these artefacts;
- the camcorder has been used to take some video shots of the new school in its various stages of development;
- the children discussed the contents of a time capsule which was buried on the site.

Fig. 3. *Site visit, with spades.*

An environmentally friendly school

When designing and building the school every effort has been made to make it cost efficient by conserving energy and economising on materials where possible, but maintaining a quality-built school. The walls, roof and flooring are insulated with layers of different types of insulation materials. The windows are double glazed and there is a computerised heating system installed to ensure that heat is conserved and maintained at an even rate and that the heating of different areas of the

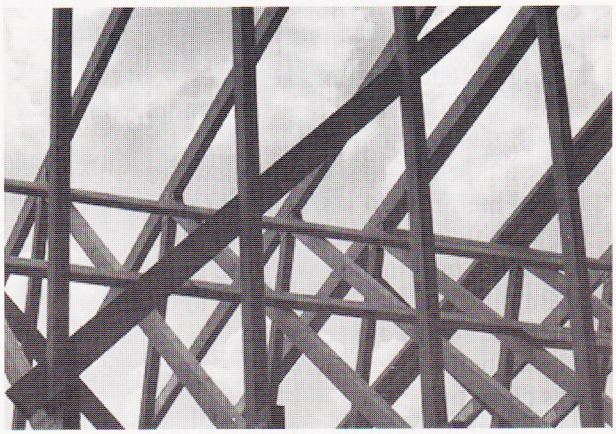


Fig. 4. *The wooden structure of the roof formed interesting triangular shapes against the sky. This is one of many photos useful for the mathematics curriculum: Pattern and shapes in the environment.*

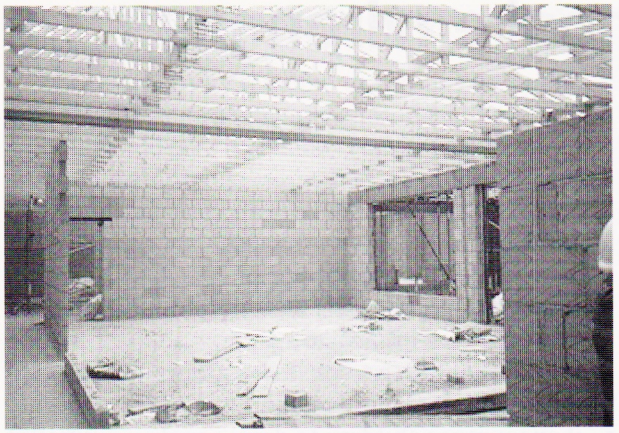


Fig. 5. *The inside of the school begins to take shape.*

school can work independently if necessary. The children have been very much involved in the debate of why such measures should be taken and this is a feature of the CD-ROM.

The new school building has many features that create a pleasant, spacious environment for the children both inside and out. Spacious resource areas shared by year group classes feature glazed group rooms, so everybody working in the area can always feel part of the whole group and not cut off from it. Each classroom has a covered way immediately outside so work can be extended outside the classroom even in inclement weather. An outside paved courtyard with raised flower beds separates the infant and junior departments.

The school has a teacher responsible for the school environment and the children are encouraged to suggest ideas for improving and maintaining a pleasant school environment. Lately this meant adapting to life next to a building site. Often ideas are brought forward through the School Council (a body of representatives from each class). The school is at present involved in an 'Industries – Link' project connected with nearby Syon Park Garden Centre. Designing and landscaping the outside areas has been the job of the designers and building

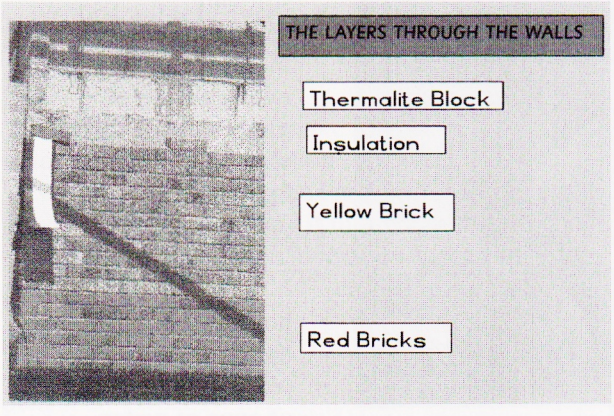


Fig. 6. *Layers through the walls.*

committee but certain areas have been set aside for children's 'patchwork' gardens. As far as possible trees on the site, particularly a huge mulberry tree and a eucalyptus tree, have been preserved. One corner of the grounds houses our recycling bins. For many years now the children in the school have organised the collection of cans and more recently paper for recycling. The project is run like a business and the use of IT has featured in this.

Making the CD-ROM

Software

HyperStudio by TAG Software: An easy-to-use authoring package that allows you to add:
Sprites:

- pictures that have been painted in a painting program or painted directly on to the card;
- photographs that been taken with an ordinary camera and processed onto Photo-CD;
- photographs that have been taken with a digital camera and processed directly into the computer;
- photographs that have been scanned into the computer's memory;

as well as:

- text, typed directly from the keyboard;
- text files;
- sound files: created by using a microphone connected to the computer or created from a pre-recording – tape, audio CD;
- movie sequences produced through movie-making software, or digitised from a video clip.

Fig. 7. *The children brought many artefacts back from the building site.*

Hardware

Acorn Risc PC multimedia computer
Epson flat bed scanner
Oak Recorder with software
Standard tape recorder
Standard camera
Camcorder
Acorn Pocket book computers

Datalogging in the school environment

Deborah Harding
Isleworth Town Primary School

Datalogging or sensing is achieved by using a sense box which can collect and store information that can then be displayed on the computer screen. The box will monitor and collect different types of information, such as light, temperature, sound and movement. It can also time events. Collecting this information is known as datalogging. Through data logging children are able to set up and monitor experiments which involve counting, timing or measurement. When the sense box is linked to the computer the information can be looked at as it is collected, this is known as collecting in 'real time'; or the information can be collected away from the computer, this is known as 'remote-logging'.

> '. . . pupils need to grow accustomed from an early age to the scientific processes of observing, measuring, describing, investigating, predicting, experimenting and explaining. Appropriate work can and should begin in infant classes. Pupils should also use their science and technological activities which pose realistic problems to be solved and involve designing and making'.
> (*Science 5–16: A Statement of Policy*)

Datalogging supports this:

- using the computer to log data enables children to carry out experiments over much greater lengths of time;
- if lengthy experiments are carried out it avoids the repetition of measuring etc.;
- it allows children to pose questions;
- it develops hypothesising;
- it encourages children to draw conclusions from their results;
- through the use of datalogging children extend their scientific vocabulary;
- children have the experience of using more sophisticated equipment and having to take care of it;
- it encourages cooperative working.

When I saw a demonstration of datalogging at a regional conference I could think of so many possibilities for using it that I ordered the equipment and software as soon as I got back to school (Sense and Control). Being the end of the summer term and like so many good ideas it all stayed in the box for months. It wasn't until we were studying physical Britain in the following spring term that I suddenly remembered 'the box'. There were some initial hitches with leads and chips and things but very soon everything was working and ready to go.

I started the children with two introductory activities. First, to get the children familiar with using the equipment, working in groups they set up the equipment by:

- connecting the box to the computer and attaching temperature sensors;
- loading and running the software;
- setting the equipment to monitor the temperature over a period of 2 minutes, starting by clicking the mouse button.

They varied the temperature of the probes by:

- holding them in their hands;
- putting them in and out of cups of water.

Fig. 1.

They were then encouraged to relate the 'story' of the graphs produced.

The next activity required the groups to set the sense box to record remotely, disconnect it from the computer and take it outside. They then put one probe in the soil, one on the surface of the soil, and one in the air. They pressed the reset button to start the recording and waited for 8 minutes. They brought the boxes back into the classroom, connected them to the computer, retrieved the data and printed out the graphs. Using a wordprocessor they wrote up what they had done and explained their results.

My observations from their first attempts were as follows:

- the children really did enjoy the activity;
- there was a high level of motivation which encouraged them to learn quickly;
- the activity certainly encouraged collaborative work;
- with encouragement the children were able to interpret the graphs, and draw conclusions;
- they did need more experience of specific scientific language;
- access to a colour printer would have made the interpretation of the graphs easier.

This was followed by a more structured activity. I divided the children into groups of four. We went into the new grounds; our conservation area – a natural area which includes a pond where children can study aspects of the natural environment. We decided to test the air and water temperatures. Our investigation was based on the following questions:

- Would the temperature be the same both in and out of the water?
- If we placed the sensors in different areas within the water or the air would we get much of a variance?
- Would any variance within the same groups (air and water) be comparable?

The following conditions were noticeable:

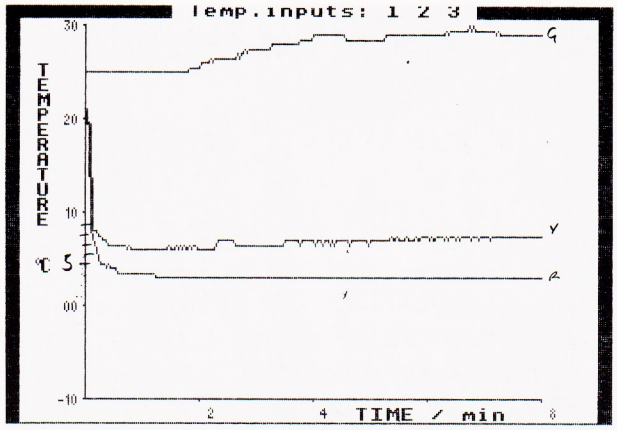
- There had not been much rain so the water level in the pond was low;
- There were a lot of tadpoles, particularly around the edge of the pond.

Would these conditions make a difference to the outcome of our investigation?

We have one sensing box and three temperature sensors. Each group took it in turns to use the equipment. For our first investigation at 11.05 we put:

Sensor 1: RED. IN THE SHADY PART OF THE POND.
Sensor 2: YELLOW. IN A SUNNY PART OF THE POND.
Sensor 3: GREEN. IN A SHADY PART *by* THE POND.

This produced Graph 1:



When we put the two sensors into the pond the temperature dropped very quickly (by 14°C in the sunny part of the pond and 18°C in the shady part of the pond), because the temperature of the pond was colder than the air temperature. We noticed that:

- the temperature of the water on the shady part of the pond stayed the same after it had dropped the 18°C.
- The temperature of the sunny part of the pond kept going up and down by 2°C. We thought that this could be because the tadpoles kept touching the sensor or it could have been because of the movement of the water either by the tadpoles or by the movement of the wind on the surface.
- The temperature in the shady part *by* the pond went up gradually and gave a 18–19°C difference between the air and water temperatures.

25 minutes later at 11.55 we set up the following investigation:

Sensor 1: RED, IN THE AIR.
Sensor 2: YELLOW, ON THE CONCRETE IN THE MIDDLE OF THE MAZE.
Sensor 3: GREEN, IN THE SHADE.

This investigation produced Graph 2:

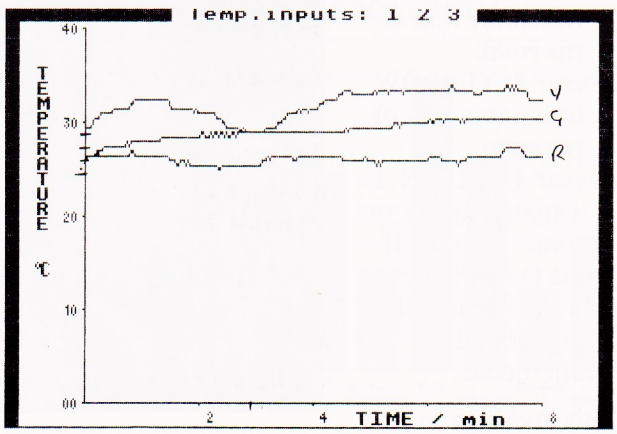


Fig. 2. *In groups children set the sense box to record remotely.*

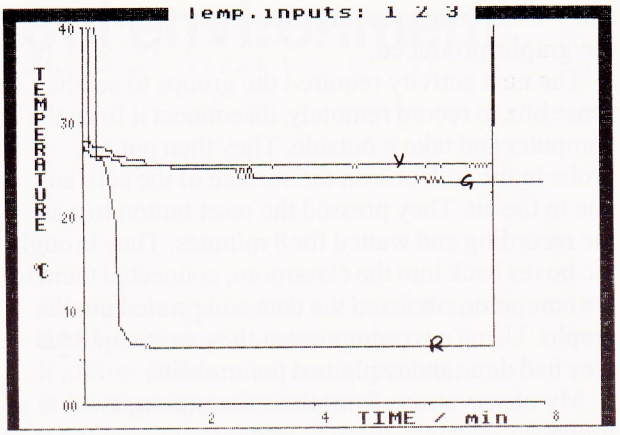
We noticed that:

- The temperatures of the air and shade were the same at the beginning but settled with the temperature in the shade being higher. This surprised us because the red sensor in the air was also in the sun. We think it might be because of the wind.
- The air temperature was the lowest; we thought it would have been the highest.
- The temperature on the concrete was the highest. We thought it would be the lowest because it felt cold when we touched it.
- The temperature on the concrete went down after about 2–3 minutes. We think that might have been because of our shadows as we walked around.

At 15.05 we repeated our first investigation:

Sensor 1: RED. IN THE SHADY PART OF THE POND.
Sensor 2: YELLOW. IN A SUNNY PART OF THE POND.
Sensor 3: GREEN. IN A SHADY PART *BY* THE POND . . . to see if the temperature was substantially higher in the afternoon.

This investigation produced Graph 3:



We noticed that:

- The temperature in the sunny part of the pond was warmer than in the shade *by* the pond. This surprised us because in the morning there was a big difference between the water and air temperatures, the water being the lowest.
- The water temperature in the shade was 20°C lower than the temperature outside the pond.
- We thought that the air temperature would be cooler because the sun was not out.

Although a structured activity, this was only a starting point within an area new to both myself and the children. We would need to do further investigations over a period of time to draw any firm conclusions. It was exciting work and the children tackled it with enthusiasm. Some of the results were certainly unexpected. The printed graphs enabled us to ponder over them to try to draw appropriate conclusions. Without datalogging equipment investigating the changes in temperature over a given time is an abstract activity. The use of the datalogging equipment makes it concrete and visual and therefore easier to understand.

Fig. 3. *Where shall we put the sensor?*

Environmental issues explored at computer club

Carole Bourne
with children from Year 6, including James Moore, Deborah Bowyer and Marc Morrison
St. Nicholas C of E Primary School, Shepperton, Middlesex

In some ways, using computers in History and Geography has become easier over the last few years. The IT curriculum has been slimmed down, while computers themselves are easier to use, break down less frequently and produce more professional results. Against this we have to set the pressure of more rigorous demands in other areas of the curriculum and the introduction of SATs at the end of Key Stages One and Two. What follows here is an account of computer use in a large primary school, of the follow up of some general work in the Year 6 curriculum and of some of the pitfalls – and excitement – of integrating IT into schemes of work and into the general life of the school.

Our school is comparatively well resourced in terms of computer hardware. We have an active and enthusiastic PTA, and have been supplied with generous donations over the years so that we now have a range of Window Boxes, RM Nimbus 486s, older Nimbus machines and BBCs, distributed as evenly as justice and practicality will allow throughout the years, from Reception to Year 6.

For the past four years, the school has run a Computer Club and it is here that we first trial software, including *Weatherwatch* and *World Development Database* materials, giving statistics on births, deaths, life expectancy, income and living standards. These two programs have been integrated into programmes of study in very different ways. We are also, at present, about to begin exploring the Internet, with two club members helping to install and explain the system to others, both children and adults.

The Computer Club includes children from Years 3–6. What they have in common is a very strong commitment to working with computers, plus, in most cases, considerable knowledge and expertise. Not all software lends itself to the type of open-ended exploration that may take place in Computer Club. While the club itself has undertaken directed research in the past, first in learning to use data handling programs and in producing a school newspaper, children are sometimes asked to evaluate new pieces of software and make their own suggestions about how they might be useful. For example, *Weatherwatch*, which includes a set of spreadsheets for recording data, really only came into its own when integrated into the planning of our Year 6 work on the Environment, when we could collect data on rainfall and temperatures on disc, generate charts and tables and send these to a link school in Imperia, Italy. Two years ago we exchanged information over a period of three months and built up some very useful comparisons between Southeast England and the Northwestern region of Italy. Since then, schools in Imperia have sent us, and other local schools, further information on CD-Rom and we hope, in due course, to be able to communicate through the Internet – time and money permitting.

However, when we began to look at world statistics two years ago, Computer Club children had some initial success. The children were already familiar with data handling and had little difficulty in loading the *World Development Database* software that ran in conjunction with *Excel*. Thereafter, we decided to explore the data to produce questions that might be answered by other children – an unusual way of going about a piece of research, but one that nonetheless produced interesting results (see example in Fig. 1). Simply by looking at a vast array of data on life expectancy, children across this age range began to form simple hypotheses about high levels of life expectancy in Western Europe compared with the rest of the world, aided of course by their existing knowledge gained from other sources such as the media. A

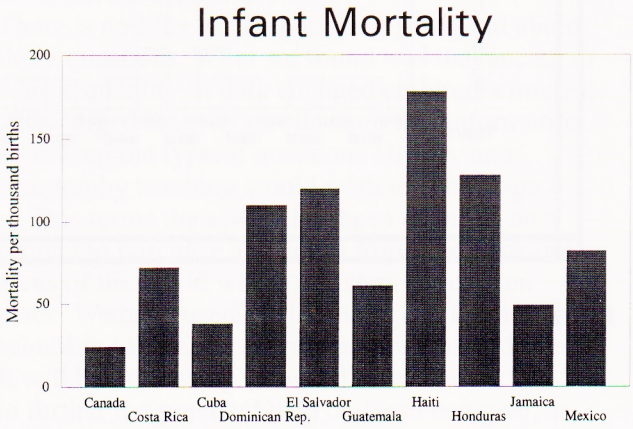
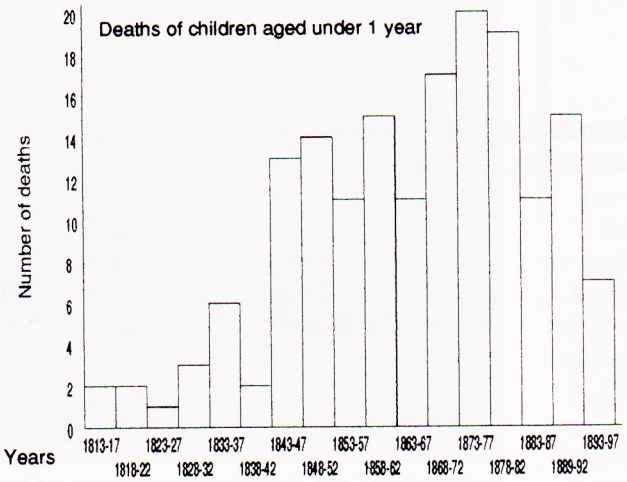
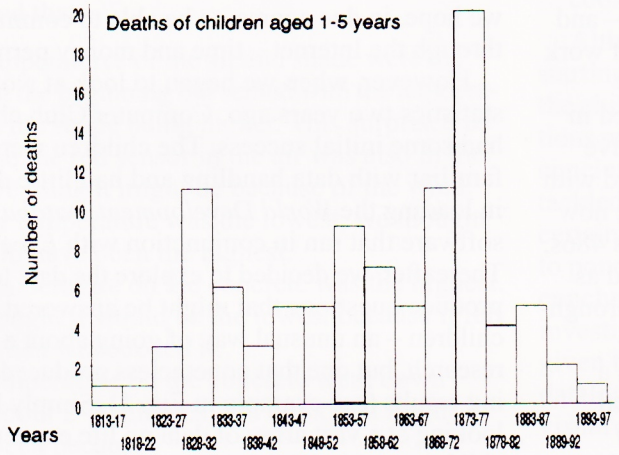


Fig. 1.

Child Deaths in the Nineteenth Century

These graphs show the number of child deaths in the village of Lydiard Millicent.





What do the graphs tell about child deaths in the nineteenth century?

Look closely at the graphs and see if you can say....

which were the worst years for child deaths.

why these years were bad years.

Make a graph showing *all* of the deaths for children under ten years old.

Does this give you a clearer picture?

Check the Facts Box

FACTS:

1842: big increase population after this date.

1852-62: bad epidemic of smallpox.

1848/1856/1879-80: very bad winters.

1848-52/1858-62/1868-77: outbreaks of disease - especially scarlet fever and diphtheria

Fig. 2.

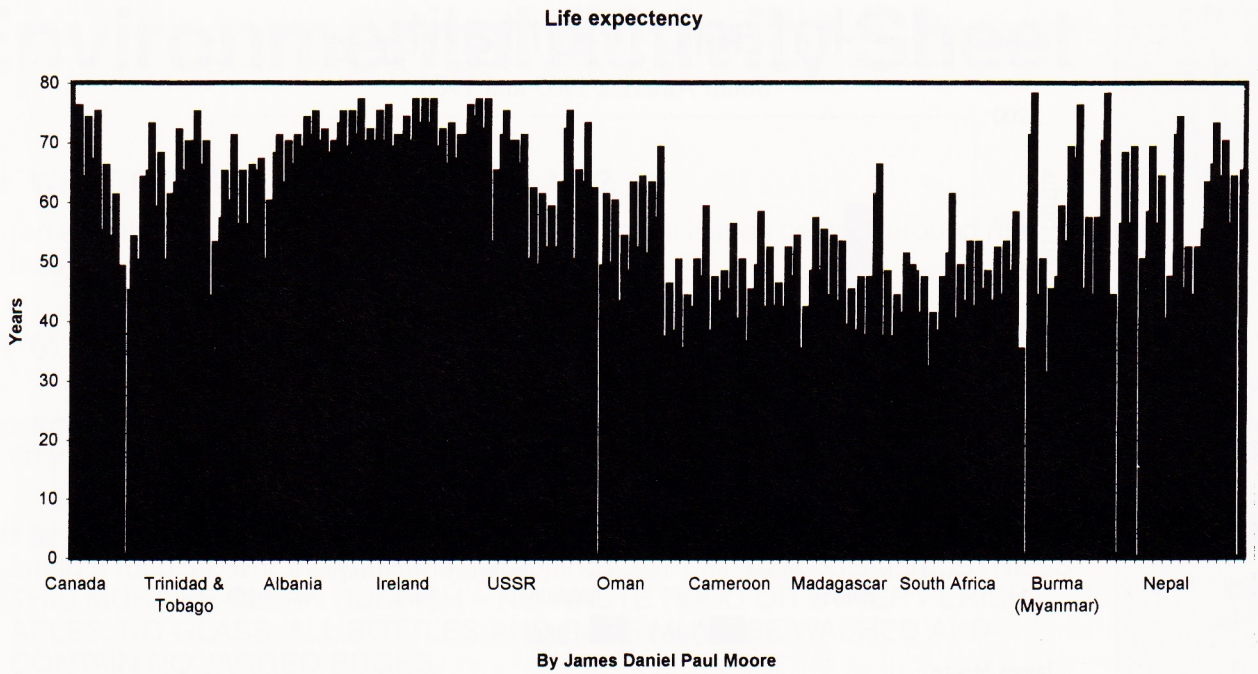


Fig. 3.

natural progression from this was to interrogate further databases and to try to discover whether any other figures might give a clue as to *why* this was so. There was also some discussion on whether, indeed, this *should* be so. Open-ended research had generated questions and discussion, besides advancing technical expertise in data handling.

Two years later, my Year 6 class is studying the Victorians in the Autumn Term. One of these children remembered his experience with *World Development Database* material in Year 4, and loaded this back on to *Excel*, in the context of some work on Child Deaths in Victorian England (see Fig. 2). What he obtained was the original forest of information which none of use could use, although children marvelled at the sheer complexity and abundance of charts and tables they could produce (see example in Fig. 3). After some questions from me, and the technical intervention of the Head teacher, we simplified the data to the point where we could produce manageable figures and ask some very interesting questions (Fig. 4). I list these below since they point up useful History research skills plus, as was the case in our earlier work, ethical questions about the effects of the distribution of the world's wealth.

1. What is our life expectancy in Britain today?
2. How does this compare with Britain in the nineteenth century?
3. Is life expectancy throughout the world significantly different?
4. If it is, why is this so?
5. Has life expectancy changed in other parts of the world over the last few decades?
6. Why might this be so?
7. What can we conclude?
8. What should we do?

There is nothing earth-shatteringly original about these questions. What we found was that access to a large quantity of data engaged children's interest and obliged them to sort through this information by asking the type of questions History and Geography teaching would wish to encourage.

This terms the school has been engaged on a project to purchase and equip Aquaboxes for use in areas of the world where disasters have taken place. We have used the link with our Italian school in Imperia to share our concerns and aims. It will be interesting to see whether we can use IT to further the practical help children can give, as well as advance their understanding.

Life expectancy for children

I created a graph to show the life expectancy of children. What I did was choose a series of countries, the countries were Ireland, Italy, Netherlands, Norway and Poland. I did a bar chart I made it that each five represented a thousand. The highest life expectancy out of the ones that I choose was Poland. The lowest life expectancy was the Netherlands. I felt that the program was relatively easy.

by Marc Morrison

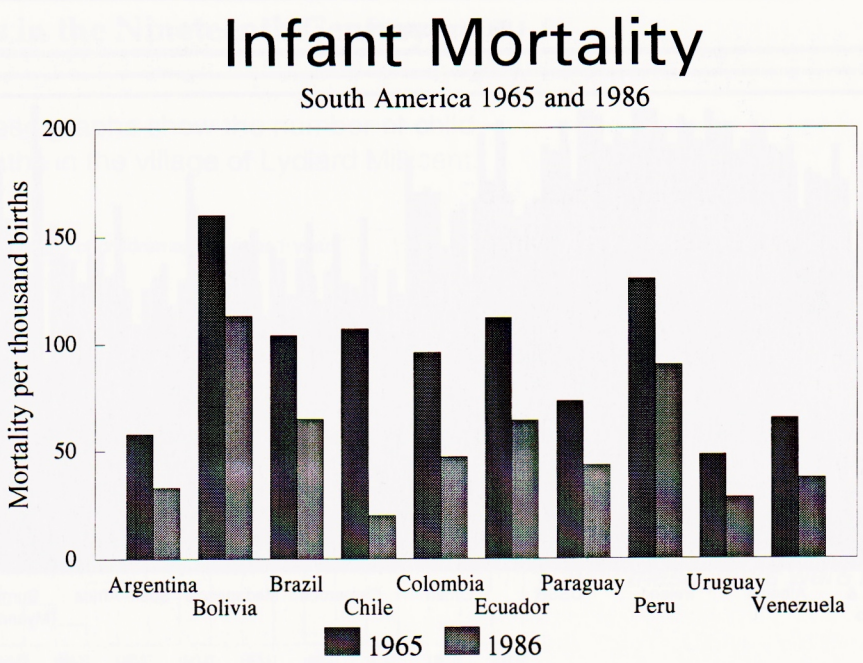


Fig. 4.

Using the computer in the environment

Many company discs are about the environment and our Earth. This includes one called World Development Database. This is a quotation from the front of the file.

'The Database Project is a resource to help students and teachers use a database in the classroom'.

Using the data provided, children can create graphs about the environment and other issues.

You can also use it for research into the environment. It is very useful for researchers who like to find out things about our earth and the environment. It can be used in the classroom as a useful source of information and data. There are two 3.5" diskettes in the pack. The pack also includes a booklet about the database and how to use it. On the front of the booklet it says the quotation above. The Development Data Book is a

'Guide to social and economic Statistics with a comprehensive data table.'

In this helpful book there are a lot of graphs and charts. One of these is a graph to show how many boys and girls die before the age of 5. In the whole graph it shows that more boys died than girls. In the low income countries the ratings were 11.4 for the boys and 10.2 for the girls. There are many other graphs like this including one about Primary schools enrolment rates.

Environmental Activity Sheet

Title: **WHAT DOES OUR RUBBISH TELL US?**

(an activity to raise awareness of the environmental issues centred around rubbish)

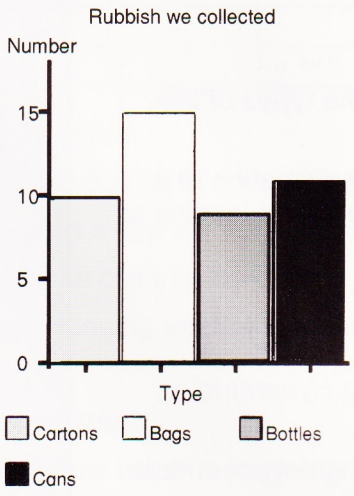
Activity: Children investigate the rubbish collected in their houses over the weekend.

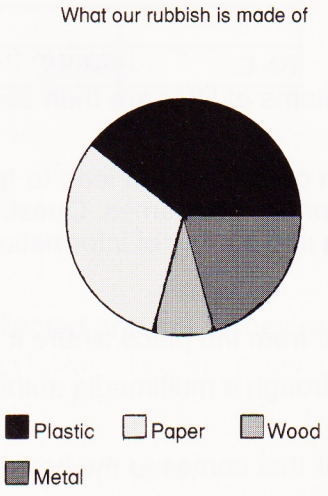
Resources: Rubbish, any graphing program which allows the creation of bar and pie charts or a spreadsheet

What to do: Each child is given a plastic rubbish sack into which they collect the family's rubbish over the weekend. (wrappings, cartons and containers) STRESS THIS MUST BE CLEAN RUBBISH – NO WASTE FOOD OR OTHER PERISHABLES. NO GLASS. ALL BOTTLES AND CANS MUST BE WASHED AND CONTAIN NO JAGGED EDGES.

In groups, children observe, describe, sort and count their rubbish, sorting on various criteria: eg. type, contents, use, material, disposable, recyclable. Using the graphing program they present their findings in graph form and analyse the results.

Sorting can then be extended by taking one group of the objects, eg cardboard items, cans or cartons and sorting, possibly taking information from the packages.





Extension activities: This activity can be a starting point to numerous activities in mathematics, science and D&T. Many environmental issues can be investigated

A database of all the different types of rubbish can be created so connections can be made, for example, between the use of the item and material used, size and contents and volume – depending on the age and abilities of the pupils.

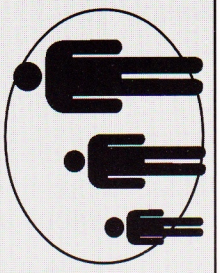
Items can be dismantled to reveal nets. Children can then use drawing programs to investigate nets.

Children can devise tests to determine the strengths of cartons and carrier bags.

IT capability: Handling Information level 2 or 3 level 4 and 5 can be achieved with more complex lines of enquiry.

IT Activity Sheet 1

Experience level
Beginner ✓
Intermediate ✓
Experienced ✓



Communicating and handling info. ✓

Controlling, monitoring and modelling

Environmental Activity Sheet

Title: **LITTER PICK**

Activity: Children investigate the litter found within the school environment.

Resources: Litter

Any graphing program which allows the creation of bar and pie charts or a spreadsheet.

What to do: In groups and wearing disposable gloves, children collect litter dropped in various areas of the school environment, inside and out.

They do a straight-forward count of litter dropped in the various locations and enter the information into a graphing program or a spreadsheet so they can make appropriate comparisons. They can then form questions:

eg. Why is more litter found in the infants playground/by the school gate?

. . . and then hypothesise. . .

eg. We think this is because parents use this area as well as children.

Litter picks can then be done at specific times of the day to prove or disprove the hypothesis.

Extension activities: The items of litter are then sorted to identify the types of litter found in each place.

The children then form questions that lead to hypothesis and the creation of a database using appropriate fieldnames. Questions can then be asked leading to higher order searching and sorting of information.

Children could also:

Trace a piece of litter from the place where it was found to its source.

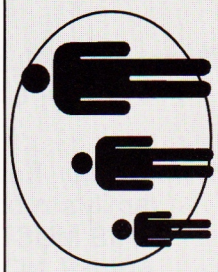
Present the 'story' through a multimedia authoring program eg *Hyperstudio, Illuminatus.*

Collect the 'junk mail' that comes to the house. Sort it using a variety of criteria.

These activities can have real value in that they could lead to a positive change in people's behaviour.

IT capability: Handling Information level 2 or 3. Level 4 and 5 can be achieved with more complex lines of enquiry.

Experience level
Beginner ✓
Intermediate ✓
Experienced ✓



Communicating and handling info. ✓

Controlling, monitoring and modelling

IT Activity Sheet 2

Environmental Activity Sheet

Title: **RAISING FUNDS BY COLLECTING ALUMINIUM CANS**

Activity: Many schools collect aluminium cans either to boost school funds or for charity. Using a spreadsheet would make the task easier and also allow predictions to be made and targets to be set.

Resources: Cans
a spreadsheet program, e.g. *Grasshopper, Starting Grid/Excel, Advantage*

What to do: Set up the spreadsheet as follows:

Collecting Alluminium Cans				
Week		**No. of Cans**	**Weight of Cans**	**Price Paid**
September	8th	160	5.12	£2.15
	15th	167	5.34	£2.24
	22nd	230	7.36	£3.09
	29th	148	4.74	£1.99
Totals		705	22.56	£9.48

This is based on:

1 can = 0.032 kg (formula: C4 * .032)

price paid = 42p per kg (formula: D4 * 42)

From this the children can:

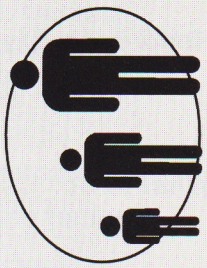
- Keep a running total of the number of cans collected and the money raised.

Extension activities:

- Predict how much money might be raised by the end of term.
- Set targets.
- Campaign for an increase in can collecting to reach targets (posters, etc.).
- Find the volume of liquid a can holds.
- Work out how much metal was used to make the can.

IT capability: Handling Information level 3. Modelling level 4/5.

Experience level
Beginner ✓
Intermediate ✓
Experienced ✓



Communicating and handling info. ✓

Controlling, monitoring and modelling ✓

IT Activity Sheet 3

Environmental Activity Sheet

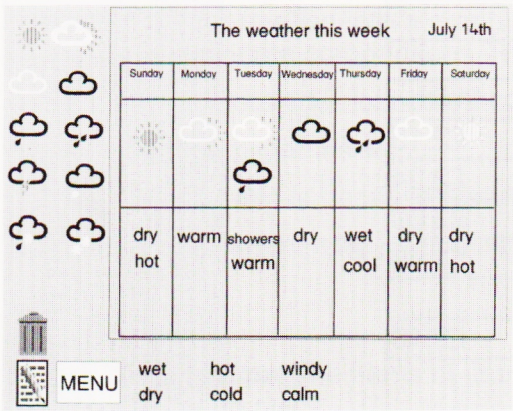
Title: **WEATHER WATCH**

Activity: (Early K.S. 1) Recording the weather every day for a week. Older children can continue for one month.

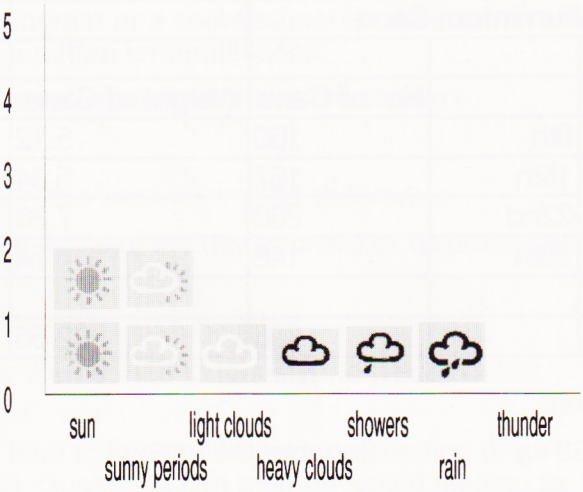
Resources: My World Key Stage 1, Geography – weather chart.

A picture graph program e.g. *Picture Point* or Counting *Pictures*.

What to do: Using the *My World* Geography activity chart, children record the weather each day in symbol and text form (1)



(1)



(2)

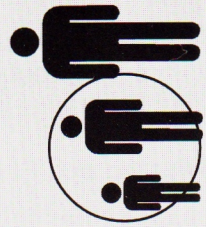
The weekly totals are entered into a graphing program e.g. *Picture Point/Counting Pictures*. (2)Together the charts will show overall what the weather was like during the week. Weekly figures can be added together to produce a monthly pictogram to show how many sunny/cloudy days etc there were throughout the month.

Extension activities: Compare the weather week by week, e.g.:

- Has it got warmer/ colder throughout the month?
- Was the beginning of the month drier than the end?
- Examine a series of weather satellite pictures: Can you predict what will happen tomorrow?

IT capability: Handling Information level 2.

Experience level
Beginner ✓
Intermediate ✓
Experienced



Communicating and handling info. ✓

Controlling, monitoring and modelling

IT Activity Sheet 4

All creatures great and small – on a database

Bob Cotter
Headteacher, Welton CE Primary School, Daventry, Northants

Welton CE Primary school lies in the rolling countryside to west of Northampton and just north of Daventry, home of the once famous BBC masts. The village school has 110 pupils and just four full-time teachers including the head. The school has developed its work in IT over the past few years and this has been greatly helped by an influx of portable computers in 1993. The work of the school often stretches out into the local area and when it was asked to be involved in the establishment and development of a 'pocket park', a local community conservation scheme run by the Northamptonshire County Council, the chance to be involved was quickly seized by the school.

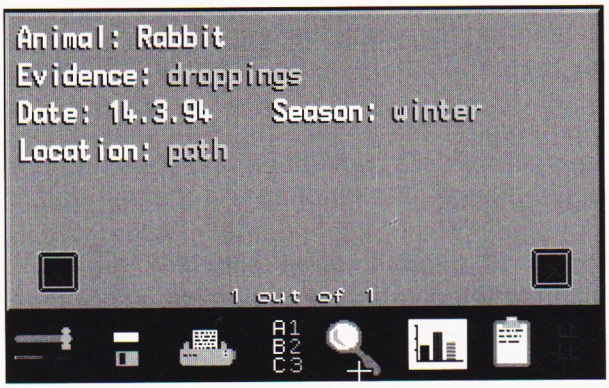
One area where the school saw a value to both the 'park' and pupils was in monitoring the wildlife that visited the park. The park is situated about 2 miles outside the village, right near another of Northamptonshire's famous landmarks, the Watford Gap Service Station on the M1 motorway. The park is situated on land that surrounds an electricity substation and was donated to Welton Parish Council by East Midlands Electricity. The site has an area of approximately one acre and initially contained areas of established woodland and meadow. As it was an area in a potentially dangerous location, the general public were neither inclined, nor encouraged, to visit the site, and as a result it became a haven for wildlife which enjoyed the relative security of a 'people-free' zone. In fact it was area ripe for study for anyone, let alone a school. It was an opportunity we did not wish to pass up.

Once the park was formally handed over to the parish in 1993 and officially opened in the September of that year, the School moved in to monitor the wildlife. We were not aware, until we started to collect information, that such a rich area for study was at our disposal. The children's first examination of the park revealed just trees and grass and on the surface it looked relatively uninteresting. Within a short space of time and through regular visits during the early months of our work, we uncovered a wide variety of evidence relating to the animals that regularly visited the park. During the Spring of 1994, we built a sizeable pond, with help from a local farmer and the local fire brigade. The fire brigade found it particularly useful for trying out their new water tender and kindly filled up the hole. This now completed the three key types of habitat, adding water to the existing woodland and meadow. The addition of the pond provided a superb area for pond life studies and each creature found is dutifully recorded and logged on the database. Other areas of the curriculum came in too . . . the making and siting of bird and bat boxes has provided an element of technology . . . and the opportunity to be involved in tree and hedge planting gave us lessons in science and conservation. There is still much to be done and no doubt the work could continue well into the next millennium.

The children were warned that they were unlikely to see many animals in the flesh, so they were encouraged to look for the 'evidence' to help them identify the creatures that visited the park. A whole range of work grew around this project, putting into real use the work they had done on 'the variety of life and living processes'. The need to store the information was obvious and the use of a database seemed the most logical means of doing this. Having a good supply of portables meant that the computers could be taken to the site and the data recorded at the park. This took away the need for countless sheets of paper and clipboards, the bane of most fieldwork. During the early months of the project, a common sight was a 'snake' of year 5/6 children, weighed down by identification charts and books and notebook computers, winding its way through the local countryside en-route to the pocket park. During the course of that year many children seemed to grow longer arms as the weight of the computers taxed their strength! Somehow the return journey always seemed more arduous, whether it was the weight of the extra data stored in the computer, we shall never know, but slowly the amount of information in the database became more and more substantial. There were times when we longed to trade our high grade Research Machines NB300 A4 notebooks into smaller palmtops or even 'pocket book' computers.

The children used a database called *Clipboard*, produced by Black Cat Software and stored on the hard disk in the RM 'Window Box' system. The database is flexible and very good for storing the sort of information we needed, offering both

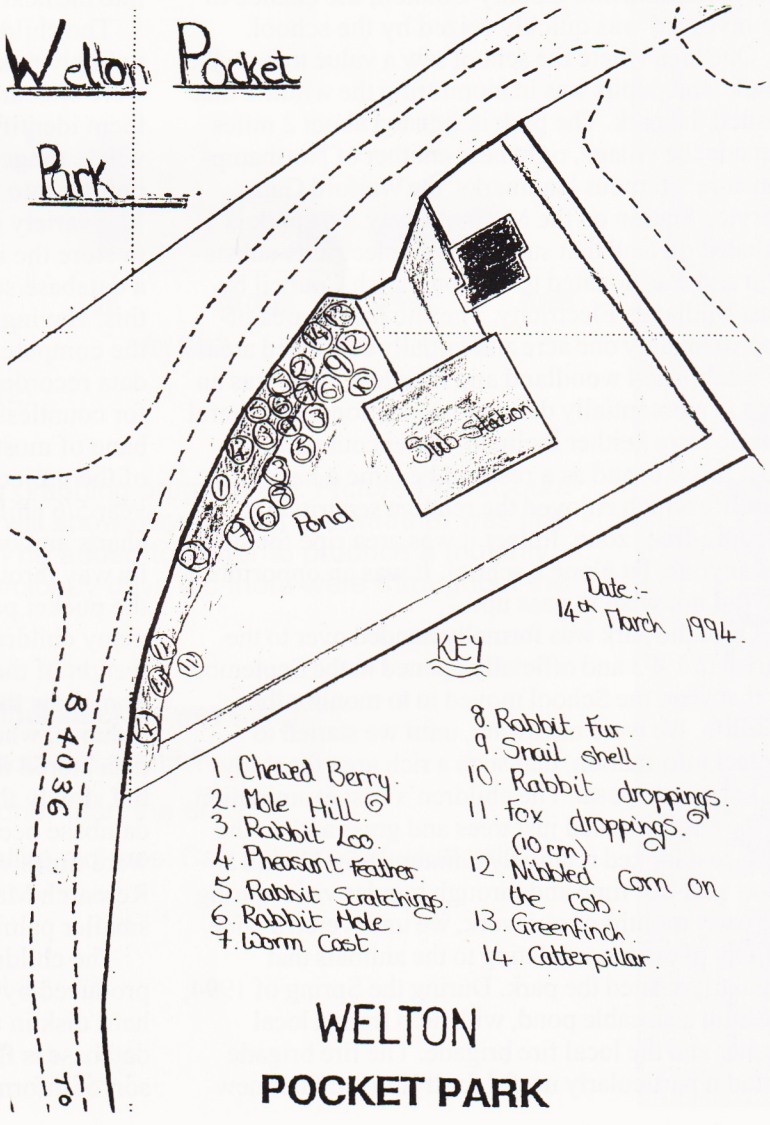
numerical and text data, along with a useful facility using 'keywords' to select the appropriate wording for the data entry.



The children worked collaboratively to construct their own fields in the database and a lot of preparatory work was carried out in classifying, sorting and analysing the type of information we needed to set up the database. Once this was done we started to collect the data. Three years later we are still collecting and have now added a variety of different wildlife to the database. Early information collected saw evidence of foxes, badgers, stoats, weasels, woodmice, grass snakes, rabbits, hares and, of course numerous birds. Little owl pellets were found and examined and the contents gave us further evidence of the likely creatures in the area. The skeletal remains of weasels and stoats were fascinating to the children and their uncovering was reminiscent of an archaeological dig rather that a environmental project. The children became experts at examining droppings (and their contents!), looking for teeth marks on nut kernels and spotting tracks and footprints. Each identified animal was recorded and the relevant details noted on the database. Details of the evidence were also noted and as the types of evidence changed, the database fields were extended. The occasional tramp enjoyed a visit too and we often found evidence of his visits!

The winter proved a very good time for this type of work as tracks and signs were easy to find. Even the fur of some hapless rabbit or the half eaten remains of a bird, gave us vital clues as to the activity in the park when no-one was around. The rare sighting of a live mammal was a highlight (with the exception of rabbits, which seemed oblivious to the presence of children), but this was occasionally tempered by the sighting of a dead animal on the adjacent road. The children were saddened when they found a dead fox one winter's morning. The frosted remains, a fresh meal for carrion birds, lay in the gutter, having been struck a fatal blow by a passing car. The fox had clearly visited our park on his travels that night and would leave us no further evidence. However, I am pleased to say other foxes have chosen to visit the park and one chose it as a final resting place; his corpse is slowly rotting to provide the children with another 'gem' to find when we next visit. One wonders if he had an inkling that he would add to the richness of the pocket park.

By the time summer comes round the park is lush with growth and evidence of finding larger mammals is scarce. The insects and birds take over and the project takes on a whole new dimension. Dragonflies now dart across the pond and lay their eggs in the water. Damselflies do likewise while their young terrorise the invertebrate life that quickly colonised



the pond. The meadows are thick with a myriad of insect life of all kinds. Scorpion flies, frog hoppers, shield bugs, worms and molluscs all form part of nature's food chain and ever-new areas for study for the children. The speckled wood butterfly is a common visitor and during the late summer they are in abundance. Frogs are now common and the occasional newt has been uncovered, hiding under a stone. Evening visits are often out of the question, but pipistrelle bats use the twilight to catch the insects for their evening meal.

Now we only take two or three computers and the information is recorded by groups and shared back at the school. The data is analysed and the habits and habitats of the creatures are written up, and the information presented in written reports, graphs and charts. As each season passes, the work is recorded and the visits are always eagerly anticipated by the children. Some children take their parents at week-ends and often will note any creatures they find when they come back to school.

As the store of information steadily increases and the children change year groups, the work remains interesting because children, as always, remain fascinated by wildlife. The need to use this store of information is a future project and although the data will continue to be collected, the opportunities are arising for putting together the findings into the information leaflets for the general public. Thoughts of a CD-ROM package for the rest of the school to share are also going through the mind. The latter idea offers a very attractive development and could prove a very worthwhile task once the work can be transferred onto an 'authoring' package.

The whole thing sounds very idyllic and it seems plain sailing. It has been hard work and the evidence is occasionally thin on the ground. The national curriculum requirements can impinge on the work and other work has to take a priority in the busy schedule of the school. Software can sometimes let you down ad portables have a habit of running out of power just when you do not have an opportunity to recharge them, even if you do have a high voltage electricity sub station within easy reach – connecting them up seems a little risky! The portables are not always easy to see in the open, especially when the sun shines brightly – and where do you keep the mouse? Then there was the time one summer when we opened the computers up at school and various insects crawled from under the keys. It put a new meaning into getting bugs in the computer. My service engineer can never work out how we need grass cleaning out of the computer casings when he services them and I dread to think what else he discovers! One thing can be sure, it leads to an interesting time and work, even on a computer database, is never dull.

Finally, our pocket park database is an on-going resource and many children contribute to it as terms roll by. You may thing we are lucky to have such a resource and perhaps we are. Most schools have access to areas where wildlife is evidence, however, you cannot always see it and you need to look carefully. You can even adapt an environment and attract the creatures to you. Build a pond, put in plants that attract butterflies and other insects, set up woodpiles and compost heaps and you'll be surprised what will come to you. What we are creating, and you can do it too, is a store of information that is fun to collect, has a relevant purpose and will be available to pupils in your school, as future resource for years to come. Go on, try it!

'That's me on the screen!'

Y5/6 children from Park Hill Primary School in Sheffield assess their environment using IT

David Owen
Sheffield Hallam University

Introduction

Assessing environmental quality and observing environmental change are popular and motivating themes for enquiry at both KS1 and KS2. This article shows how children used a mapping package to display the results of a short enquiry into the environmental quality of the immediate locality around their school.

Park Hill Primary has a striking location at the heart of Park Hill Estate in central Sheffield. The estate was built in the early 1960s and has attracted international interest for its 'streets in the sky' design.

This year it made the national news headlines as English Heritage sought to give it Listed Building status. They see it as a classic example of 1960s concrete housing and wish to preserve it. Not everyone agrees and the proposal has generated fierce debate. What would the children's enquiry reveal?

Preparing the map

The first step was to draw a map of the school and the estate. Samantha, Kingsley, Jessica and Ricky quickly mastered the mapping package and produced the base map for the enquiry (Fig. 1).

They chose to use the picture key and dragged the symbols from the border onto the map itself. They added roads and labels using the appropriate keys and discussed their own personal 'landmark' features. The 'Road', 'River' and 'Railway' buttons allow the children to draw these symbols freehand. The other buttons such as the 'School' symbol have a drag-and-drop function.

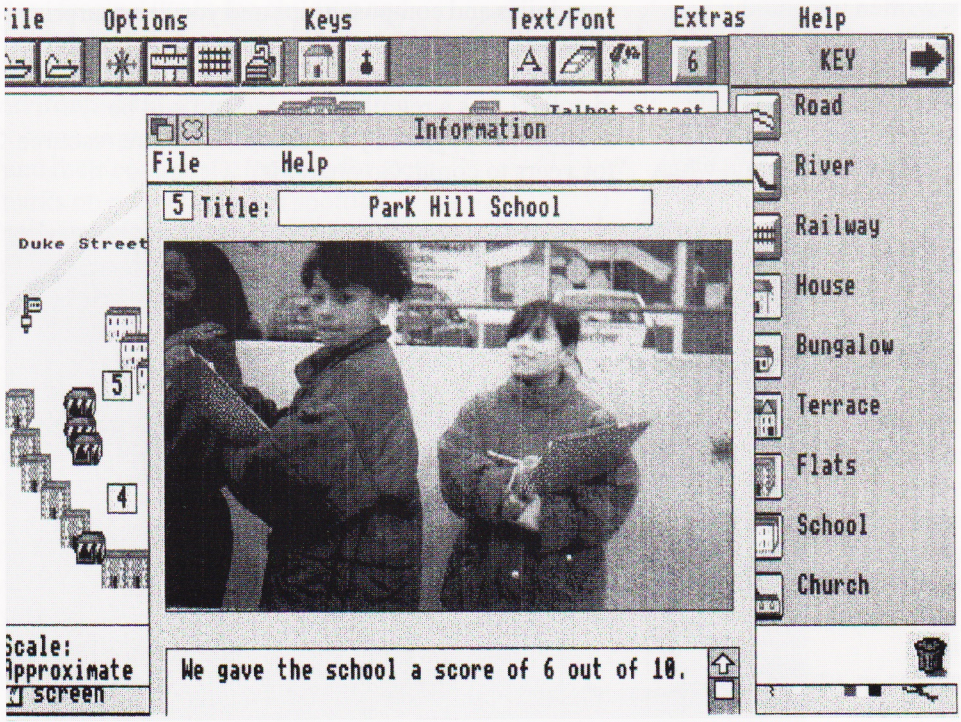


Fig. 1. *The base map for the enquiry.*

Attaching text and images to the map

Next they experimented with the 'Hotspot' function. This is the square which encloses a number 6 below the 'Extras' menu on Fig. 1. It allows a numbered square to be dragged from the border and placed next to a site which needs further explanation (Fig. 2). The user can click on this square (the hotspot) which will reveal a box into which text can be typed. The package

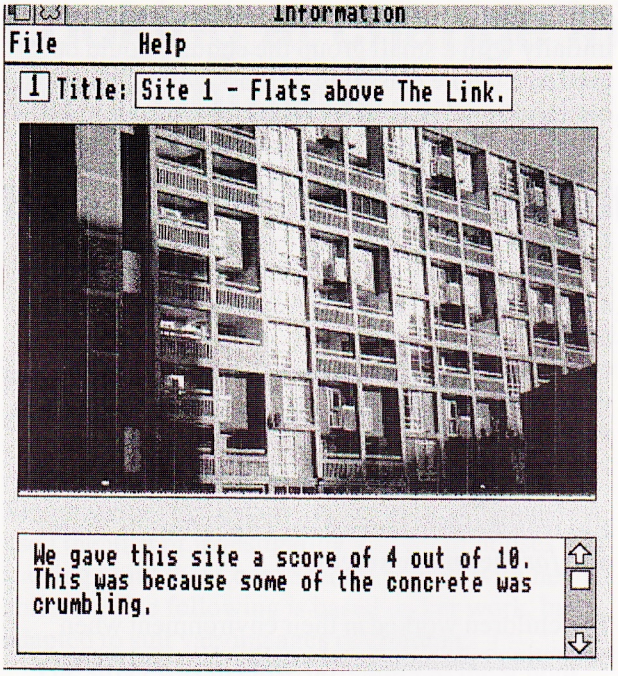


Fig. 2. *Clicking on square 1 reveals this text and image box.*

gives you the opportunity to import a scanned photograph into the box so the group planned to take suitable pictures during their field work.

Collecting environmental quality data

Equipped with an extract from an Ordnance Survey 1:10000 map, the school's camera and a table for recording environmental quality, the group headed out onto the estate. They chose to measure environmental quality at five sites. These sites were representative of the different areas at ground level on the estate and included the flats themselves, the play park, a pub and main walkway, the 'Pavement' shopping area and of course the school.

The children took it in turn to take a photograph of the sites and judged the environmental quality individually. They discussed their reaction to each scene and gave reasons for their assessments. Whilst assessing the school they proudly explained how they had saved it from closure by marching on the Town Hall with their parents!

Scanning the photographic evidence

After the fieldwork the film was developed and the photos taken to Sheffield's IT Centre at Nether Edge. It was a simple process to scan the pictures, reduce their file size and save them as 'sprite' files for the Acorn computer.

At school the group waited expectantly for the return of the photographs. Within a week they were back and the children were impressed by the quality of *most* of their pictures, now visible on the computer screen (Fig. 3). Kingsley was particularly keen on the fact that he was permanently featured on the class's computer!

Adding the environmental quality data to the map

The children set to work creating hotspots on each of the five sites. They opened the directory which held the images and dragged the appropriate picture onto the opened hotspot. This located the image at the top of the box, leaving a space for text below. Individual scores for environmental quality were entered under the correct image along with reasons for the

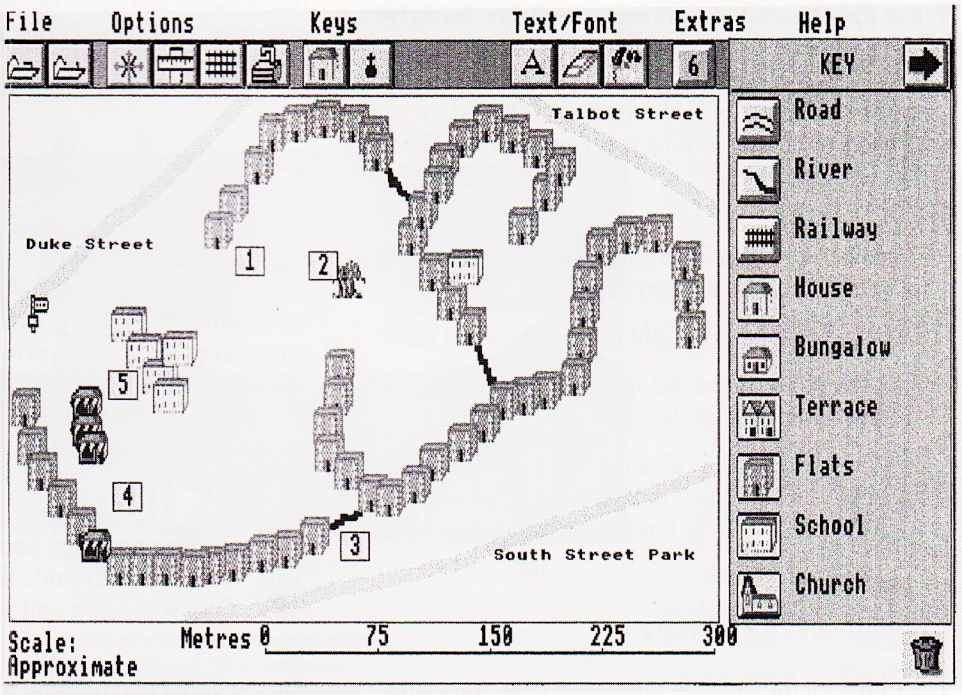


Fig. 3. *Square number 5. The children complete their assessments in front of the school.*

assessments (Fig. 3). Everyone gave the school quite a high score, and the shops also scored well.

Teaching the rest of the class how to use the package

The finished map forms a useful resource for the rest of the class and the children felt confident that they could teach their classmates how to draw up the map and create hotspots. They created a checklist of what they had learned which had the following features:

- where to find the package on the computer;
- how to draw up the map;
- how to create a hotspot;
- how to save the work created;
- how to print it out.

What did the children find out about the environmental quality?

The children identified a wide variation in the environmental quality around the school. They observed environmental improvements made over the last few years such as new play equipment, tree planting and new window frames, but also found areas on the estate where the building fabric was decaying. The children had a more positive view of the estate and its buildings than is often reported by the local media.

What did the children recommend for the future of the estate?

Opinions differed as to the future of the estate. When asked 'What would you report to the Housing Office about your survey?' Jessica thought that the best way forward was to

> 'Knock down the flats and build new houses because the flats are too old.'

However, Kingsley thought that in the short term

> '. . . the council should spend money on the flats to mend the damaged walls.'

Clearly the proposal to give the flats Listed Building status may not please all the young people who live around Park Hill if these comments are representative.

Evaluation of the enquiry

The children thoroughly enjoyed the enquiry and made meaningful assessments of their own environment. Although the mapping package was used initially with a small group the enquiry could be used in a whole class unit of work without any extra organisational problems. A number of base maps could be created by the teacher prior to the investigation for groups of different abilities. A rota for adding or creating map detail could easily be followed by groups at different times.

Although individual schools are unlikely to have a scanner connected to an Acorn system, using the Nether Edge IT Centre was found to be very convenient. Eight sprite files fitted on a double density disc and the package accepted the images very easily.

Environmental education: education *in*, *about* and *for* the environment

The children worked *in* their environment when collecting environmental quality data and were actively learning from their experiences.

They learned *about* their environment. This enquiry developed their skills, knowledge and understanding concerning the locality of their school and the concept of environmental change. Place and environment are key areas of enquiry in KS1 and KS2 Geography so this approach has considerable application in the formal curriculum.

Finally, and most importantly they learned *for* their environment. Their findings were passed to the management of the Park Hill Housing Area office. It would be naive to say that decisions would be made on the basis of their findings, but the process did have the role of developing the children's informed concern about their environment.

Conclusion

The use of a combination of painting, word processing and image handling software presents excellent opportunities for education in, for and about the environment. As the presence of multimedia computers and colour printers grows in schools, the use of mapping packages is likely to increase also. The feedback from the children suggests this is an enjoyable and useful way of developing environmental learning.

The mapping package used was *Local Studies* by Soft Teach Educational. This is available in Acorn RISC OS, Windows and Mac OS formats.

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Looking at change in the local, built environment

Houses and homes – investigating a street

From an idea by Jane Balderson
Alexandra Junior School, Hounslow

A few years back Jane Balderson of Alexandra Junior School in the London Borough of Hounslow, used the idea of investigating a street of houses as a starting point to a Local Studies project with her Y3 children. The following is based on her work, but adapted to suit varying ages of children.

The street was in close proximity to the school. The houses are arranged in two terraces: one, dated 1873 on a plaque, is slightly older than the other. Three larger semi-detached houses stand at the end. The class started by going out and looking at the houses, observing features about them, discussing similarities and differences and were encouraged to ask questions . . .

- How old are the houses?
- What date were the houses/buildings in the street built?
- How can we tell?
- Are there any clues?
- Can the features help us?
- What does the plaque say?
- Do the brick patterns help?
- What materials were used to build the houses?

Other questions were posed:

- What changes have taken place in the buildings?
- Why were the houses/buildings built here?
  – advent of railways
  – development of spa resorts
  – expansion of local industry.
- What are the buildings used for now?
- Who by?
- Why?

The children initially focused on the idea of change, examining the visual changes that had taken place over the years.

- Which house had replaced windows, doors, roofs?
- What materials were used for these newer items?
- Did this give us a clue as to when the changes took place?
- Why did people change their houses?

Jane's class put this work on a simple database, *List Explorer*, which worked through the concept keyboard. This is a BBC program and allows pupils to see the information in a visual form and also to search the database direct from the concept keyboard (Fig. 1).

Without the concept keyboard, a visual sheet could be used side by side with a conventional database file. The children use the picture to help them formulate their questions through direct observations.

Type of house.	Chimney	Type of window upstairs	Window frame upstairs.	Door	
Wall	Roof	Type of window downstairs	Window frame downstairs.		FINISH

Fig. 1. *Keyboard overlay.*

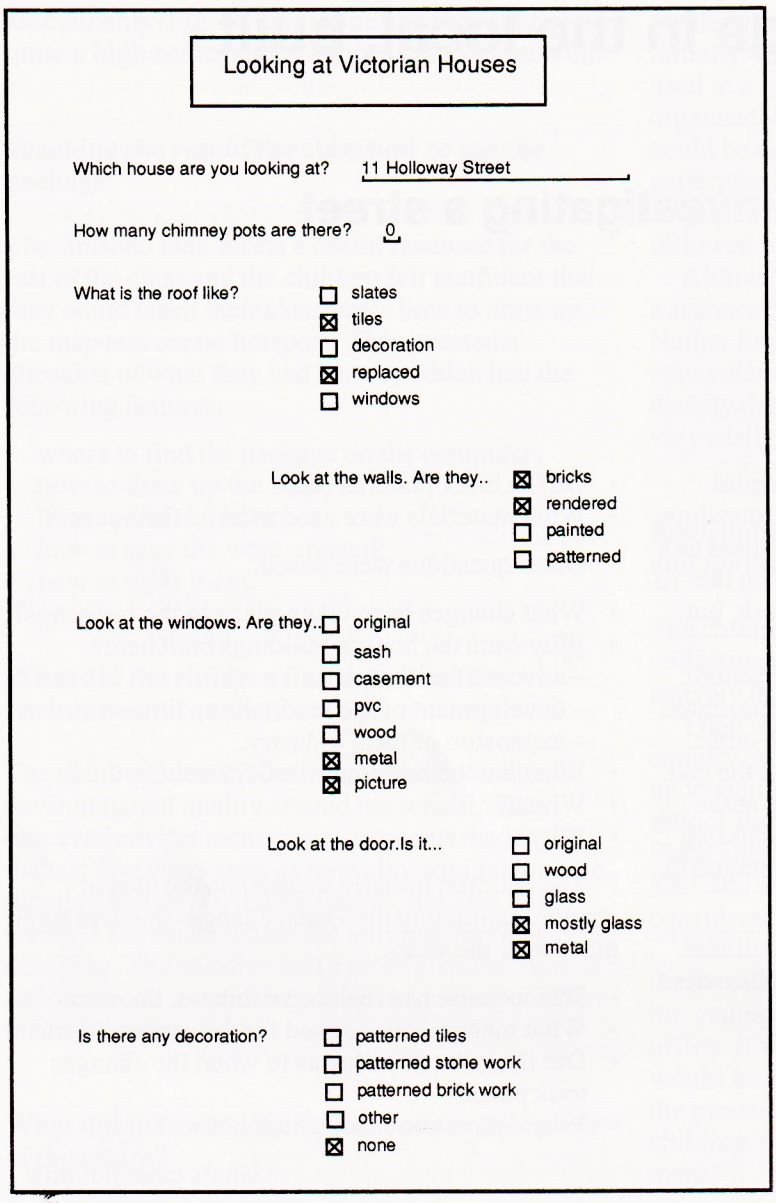


Fig. 2.

Figure 2 shows an example of a file set up on *Junior Pinpoint*. The database would allow connections to be made between the information:

- Have people changed many or single features of their houses?
- Which is the most common single feature that has been changed?
- Have the houses that have replaced windows also replaced doors?
- Might there be a reason for this?

Of course the information as it stands does not tell when the alterations were made (although the materials used might give a clue) nor whether these changes were made under the same occupancy. Such information would broaden the investigation though it might be difficult for the children to find out.

Extending the activity, information could be collected in the same way about houses in neighbouring streets. This would enable children to gain a far better knowledge of their local environment. The following questions might be considered.

- Are the same changes reflected in all the streets?
- Which age of house shows the most changed features?

Using census material

In the original study children used census materials to investigate the occupancies of the houses in 1881, soon after they were built. The information was set on a database, *List Explorer* (see Fig. 3). This led to many interesting search enquiries:

- What was the average number of people living in the houses?
- How many wage earners were there in most of the houses?
- How many people did those wages support?
- What occupations did the women have?
- How many children lived in the street?

Based on this information, various hypotheses could be formed. For the younger children, hypotheses might be suggested by the teacher, but one might expect older children to make their own connections and develop their own hypotheses from the information.

House:	11, Holloway Street
Number of occupants:	5
Name/Age Head of house:	Robert Jones; 56
Work of Head of house:	Railway ticket collector
Name/Age 2nd in house:	Mary Jones; 53
Work of 2nd in house:	Housewife
Name/Age 3rd in house:	Samuel Beckett; 25
Work of 3rd in house:	Labourer
Name/Age 4th in house:	Jane Beckett; 20
Work of 4th in house:	Housewife
School boys:	None
Schoolgirls:	None
Babies:	Mary Beckett; 1

Fig. 3. *A fictitious record.*

Investigating a street of houses can lead to many cross-curricular activities. The following table outlines some of them and suggests various IT activities.

LEARNING THROUGH OUR LOCAL BUILT ENVIRONMENT

INVESTIGATING A STREET

HISTORY	IT
When were the houses built? Look for clues- features, plaques, brick patterns, materials. Link style and plan of buildings with life patterns of the time. Why were the houses built then? – social history, advent of railways, expansion of local industry. Who lived in the houses? – investigate census returns	Write factual/fictional accounts, description of house/people who lived there; fictional diary of someone who lived in the house in Victorian times; details of the house for an estate agent Collect, sort, retrieve information; use data base e.g. observable features of the buildings or information researched on census returns. Sort and classify buildings/ artifacts found in buildings-both past and present and create a binary tree.
GEOGRAPHY	**IT**
Plans of buildings, rooms, street. Map-making in the local area. Where is the street - town or village? Has this affected the design of the houses? Land use around the buildings Investigate the services that benefit the street e.g. postman, water, electricity etc What transport and food services are there nearby? Have materials to make house been obtained locally? Pollution/ weathering on the buildings The work of an estate agent.	Draw plans of buildings.(LOGO or CAD packages) Roamer: making, using and understanding maps. create posters/ hoardings advertise local services (DTP) TE + overlay to explain and understand the local area. Simulate an estate agents office creating a database to store and retrieve information (use real information) Use a spreadsheet to investigate /compare prices of houses with dimensions, style area. Use a large database (CD ROM or other) to find up to date information on the area studied.

SCIENCE	IT
Investigating materials: durability of materials - set up fair tests. Why do people change their houses - new windows, double glazing, roofs, walls, chimneys etc. Conservation of heat, soundproofing.	Data-logging to measure certain conditions: temperature light etc - link to computer control systems to monitor temperatures. Database of materials and their properties
D&T	**IT**
Investigate machines in the modern home and how they work . Take photos of buildings. Investigate forces and structures in the buildings. Building methods past and present Make models of buildings/whole street past and/or present	List and describe electronic devices used in homes Design and make systems that can be computer controlled.
MATHS	**IT**
Look for mathematical patterns in brickwork, floors, paths, chimneys windows etc., patterns as a feature of the decor. Number and arrangement of windows, doors chimneys. Estimate the number of bricks in one wall; proportion glass/wood used in door. Space and shape. Size / area. Price/ profit etc, (estate agent simulation)	LOGO/ Tiling mosaic programs to replicate / design patterns for floors/walls. Spreadsheets to work out relative costings size and shape etc.
ART	**IT**
Use different media to make a model /picture of a house. Look at textures and patterns in houses and use them in design work.	Use design packages to create pictures and recreate patterns and textures. Use with WP packages to present ideas.

The virtual environment: exploring the environment through the Internet

There are many web-sites that allow children to find out about environmental issues, and others that give information about many creatures that live in our world. The following articles outline two projects that are currently inspiring the children who are involved.

ARKive – environmental education, endangered species and the Internet

Paul Shabajee
ARKive Research Associate
Gaynor Attwood
ARKive Education Project Manager

ARKive is an innovative project which aims to combine multimedia with Internet/communications to help children, young people and their teachers explore and learn about endangered species and the related issues. ARKive will provide Internet access (and possibly a CD-Rom) to film, pictures and sound as well as text and graphics on all endangered species as defined in the Red Data List of endangered species – some 60,000 animals. It is an initiative of the Wildscreen Trust. (You may have heard of the Wildscreen wildlife film festival awards, sometimes called the 'Green Oscars'.)

ARKive is part of a much larger millennium project (awarded millennium commission funding) called Wildscreen World, in the centre of Bristol. Other components of the 'visitor attraction' are an electronic zoo, museum of wildlife photography, 3-D Large Format cinema, education centre and nature shop.

We are fortunate in having support from the BBC, who have an extensive library attached to the Natural History Unit, and from HTV, whose Partridge Films also have an excellent collection of footage. In addition, we are working with environmental organisations such as the World Conservation Monitoring Centre, The Wildlife Trusts, World Wide Fund for Nature, RSPB and others. The education research project is funded separately by Single Regeneration Budget (SRB) funding as part of the 'Media Lab' project at the University of the West of England. There are currently four staff working on the project – Paul Shabajee (Research Associate), Gaynor Attwood (Project Manager), Richard Egan (Team Leader AV and Multimedia Centre) and Paul Gilbert (Electronic Media Production Officer).

The ARKive Education Research Project aims to make sure that this very valuable resource is as usable in schools as possible. The research project ends in March 1998. Publicly available prototypes will not be available until 1998, although development is under way and live Internet trials are already taking place.

It is refreshing and exciting that the founders of the project have chosen to start development with school use of the resource. We are working closely with two local schools, one with average IT resourcing and experience, and one which is part of the Bristol Education On Line Network, sponsored by BT and ICL. This school has three multimedia computers per class and some in shared areas. The help given by these schools has been and continues to be vital to our development.

The scope of this research is of necessity huge, and reflects our underlying philosophy that if it is to be usable in the classroom across all age and ability levels, the design process must take into account classroom realities. Some areas are:

- **What are the key *usability* issues for class teachers and teaching assistants?**
  e.g. software functionality, support materials,

classroom management, physical environment, customisation, etc. . . .

- **What are the key *usability* issues for pupils?** e.g. navigation, finding information, balance between directed learning and free exploration, mix of media, activities at and away from the computers etc. . . .
- **Where can ARKive fit into the curriculum** and particularly the National Curriculum?
- **What are the common ideas children have about endangered species** and related issues? How can we help children explore and learn about the issues most effectively?

There are many more practical questions about the future such as:

- How and when is IT and multimedia effective in **improving learning**?
- How will the **role of IT and teachers** change over the next five or so years?
- What **technological developments** can we predict or not?
- What levels of **resourcing** and **staff experience and confidence** can we assume?

We have decided to start the development by working with teachers, teaching assistants and pupils to identify how they work (and would like to work) with IT, and what makes it most and least usable. We have carried out some observations and interviews of pupils using multimedia packages related to wildlife issues. We have just completed interviews with all teaching staff in both schools and are about to start interviews with teaching assistants and pupils on both 'usability' issues and the place of ARKive in the curriculum. The analysis of the results will be of help to us as teachers, and help designers understand the requirements for effective design of educational multimedia.

Our next planned step is to set up groups of teachers, pupils, assistants, wildlife people and educational advisors, to design actual learning materials as well as to advise on the structure of the Internet site and the user interface. These are likely to include worksheets, simulation games, on-line activities, live conferencing, and much more. We will be trying different ways of working to find those which work most effectively. The support and practical assistance of the WWF, Wildlife Trusts, RSPB and others is obviously very important.

UWE BRISTOL University of the West of England

Although the technology of multimedia and the Internet has possibly considerable advantages over more traditional media as a means of exploring the issues around endangered species, we firmly believe that we should aim to complement traditional resources and only use the multimedia where it can do something more effectively than other media. For example, we can build in customisation so that we can cater for a range of abilities and learning and teaching styles.

We will also be starting from an awareness of some common 'alternative frameworks' of understanding children have about these issues. To that end we have been investigating children's ideas about endangered species. Our pilot questionnaires and interviews point to some common 'alternative frameworks', gender differences and the dramatic effect of TV and other media on children's perceptions. We will be carrying out a large-scale survey and follow-up interviews to help clarify the situation as well as comparing it to earlier research. There are clearly practical implications, e.g. it may be useful to use media personalities to get messages across.

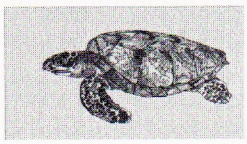
Another issue raised by our work on children's ideas has been the importance of a more balanced approach in the depiction of species in ARKive. In our pilot it is seen that children's favourite species are large mammals and their knowledge of other species is limited and often negative. In particular, ideas about plants are limited, with not a single child in the pilot (and I should also say any adult not involved in conservation) could accurately name a single endangered plant species. We feel this reflects the image gained by examining children's literature and many TV programmes, as well as the majority of the currently available CD-Roms.

It has become the belief of the Research Associate that multimedia and Internet resources have great potential to enhance environmental education, but if their promise is to be realised, a great deal of care needs to be taken in the development of resources. They must reflect the needs and realities of teachers and pupils, take into account the differences in children's (and teachers') awareness, understanding and ability, and in the case of endangered species, to raise awareness of the importance of all species and ecosystems rather than focus on those that are 'popular'.

For further information, please contact: Paul Shabajee, ARKive Research Associate, Faculty of Education, University of the West of England, Redland Campus, Redland Hill, Bristol BS6 6UZ. Tel. 0117 974 1251; Fax 0117 976 2148; e-mail p-shabajee@uwe.ac.uk

The Old Malthouse: turtles and the Internet

Moira Laffey
The Old Malthouse School, Langton Matravers, Dorset



(Hawksbill Sea Turtle)

Turtles

The Internet

What do these seemingly disparate items have to do with each other? Read on and find out.

The Internet is possibly the largest store of information on this planet and it provides easy unrestricted access to people in all corners of the earth. It can be a means of communication, finding, retrieving and providing information. Its potential for education is enormous, but have you looked at some of the stuff that is being published at the moment? Educational worksheets can be found, but quite frankly for many of these it would be cheaper and quicker to zap down to the nearest bookshop and buy a textbook.

But there is hope that this huge technology, if it does not grind to a halt under the sheer volume of traffic, may yet provide pupils and teachers with new opportunities for learning in an exciting, stimulating way which is additional to reading a book, not an alternative.

Pupils at The Old Malthouse have become involved in a project on the biology and conservation problems of sea turtles. The project has been made easily accessible, interesting and interactive via the Internet.

The Euroturtle Web Site presents valuable information in a variety of different formats and the background and history of its development can be found at the web address given below. The site has as one of its aims the promotion of environmental awareness via the Internet with a particular emphasis on education. It was within this aspect that boys at my school became involved.

They enjoyed enormously naming pictures of turtles using the identification key which the site provided, e-mailing their answers, and receiving instantly the results of their efforts. Even my marking of their prep, swift though it can be when not under pressure, is not so efficient. The site provides an adventure game involving a loggerhead turtle trying to lay her eggs on a popular Greek island visited by numerous tourists. As the turtle is faced by various hazards, speed boats, late night revellers etc., the players learn of the dangers facing this species. Questionnaires before and after the game provide feedback on how much the pupil has learned.

The site is still under development and we hope to continue to be involved, albeit in a small way, testing some of the features and helping with the odd page. It has taught my pupils a great deal about conservation and the life of the sea turtle. Yes, they could have found this information from books and journals, *but* it would have taken much longer as the data is spread far and wide, it would not have been presented in such a user-friendly way, and they would not have felt so involved in the process of their learning. In addition, they have learned how to construct web pages, not just about themselves and their school, but for a wide audience with conservation in mind.

Hopefully other groups will soon use the Internet as an interactive source of learning materials and as a research tool. The Anglia Schools on Line project has made a useful start, but there is a long way to go.

I was sceptical when OMH first went 'on line'. *I* found it useful. How else could I have read the Spanish train timetable necessary to plan my summer holidays, found an obscure poem by Rudyard Kipling which my son needed for his history lesson the next day, but was nowhere to be found in the school or county library, not to mention that fascinating stuff about horse sales in Iowa? Surfing can be fun, if expensive and time consuming, but I hope that more and more resources for learning in an interactive way will soon be available.

The EuroTurtle web site can be found at http://www.ex.ac.uk/telematics/EuroTurtle/

Anglia Education is found at http://www.anglia.co.uk/education/

A list of some useful websites

Tracking Malaysian elephants by satellite: find out about it on the *Tomorrow's World* site at:
http://www.bbc.co.uk/tw (22nd October page)
IT is helping to relocate elephants that are causing crop damage. The elephants are tagged and monitored via satellites.

Bugwatch
http://bugwatch.com/index.html
– mini-beasts galore

Underwater home pages:
http://www.pathfinder.com/@@OJfunAUA7ioH7Q3d/pathfinder/kidstuff/underwater/
http://www.underwaterworld.cvom/tour.htm
Explore the world beneath the oceans – interesting facts about the monsters of the deep.

Weather Resources at The Weather Unit:
http://faldo.atmos.vivc.edu/weather/weather.html
http://homepages.enterprises.net/jbdart/

K12 weather information:
http://web.nexor.co.uk/users/gpo/weather/weather.html

Link to weather reports and forecasts around the world:
http://weather.yahoo.com/
http://www.ran.org/ran/kids_action/index.html

Visit **Trusty the Hedgehog at the National Trust** site:
http://nteducation.org/

4Seasons:
http://www.4seasons.org.uk/content.html
Information over three areas:
Action for the environment
Department of the environment
The National Grid

Find out about frogs:
http://frog.simplenet.com/froggy/index.shtml

Friends of the Earth homepage (KS2–4)
http://www.foe.co.uk/

Link to the **Centre for Alternative Technology** (KS2–4)
http://www2.cat.org.uk/cat/
What can be done to save our environment?

Government Information Service with lots of pointers to other sites and useful contact addresses (KS2–4)
http://www.open.gov.uk/

Virtual Galapagos:
http://www.terraquest.com/galapagos/
http://www.maconnect.com/~jrpotter/kids.spml
Follows an expedition to the islands with details on the history, wildlife and photographs from the expedition.

Resources

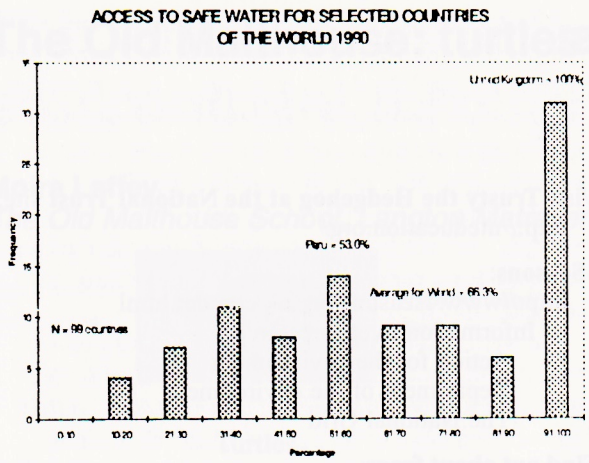
Title: **The World Development Database** (Primary)
Publisher: Worldaware Software, 31–35 Kirby Street, London EC1N 8TE
Micro: Archimedes and PC-compatible computers. Datafiles are in CSV and KEY/KEYNOTE formats.
Price: single user £32.90; site licence £58.75.

As a Governor of a large primary school in west London, I am aware of the need for teachers to integrate the use of IT across the curriculum as well as to meet the National Curriculum requirements for IT such as handling information. This is not always easy and one problem teachers face is access to up-to-date, realistic and relevant data which primary pupils can use with confidence and ease.

The school I am connected with has a well-organised environmental area complete with a large pond and class plots for the children to experiment with seeds and plant varieties. Currently they are planting several varieties of tomato to investigate their size, colour and taste. The data they collect will be analysed using IT.

The school has strong links with the wider world and has a successful link with a school in Peru. It is supporting a child through a UK charity and regularly receives letters from Peru. IT has helped the children to build up a picture of how people in other countries live and, through the Internet and software such as *Encarta*, has provided them with resources which bring immediacy to their lessons.

The school has taken out a site licence for the primary version of the *World Development Database* and uses it in the library as well as in individual classrooms and in the computer room. It was supplied with a project book prepared by Sheffield Hallam University containing many ideas for data handling in English, Geography, Mathematics and Science. There is information on 149 countries as well as statistics on issues such as life expectancy, infant mortality, population, access to clean water, energy use and carbon dioxide emissions etc. The User Handbook comes with a copiable world map plus full details on files and fields. There are also copies of the *Develop-*



ment Data Book and the *Environmental Data Book*, both produced by the World Bank.

Recent work carried out by the children has included following up an idea contained in a letter from the link school in Peru. In this, access to clean water was mentioned and this immediately aroused the children's interest.

The task was set to identify those countries having different levels of access to clean water and to compare Peru with the UK. The children were able to see that, whilst Peru was some way behind the UK and was below the world average, it was still better served than many countries.

The work raised questions about what was needed to raise standards in Peru and how long this might take and at what cost. It also led the children to investigate what problems lack of access to clean water might raise in terms of health issues and how much water each child used during a typical week. The year group are now writing back to Peru to obtain data on water use in the school and at home.

In order to let the rest of the school know what was being done and to inform visitors to the school, the children prepared a set of histograms and other graphical images portraying the data they had collected. An example of such a histogram is shown below. The situation in the UK and in Peru has been added to the graph. The display was mounted at the school entrance and has raised awareness of the school link.

Other work has centred on looking at how much energy people in different countries use and how fast the forests of the world are changing. Both sets of questions arose out of project work and were answered using the environmental data on the *World Development Database*.

The school has used the *Database* in a variety of ways. It has been used rather like an encyclopaedia to be dipped into when information is needed. The version kept in the library has been used for this purpose. It has been used to develop Mathematics skills and the versions on the class computers are ideal for this.

The new primary version of the software is certainly a database I would recommend to teachers. It is easy to use, comes in a variety of formats for use on different machines, is quickly picked up by the children and is good value for money.

Kevin Cook

Resources

AEGIS – a geographical information system supporting the geography curriculum. Allows pupils to display data they have collected on a computerised map. KS3, but successfully used at top KS2. Single User £100. PC, Acorn.

Weather Reporter – a system to enable you to continuously record the weather at your school. A robust mast with sensors, cables, power supply and software. Need not be attached to the computer to record. Runs on Acorn, Windows, PCDOS and Nimbus computers. From £395 (ex VAT).

Concept Multimedia – a new concept keyboard program that lets you explore pictures and scenes in the way that *Touch Explorer* did, but with images (including film), and sound sent to the screen as well as text. Primary site licence £95.

The above from Advisory Unit for Computers in Education.

Hyperstudio (see article on Building new School) – a sophisticated, easy to use authoring package for Apple, PC and Acorn computers. TAG Software.

SATCOM – Forest and Water Modules. Desktop access to global issues. 'Track' the earth from one of six satellites which together cover the whole of the earth's surface. Stop the satellite at 'hotspots' and access maps, images, graphs, diagrams and reports. Acorn, PC. WWF. £25–70 depending on modules chosen.

Useful CD-Roms

Animals in Danger – covers endangered species. KS2, 3, 4; PC; Multimedia Library; £24.95.

Climate Change – deals with a wide range of environmental issues. KS2, 3, 4; PC; Multimax Ltd.; £29.99.

Dangerous Creatures. KS2; Apple/PC; Microsoft; £29.99.

Explorapedia. KS2; PC; Microsoft; £29.99.

Lost Animals – details of animals that have become extinct this century. KS2; PC; Ransom Publishing; £29.99.

Garden Wildlife – a look at creatures found in the garden. KS1, 2; Acorn, Apple, PC; Anglia Multimedia; £47.00.

Habitats – photos but not much text information. KS1, 2; Acorn, Apple, PC; Educational Interactive Imaging; £47.00.

Material World – A Global Family Portrait – examines lifestyles of 30 families around the world. Apple, PC; Anglia Multimedia; £38.75.

My First Amazing World Explorer – 'delightful – well suited to early years'. KS1, 2; Dorling Kindersley; £30.

Ocean Planet – covers problems facing the world's oceans. KS2, 3, 4; Multimax Ltd.; £29.99.

Photobase Landscapes – a series of photographs from around the world – not much text. KS1, 2, 3; Longman Logotron; £61.10.

Picture base:
Farming (PC), *Settlement* (PC), *World Habitats* (Acorn). KS2, 3; AVP; £81.08 each.

Rainforests Vol. 4 – contains issues for debate. KS2, 3; Apple; PC Multimedia Library; £29.95.

Rainforest Web pack – a series of bookmarks giving access to the Internet. KS2, 3; Apple, PC; TAG; £29.32.

Renewables in View – examines aspects of energy with an emphasis on renewable resources. KS2; Apple; TAG; £58.69.

Seashore Life. KS1, 2; Acorn, Apple, PC; Anglia Multimedia; £47.00.

Sharks – high standard CD with a wealth of information about sharks. KS2, 3; PC; Multimax Ltd.; £29.99.

Violent Earth – clear and uncluttered, deals with physical geography and earth sciences including energy and weather. Upper KS2, 3; Apple, PC; Wayland Multimedia; £70.44.

World's Weather. KS2, 3; Acorn, Apple, PC; Anglia Multimedia; £58.75.

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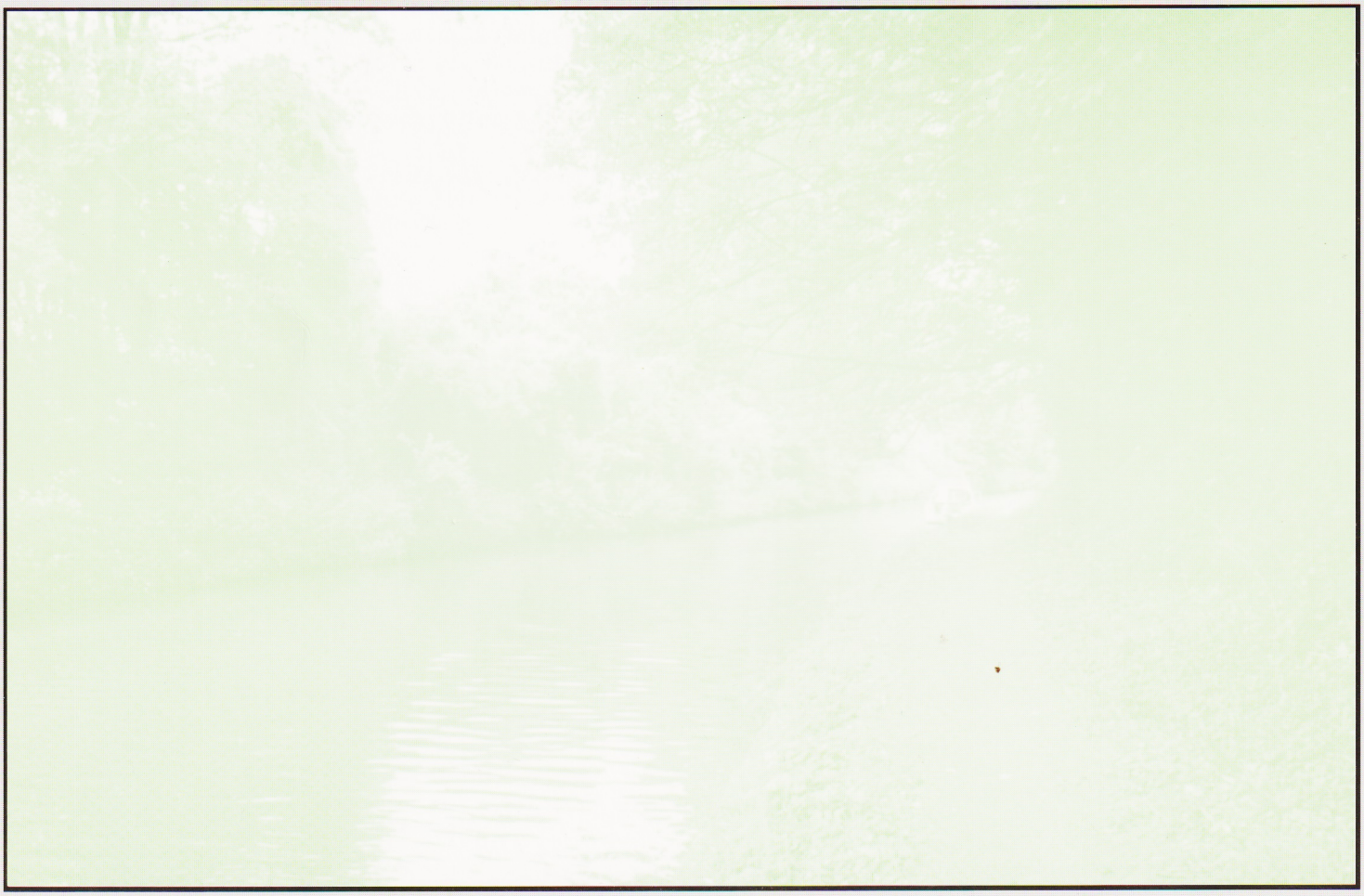

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