MICRO-SCOPE

▶ Issue 50 ▶ Autumn 1997

50

▶ 50 editions of *MICRO-SCOPE*

▶ Development of computer rooms in primary schools

▶ Activities for floor robots

NEWMAN COLLEGE with MAPE

Contents

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MICRO-SCOPE 50

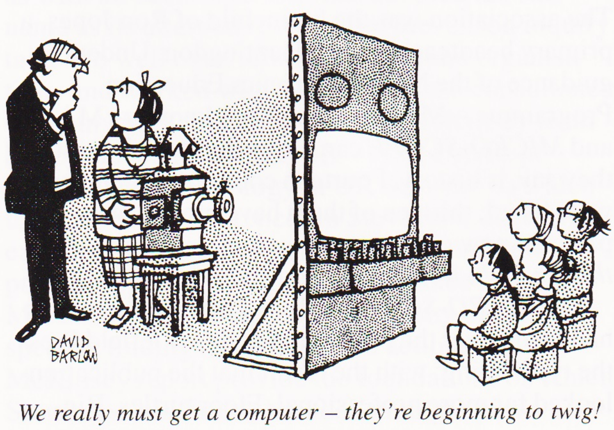
50 editions of *MICRO-SCOPE*

Roger Keeling
Newman College

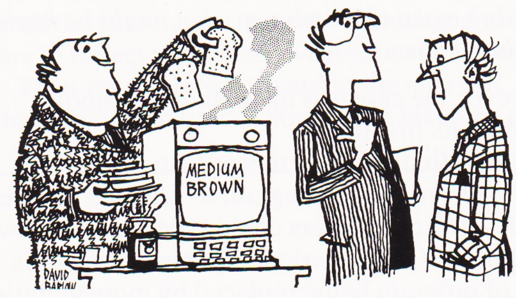
Fifty editions of *MICRO-SCOPE* is an occasion worth celebrating. Personally it is tinged with a touch of disbelief. It reminds me that I was at Newman College in 1981 putting together edition number one; moreover I am still here! I will not bore you with a synopsis of the developments that have happened in IT in the last 16 years – suffice it to say that technology has moved on apace and MAPE has tried to keep ahead of developments.

In the early part of this period MAPE's greatest achievement was as a pressure group that kept IT in primary schools on the educational agenda, a crusade that was subsequently taken up by LEAs and government. Yet although the use of IT in schools in now enshrined in the National Curriculum, the exciting changes are still to come. We are still only laying the foundations. The technology has advanced but our ability to utilise it to the full is somewhat lagging behind.

The rate of technological innovation has been much faster than originally anticipated. The specification of today's machines is astronomical compared with the early BBC micro. In fact the BBC model B micro had 32 K of internal memory, a 100 K hard disc and a 2 Mhz processor. A modern computer might have 16 megabytes of memory (512 times larger), a 1.2 gigabyte hard disc (a staggering 12,000 times larger), a 166 Mhz processor (88 times faster) and cost more or less the same price (£599 excluding monitor). Today we



We really must get a computer – they're beginning to twig!



'Old Wheatgerm can make it do anything.'

also have CD-Roms, the Internet and video conferencing with audio input on the horizon.

The extent to which technology has moved on can best be realised by going back to *MICRO-SCOPE 1*, January 1981. It was typed; word processing was not an office tool at that time, at least not at Newman! By contrast this article has been sent to the editor by e-mail! Clip art did not exist; early readers may remember David Barlow – his was the brain behind the cartoons which enlivened the pages of the early editions, a few of which I've replicated here (note that 16 years ago political correctness was not quite what it is today). As for the content? What now seems the most absurd article was entitled 'Some Hints on Hardware'. It offered advice as to what to look for when purchasing a computer. The recommended specifications included:

- 10K of available user memory
- low resolution graphics (about 80 × 60)
- a backing store to retain information when the machine is switched off, cassette recorder at least, but preferably a disc drive.

I looked to the end of the article to see who had penned these words of wisdom. The truth then dawned; it was me, how embarrassing! A further article gave an indication of pricing. The PET computer was £800 and the Apple II was £1250. In fact even today the most expensive PC we have in the Technology Centre at Newman College is a 380Z with high-resolution graphics and a colour board. When it was bought it cost us the best part of £2000 and although we haven't used it for some years now I admit to a reluctance to throw it out, so if any museum curator is reading this article, a 380Z is here for the collecting.

Another article from a deputy headteacher reported the feedback from a staff meeting held to discuss the idea of the school purchasing a computer. The comments from the staff included:

- 'Thought it was the size of an IBM mainframe – therefore movement from class to class posed difficulties';
- 'Fear of children dropping it' *(I have yet to see anyone drop an IBM mainframe);*
- 'Fear of breakdown during lessons' *(the article didn't make clear who or what might be having a breakdown).*

However, the case was made and the school acquired its first micro.

In that first issue there was also a program listing of *Trains* – a program to practice number bonds – which teachers could type into their own computers. Over a period of years we saw this type of program being replaced by more ambitious undertakings. Some of you may recall such classics as *Suburban Fox*, *Granny's Garden*, *Grass*, *Podd*, *Magic Telephone* and the *Owls Pack*. I regret that the current debate about pupil's lack of fluency in number work may lead to a revival of the *Trains* type program. What has happened to the simulations and adventure games? Has the National Curriculum constrained originality and inventiveness? In fact once we have a category of 'super teachers' we should show our faith in their ability by releasing them from the constraints of the National Curriculum.

The first editorial was written by John Lane who was at that time a member of the Maths department here at Newman College. John willingly agreed to take on the role of editor. In the first editorial he wrote:

> 'We intend to be reassuring. You won't need to be a specialist to read *MICRO-SCOPE*. We do not assume a maths degree, not programming experience, nor hardware already installed in your school. After all you don't have to be a motor mechanic to drive a car, nor an engineer to trust your life in a lift. . . . Another keynote for us is opportunity – the optimist's word for self-defence. The revolution has begun. The machines are occupying primary schools and will spread. We predict that they will transform many aspects of teaching within a decade. If classroom teachers are closely involved early enough, they can channel the energy and specify the developments they want from programmers. . . . The newsletter will be a vehicle for sharing experiences and apprehensions, flops and successes. A forum is also needed for airing the issues and choices to be faced.'

'Supply Office? Can we order a micro to fill in for the teachers out on courses learning how to use the micro?'

'We're a two-computer family.'

The fact that John focused the agenda so accurately at the outset is a tribute to all the early pioneers who were basically educationalists rather than, as they say these days, 'anoraks'. Although we have achieved a great deal, the issue of exploring the potential of IT to change styles of teaching and learning, rather than just to support current practice, is perhaps the biggest challenge of the next decade.

MICRO-SCOPE started as a Newman College initiative, but things soon changed. Tucked away on the back page of *MICRO-SCOPE 3* is a reference to 'a newly formed national association representing microcomputer users in primary schools – MAPE'. The association was the brainchild of Ron Jones, a primary headteacher from Huntingdon. Under the guidance of the Microelectronics Education Programme – MEP as it was then known – MAPE and *MICRO-SCOPE* came together and the rest, as they say, is history. Fourteen committee members were listed; thirteen of them have moved on to pastures new *(if you are one, and you are reading this, then do let us know your whereabouts).*

By *MICRO-SCOPE 6* (June 1982) Heinemanns had taken over the publishing and Castlefield Press the typesetting; with the result that the publication looked far more professional. Floor turtles, Big-

'You can wipe that silly grin off your face!'

Trak, Logo, historical census databases all featured in different articles. Looking back over this time, it has been an exciting period in which we have met many new friends who have shared our enthusiasm for the potential of IT to enhance teaching and learning. Perhaps as we get older we will look back on the 1980s as halcyon days in much the same way that my parents looked back at the 1940s, the sense of community outweighing the struggle and the difficulties.

Finally the success of any magazine is due to the drive and initiative of the editor. MAPE has been fortunate in holding on to its editors. 50 editions have been achieved with just 4 editors; John Lane, Senga Whiteman, Chris Robson and now Rhona Dick. In fact my last plea is the usual one – the editor will always be pleased to hear from you – after all the association is for the members and if we are to reflect your needs we need to hear from you. Then we can look forward to the next 50 editions; by which time I should have taken up golf!

The Stevenson report

Les Watson
Chair of MAPE

Have you noticed that IT has disappeared? As a result of the growing importance of communications technologies, IT has now become ICT (Information and Communications Technology). My first encounter with this new three-letter acronym in print was when I read 'Information and Communications Technology in UK Schools – An Independent Inquiry'. This is a report on ICT in schools commissioned by the Labour Party, before they became the government. The idea that the report is 'independent' is important, because the thinking behind the report was that, whichever political party became the government, the findings of the inquiry could provide sound general guidance on the way forward with ICT in schools. The enquiry was chaired by Dennis Stevenson, and as with all such reports, it has adopted his surname as its alternative title. The Stevenson inquiry talked to well over 100 individuals and organisations and worked with a team from the consultancy company McKinsey and Co. The McKinsey team has produced its own report – 'The Future of Information Technology in UK Schools' to which there are many references in Stevenson. However, each report has a different focus, Stevenson providing broad overarching guidance and McKinsey being more specific. Many of the specific findings and suggested actions in the McKinsey report provide the foundations on which Stevenson has built a broader strategic view.

It is some time since the publication of the Stevenson report and, hopefully, progress will have been seen with some of the recommendations. MAPE was pleased to be involved in the consultations with the Independent Commission on Information and Communications Technology (ICT) in Schools, and agrees strongly with the key conclusions and recommendations of the group. During the last 10 years (since the introduction of the National Curriculum) the profile of ICT in education has been low as schools have struggled with competing development demands. The Stevenson Report's call for a high priority for ICT and emphasis on training will produce a climate in which all schools can begin to catch up with the 'leading edge' and use ICT to produce real enhancements in learning and teaching. The support and development of teachers is the key to progress with the use of ICT in education.

The Stevenson Report is available from SRU, 78–80 St. John Street, London EC1, Tel. 0171 250 1131, and costs £10.00.

The Future of IT in UK Schools is available from Nicholas Lovegrove or Michael Wiltshire, McKinsey and Company, 1 Jermyn Street, London SW1 4UH, Tel. 0171 839 8040.

Part of this article by Les Watson originally appeared in the TES.

Information and communications technology in UK schools: an independent inquiry (The Stevenson Report)

The Independent ICT in Schools Commission 1996/97

An NCET summary

Background

Tony Blair and David Blunkett set up the commission to examine the role of ICT in UK schools. The report sets out their conclusions and recommended actions for an incoming government. However, the Commission worked independently of the Labour Party and membership was based on relevant skills, not political affiliations.

The main sources of knowledge used in the report are a 6 month study by a McKinsey & Co. team, who carried out an independent analysis of the state of ICT in schools, and an extensive evidence-gathering exercise, with contributions received from over 100 interested parties.

Aims

To produce an objective analysis of the current usage of ICT in schools, and to suggest on the basis of this analysis a desirable set of priorities for Government after the next election.

To reach the position whereby within 10 years, ICT will have permeated the entirety of education so that it is no longer a talking point, but taken for granted.

Key conclusions and recommendations

The state of ICT in our schools is primitive and not improving. This can be demonstrated by the following:

- much of the hardware in schools being technologically behind the times, with nearly 50% of desktop computers in primary schools being over 5 years old (McKinsey analysis)
- over 50 % of secondary schools having 1 computer per 10 pupils, but with a number of secondary schools and 30% of primary schools the ratio is more like 1 computer per 30 pupils.
- the experience, skills and attitudes of teachers to ICT varies widely.
- very little software is directly related to the curriculum
- the way ICT is used varies considerably.

It is a national priority to increase the use of ICT in schools. Central Government therefore needs to encourage the education sector to start using technology rather than talking about it. A Government that believes ICT is important should say so by:

- making it clear to the main national agencies and organisations in the education service (i.e. SCAA, TTA, OFSTED, NCET, SCET, examination bodies, LEAs, teacher associations, governors' organisations, etc.) that they need to cooperate in realising a strategy which is spelt out in a coherent way.

On the role of Government:

A Government should:

- announce that addressing the issue of ICT is a top priority.
- construct an overall strategy, and appoint a departmental minister to drive it.
- make national agencies key players in this strategy, and ensure that they report to Government on what steps they take to implement it.
- enable all organisations to participate in a coherent and productive way.
- encourage every school to formulate, implement and report back on its whole school ICT policies, with support from LEAs and the local community.
- sustain and give coherence to the many small and low key initiatives to be undertaken over a 5–10 year period required to achieve the long-term objective.
- This approach is preferable to one large-scale centrally-driven initiative (i.e. no 'instant fix').

On teacher support:

- aim to radically improve and accelerate the skills, experience and confidence of teachers so that they can use ICT to facilitate learning.
- set up a dedicated external network using Web sites on the Internet, and give all teachers their

own e-mail identity.

- make computers available to teachers to facilitate the learning process, through means such as income tax allowance regulation, allowing full tax breaks for teacher ownership.
- ensure that ICT competence is a requirement in initial teacher training.
- ensure that ongoing training in ICT occurs as a matter of routine.
- ensure that advisors and inspectors have appropriate levels of competency in ICT.
- carry out an independent review of the examination system to focus on the educational benefits brought about by ICT.

On software:

- aim to stimulate the development of software to ensure there is enough effective material available for school use.
- establish a network using a Web site on the Internet, allowing teachers to exchange software ideas.
- stimulate the development of the UK software industry, potentially by the establishment of a software voucher system.
- establish a national award scheme and kite marking system to help schools evaluate the standard of software.

On external networks:

- aim to ensure that all children and teachers have access to the World Wide Web and that all children over a certain age (nine is suggested) are given their own e-mail identity.
- ensure that the cost of using the Internet for schools is affordable and predictable through negotiation with the telecommunications industry.

On hardware:

- aim to ensure that an appropriate level of hardware, and access, is available to all children, while the more pressing issues of software, teacher training and network access costs are resolved.
- avoid including hardware over 5 years old in official counts.
- support smaller schools and primary schools in one-off investments in ICT, and establish a small initiatives funding agency.
- stimulate, and in some cases, part fund or match fund ground-breaking experiments in ICT.
- establish external networking in a way that ensures that the growing number of computers in the home complement those in schools.
- look at ways of offering access to children from disadvantaged families. This could include:
    - encouraging schools to widen ICT access so that facilities can be used out of school hours by the community.
    - loaning equipment to students outside school hours.
    - making community access available via computers in public libraries, encouraging cyber cafés to offer special deals for schools.

On funding:

- aim to allocate whatever amount it takes to enable the initiative to succeed, although the finance concerning teacher training, software development and external networks is not expected to be prohibitive.
- take necessary steps to encourage other sources of funding including industry sponsorship, local fund raising initiatives, community activities, and the Lottery.
- decide on what basis supplementary central funding should be made available to support initiatives (e.g. earmarked funding mechanisms such as GEST).

The full report is available from SRU, 78–80 St John Street, London EC1. Tel: 0171 250 1131. Price £10.

MAPE is grateful to NCET for permission to reproduce this summary of the Stevenson Report.

Some implications for the introduction and use of CD-Roms in primary schools

Andrea Pick
Year 4 BEd student at the University of Derby

CD-Rom is a technology that enables a large quantity of computer data to be contained on a disc similar to those used for recorded music. It is so strikingly different since, along with text, it can hold a variety of images, still, animated, photographic and cinematic as well as sound. Furthermore all of these can be 'clipped' and saved to computer disc for later use in other programs.

Although I believe CD-Roms to be an extremely valuable educational resource, it must be acknowledged that there are many teaching and learning implications to consider when introducing them into schools.

Reading levels

When considering the introduction and use of CD-Roms, schools must consider the reading age of their pupils. Inevitably a great deal of reading is necessary when searching through a database for information, and to make a useful selection from the retrieved material. Initially too this reading is on-screen, which is unfamiliar to many pupils. CD-Roms produced in America can create problems with spelling and vocabulary. Furthermore a number of discs use language which can be far too technical for primary school children.

The criteria for judging and selecting CD-Roms, therefore, should be the same as with judging and selecting books.

The nature of information

When using an encyclopaedic CD-Rom it is important to realise that children need to be aware of the different categories under which a piece of information may be held; there are significant implications for the way in which children perceive how that knowledge is organised.

Although pupils can very readily access discs and find information, they often lack the particular skills needed to search in detail for information on a topic and then to manipulate the material into the form of a report. Selecting keywords and understanding their strengths and weaknesses as a tool for retrieving relevant material is fundamental to the successful use of free text databases. Keywords can retrieve large numbers of articles, some of which may be of no relevance to the topic. I think it is necessary, therefore, to help pupils refine their searching skills by learning to select more accurate keywords, and using techniques such as combining keywords to reduce the amount of retrieved material, whilst enhancing its relevance.

Implications for planning

It must be noted that once CD-Roms have been introduced into schools, clear lines of progression involving IT and information skills, the context within which children are working, and the particular choice of CD-Rom are established. To be integrated successfully into the curriculum, the use of CD-Rom needs to be included in schemes of work to ensure adequate coverage, progression and continuity. The school development plan will need to include details of how CD-Roms will be introduced. Objectives and policies focused on pupils' needs should be set out which relate to the integration of information skills into the curriculum. Without these assessment for learning cannot be possible.

Conclusion

It can be seen that there are many teaching and learning implications which must be considered when introducing CD-Rom to a school. If all the points raised are carefully considered, then incorporating CD-Rom into the curriculum can be of tremendous educational benefit.

Where have all the Acorns gone? . . . or experiences of setting up a junior school IT room

T.G. Pearce
IT Room at Lowe's Wong Anglican/Methodist Junior School, Southwell

3200 years ago (give or take a couple of centuries), Moses wrote on some tablets of stone, giving us one of our standard sayings about unalterable precepts.

Fifteen years ago (give or take a bit less than two centuries), experience decreed that the ideal position for the BBC computer was at the back of each individual primary school classroom. Today, that is where the Acorn usually stands – loved or forgotten depending on the whims and prejudices of each teacher.

Eighteen months ago we (the staff and parents of Lowe's Wong Junior School, Southwell, Notts) swept away this educational ark, cleared out an empty classroom, fitted it out to receive all of the school's A3000s and A3020s and called it an IT Centre. And to make it work we timetabled each of our 12 classes into this room for one period every week.

While this was a curriculum-led decision, certain other pressures were playing a part. The financial pressures that released two classrooms (one for IT and one for Music) also meant larger classes, and staff were beginning to cast envious eyes on the floor space under their Acorn trolleys.

So, 18 months later, what have we learned, what have we gained, and have we lost anything?

Initial operation and lessons learned

Networks or stand-alones?

In setting up our new system of operating, we initially had to consider whether to opt for a network or to install hard discs into each of our computers. Discussions with schools who have networks told us clearly that we could never release enough staff time to support and administer a network, so the early pointers were in the direction of stand-alone computers.

We also considered printer throughput, in the light of the pleasure that children take in being able to carry something back to the classroom, not just leave it in the printer queue. We already had seven Citizen Swifts for our Acorns, so five more would allow each group of children to start printing ten minutes before the end of the lesson and still have a printout for each child to take back to the classroom. The figure for a network inkjet coping with the same throughput seemed to involve stopping another ten minutes earlier, eating a long way into the lesson time. Does anyone have any good ideas for occupying the children while the printers commit their work to paper? Yes, this is an exciting time for them, watching the results of all their efforts appear in tangible form, the noise level in the room rises, and fingers get uncomfortably near those bits of the printer which control the precision of the printing!

INSET

Introducing staff to new software has not been forgotten, and Inset days have, in part, been used for this purpose.

Software provision

The need to buy site licenses for much of our software has caused us to re-think which software we should be using. For instance, we have taken the opportunity to change our wordprocessing program from *Phases* to the more user friendly *Pendown*.

Organisation

Before the introduction of full timetabled operation, half of a term was spent with the IT co-ordinator's own class, exploring ways of using the room. The major question seemed to be 'where should the computers be situated?' With their backs to the wall (the computers that is), the teacher who has eyes in the back of his/her head (don't they all?) can see all of the monitor screens, and hence watch everyone's progress. The children, on the other hand, have their backs to the teacher, and unless well motivated can tend to presume that the teacher cannot see what they are doing. With three children per computer it is not always easy to keep everyone occupied with a meaningful activity. On balance, being able to see all of the screens has more advantages than disadvantages. One advantage is that the centre of the room is clear, so the children can sit there for a pep talk instead of having to sit on their hands at the computers. It's amazing what havoc a mouse can create if you forget this simple expedient (i.e. children sitting on their hands), to say nothing of the tears at the loss of precious work!

Management issues

During the first year (1995/96 academic year) we introduced this structured teaching of IT by concentrating on a particular piece of software each term. The second half of the autumn term was spent using *Junior PinPoint*, integrating the surveys with each year group's topic. In the spring term, *Pendown* came to the fore, playing its part in the English, History and Geography parts of the curriculum, and for writing up educational visits. Then, in the summer term, *Draw* and *Paint* were used to create pictures of the weather cycle, Viking weapons and tessellated patterns, in addition to providing illustrations for further *Pendown* activities. Also, as prompted by the curriculum, *Plantwise* and *Bodywise* were explored on a 'find out about . . .' basis. This year (1996/97) we are allowing the curriculum more say in what is done when.

Pupil involvement

We introduced a system of computer monitors, whose job it is to switch on before school, put to bed at the end of school, report failures and assist with software evaluation – control last May and spreadsheets now.

Providing for all ability levels

When not in use by whole classes, the IT room is increasingly being used by small groups. A start has been made at both stretching the more able pupils and giving the least able some extra time to build up their confidence. During the first year we noted particularly that in each class there is a hard core who always avoid loading programs, saving documents and printing. They are the ones who always go to get the sheets of paper so as to avoid using the menu button! Breaking down their fear of the unknown is a challenge.

Technical support

The author, as a parent helper, supplies assistance to those staff who need any sort of technical support. The availability of such assistance has played a part in ensuring a successful transition to this new way of working, with eight of the twelve staff needing assistance. This varied from being on hand to sort out problems, to calling the mouse clicks once the teacher has set the curriculum targets. Unjamming recalcitrant printer ribbons is the author's speciality!

What about parents?

With the children getting more access to IT, there has been an increase in the talk about IT at home. This has resulted in a partnership venture with the local College of FE, in which the author is leading groups of up to a dozen parents who are keen to learn what it is their children are doing on the computers, and in doing so pick up some IT skills themselves. This takes place during the last hour of school (Assembly between 3.00 and 3.30 pm means the IT room is little used at this time) and is followed by half an hour of family access as the children join their parents. We are also looking at the possibility of arranging similar parent sessions in the evenings to cope with a growing demand from the many who cannot come in the afternoon.

Gains

1. On average, our children are now getting five times as much IT exposure as two years ago.
2. IT is now spread much more widely across the curriculum than it was before, with word processing now representing less than 40% of our computer time, whereas it had approached twice that.

Losses

1. A few children are getting less IT exposure than they used to – but they were the acknowledged experts anyway. Ways and means of stretching them are being explored.
2. Those teachers who had a well-developed approach to IT miss the Acorn at the back of the classroom, and we hope to cater for this with our next Tesco acquisition by making one computer available within the main school building, to be booked on a short term basis by any class which needs it – provided one of our A3000s hasn't died before that computer arrives.

What of the future?

The purchase of new software is still being planned so as to extend the resource even more widely across the curriculum, with a spreadsheet and a music composition package in the pipeline. Also for the future, but building on some experiments already started, is a technique for assessing each child's IT development. We are currently exploring the use of self-assessment forms which ask the child to follow a set pattern of activities (loading, saving, adding clipart etc.) appropriate to the activities of each year group. Any adult assistance with these activities is recorded, and the time taken to complete the task is related to the quality of any resulting printed material.

Conclusion

Overall the change has been a resounding success, with all of the staff taking a very positive attitude to the new way of presenting IT, and the children look forward to their IT lesson each week with eager anticipation.

Diary of a year 6 class: using our IT room

Harriet Martin
IT Co-ordinator at Cofton Junior School

This year our school has decided to lease 15 multimedia computers for five years. A total of ten multimedia machines will live in a computer room for whole class use. Our class is very lucky; being small we can work two pupils on a computer whenever we have use of the room.

A local history presentation using multimedia

Our first project is an attempt to rise to the challenge set by Tim Brighouse, the Chief Education Officer for Birmingham: make a multimedia presentation on a local area of Birmingham for inclusion on a Birmingham disc. We take off to explore Bourneville with its history of late Victorian philanthropy living on in its present architecture. Returning to school with completed worksheets, sketches and a video, we set to work on *Illuminatus*. Children work in pairs authoring pages about the different stops on our trip, writing descriptions of the location today, and what it was like in 1840, 1880 and 1900, using old maps and pictures as sources. Four maps relating to the dates were linked with buttons to the various pages. After five sessions in the computer room (about 100 pupil hours in total) and many hours of work on my part, it was ready for compiling and publication. Unfortunately at this point it crashed – irrevocably. The automatic backup went as well as the main file. The kind man at RM offering technical support for *Illuminatus* said it was probably not our fault but these things happened sometimes. On the positive side, the children were becoming quite agile on *Illuminatus*. We have all learned lessons. Mine is always to back up *Illuminatus* even though it claims to make its own backup file.

Thus passed our first half term in the new computer room.

Reference skills in History and Geography

1. History

Several weeks into the half term we moved onto CD-Rom. We have accumulated several copies of *Encarta*, *Information Finder*, *World Book Encyclopaedia*, *Hutchinson's Encyclopaedia* and *Bookshelf*. Each of the ten computer room machines can thus be used for reference simultaneously. We started by investigating the description of London in 1880 given on Worksheet 39 of *Finding Out* (NCET Publication). Children did find out that hansom cabs existed before 1880, but that the Eiffel Tower was not built until 1889 (*World Book*). *World Book* also informed them that hot air balloons were around from 1783. Children working on the other information discs were less successful in their quests. In our following session we tried Sheet 36 'Who am I?' from the same pack. I provided the children with a list of famous Victorians (or rather famous people of the nineteenth century since not all were British). I made the list as I browsed through *Encarta* and *World Book* so I was sure that at least these sources would provide the needed information. This was generally more successful, and the class worked well for an hour on the computers with most pairs of children investigating two people quite successfully. Clearly to answer the question 'Do we know what the person looked like? Describe the person' children needed to look for pictures in their articles. Even when pictures were present they rarely used them effectively. We needed a session just describing people and objects from pictures so that they appreciate and utilise the information available from visual sources.

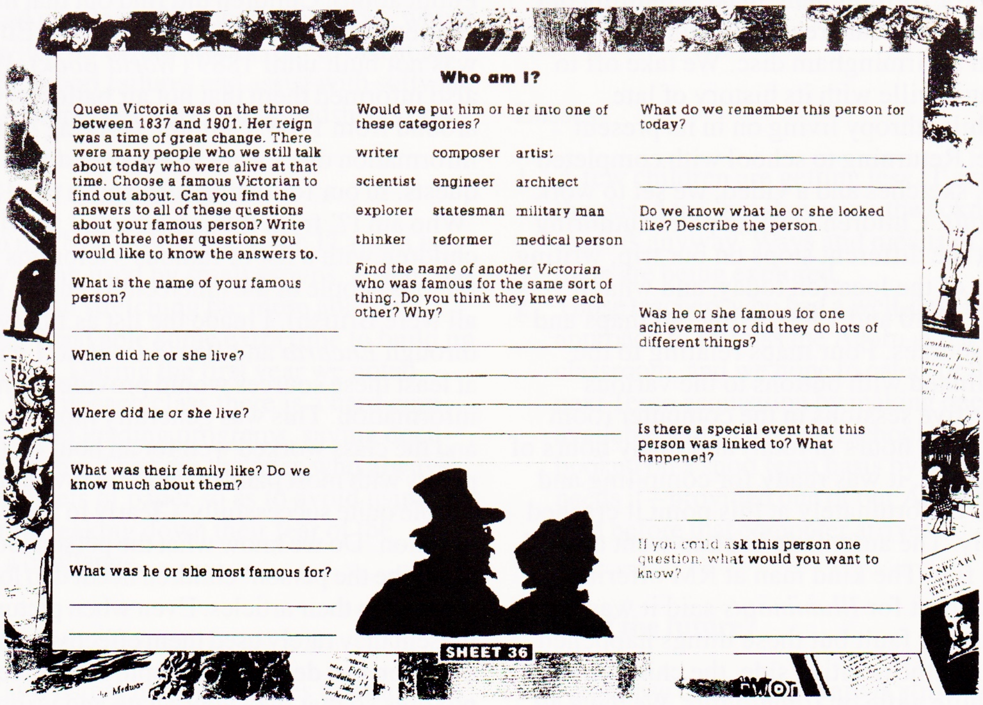
Children often did not know that someone described as a physicist or a chemist was a scientist for the purposes of the worksheet. They also had difficulty naming another Victorian whom their

Famous People of the Nineteenth Century

Choose a name and then look them up on a CD-Rom encylcopaedia. Fill in a *Who am I?*[1] worksheet about them.

	First name	*Surname*	*Researched by*	*Researched in*
1.	Alexander Graham	Bell		
2.		Daguerre		
3.	Charles	Darwin		
4.	Charles	Dickens		
5.	Sir Arthur	Conan Doyle		
6.	Thomas A.	Edison		
7.	Elizabeth	Fry		
8.	Robert	Fulton		
9.	Mrs	Gaskell		
10.	Octavia	Hill		
11.	Joseph	Lister		
12.	Guglielmo	Marconi		
13.	Ottmar	Mergenthaler		
14.	William	Morris		
15.	Florence	Nightingale		
16.	Willhelm C.	Roentgen		
17.	Dante Gabriel	Rosetti		
18.	John	Ruskin		
19.	Frank J.	Sprague		
20.	Alfred Lord	Tennyson		

[1] *Finding Out*: using reference material on CD-Rom; ISBN 1 85379 343 4; Price £9.95 from NCET.



Who am I?

Queen Victoria was on the throne between 1837 and 1901. Her reign was a time of great change. There were many people who we still talk about today who were alive at that time. Choose a famous Victorian to find out about. Can you find the answers to all of these questions about your famous person? Write down three other questions you would like to know the answers to.

What is the name of your famous person?

When did he or she live?

Where did he or she live?

What was their family like? Do we know much about them?

What was he or she most famous for?

Would we put him or her into one of these categories?

writer composer artist

scientist engineer architect

explorer statesman military man

thinker reformer medical person

Find the name of another Victorian who was famous for the same sort of thing. Do you think they knew each other? Why?

What do we remember this person for today?

Do we know what he or she looked like? Describe the person.

Was he or she famous for one achievement or did they do lots of different things?

Is there a special event that this person was linked to? What happened?

If you could ask this person one question, what would you want to know?

SHEET 36

person might have known. One child suggested that Dickens might have known Shakespeare since they were both writers. Another suggested Conan Doyle might have known Agatha Christie – in fact this is possible, as Conan Doyle was only 32 when Agatha Christie was born. A more able child noted that William Morris might have known John Ruskin.

One of the most encouraging elements of this work was that children managed, for the most part, to find at least one search engine in their reference disc and to make good use of it. They often needed to be shown a second method of finding information (e.g. searching by word or words). They needed to be reminded to search on the surname of their person when looking in alphabetical content lists. It was one hour well spent in the computer room. Only one pair of boys found it more interesting to look up guns than to discover what Robert Fulton invented. In any case they had already written a good report on Charles Dickens.

World Book (including *Information Finder*) was generally easiest to use and most helpful with its information. *Encarta* had the information and children found names well if the names were in the subject list. Searching by word was harder and here they needed help. In *Hutchinson's* there usually was a short, relevant article, but children found it easy to be led down a blind alley; their searches were not searching the entire encyclopaedia. Both groups working on *Hutchinson's* found it necessary to restart the encyclopaedia after one successful search before they could do a second. *Bookshelf* has short articles and lacked any element of excitement, but basic information was there.

The Commonwealth

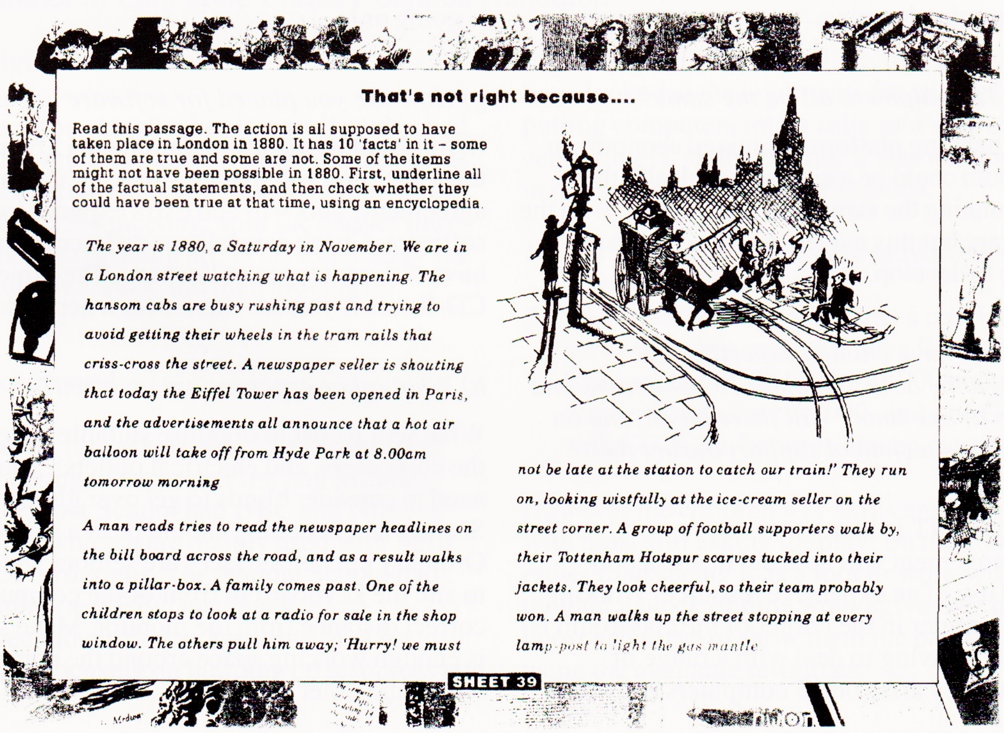
The following countries are members of the Commonwealth of Nations. Using CD-Rom encyclopaedias and atlases locate these countries on a map of the world. Colour them in.

1. Australia	2. Botswana
3. Canada	4. Sri Lanka
5. Cyprus	6. Gambia
7. Ghana	8. Guyana
9. India	10. Jamaica
11. Kenya	12. Malawi
13. Malta	14. Malaysia
15. Mauritius	16. New Zealand
17. Nigeria	18. Pakistan
19. Sierra Leone	20. Singapore
21. South Africa	22. Tanzania
23. Uganda	24. United Kingdom
25. Zambia	26. Zimbabwe

Why are these countries all part of the Commonwealth?

2. Geography

This week we follow that success with a challenge to the children to locate all the countries of the Commonwealth on the atlas sections of their encyclopaedias and to shade them in on their maps. I am giving them the names of the countries since I fear that the American discs may be less than helpful in searches on 'Commonwealth'. One boy working on the *3-D Atlas* located every country successfully. Several children found Cyprus hard to locate on *World Book* Encyclopaedias. There is a good map of Cyprus but they do not show its location in the world. If you locate the Mediterranean, Cyprus is there, but not labelled! *Encarta 95* worked well. *Hutchinson Encyclopaedia* was inclined to crash but could be successful. Children found the *Bookshelf* atlas reasonably easy to use.



That's not right because....

Read this passage. The action is all supposed to have taken place in London in 1880. It has 10 'facts' in it – some of them are true and some are not. Some of the items might not have been possible in 1880. First, underline all of the factual statements, and then check whether they could have been true at that time, using an encyclopedia.

The year is 1880, a Saturday in November. We are in a London street watching what is happening. The hansom cabs are busy rushing past and trying to avoid getting their wheels in the tram rails that criss-cross the street. A newspaper seller is shouting that today the Eiffel Tower has been opened in Paris, and the advertisements all announce that a hot air balloon will take off from Hyde Park at 8.00am tomorrow morning

A man reads tries to read the newspaper headlines on the bill board across the road, and as a result walks into a pillar-box. A family comes past. One of the children stops to look at a radio for sale in the shop window. The others pull him away; 'Hurry! we must not be late at the station to catch our train!' They run on, looking wistfully at the ice-cream seller on the street corner. A group of football supporters walk by, their Tottenham Hotspur scarves tucked into their jackets. They look cheerful, so their team probably won. A man walks up the street stopping at every lamp-post to light the gas mantle

SHEET 39

Thoughts on the development of computer rooms in primary schools

Martin Blows
Primary and IT inspector in Solihull

With more primary schools contemplating the option of dedicating one room to computer use Martin Blows offers the following points for consideration.

a) Are there enough computers for at least half of the class to use them at the same time?

The key question here is whether there is an opportunity for some direct IT teaching to occur. If there are 15+ computers, obviously all of the class can do useful IT work at the same time. However if you only have seven or eight computers, half of the class can work on the computers whilst the other half work in the same room (assuming there is enough space) either on non-computer-based IT activities, or on other work. It is important here that the other work is meaningful and will not require too much teacher attention, otherwise the computer-based work will suffer. There is a need to ensure that the activities undertaken are not merely supporting learning in a way that adds little to pupils' IT skills (for example maths drills and skills software). The activities should support the development of IT capability as well as supporting learning.

b) Will the IT equipment all be the same?

If you are changing platforms, a mixed economy in the same room could be a nightmare. Ideally they should be running the same operating system with the same software but this may take some organising and/or time to develop.

c) Do the staff have enough expertise and confidence, to be able to handle 15 computers and 30 children at one time? Will there be anyone on hand to provide technical support during the lesson?

You know what IT is like.

This arrangement will demand that teachers make good use of an expensive resource. Working with one computer in the corner of the classroom is one thing, but having to deal with a range of problems as they arise on 15 computers is a much larger problem. Staff will need considerable initial training and support.

d) Will all staff use the facility?

Are all staff committed to the arrangement? What training will they need to use it fully?

e) Who will look after this centralised resource?

In a secondary school this might well fall to a technician. Few primary schools will have this luxury. But the resource will probably get more use than a stand-alone computer and will need looking after properly. This could be helped by training of pupil monitors or parents.

f) Is there any way of demonstrating new software or skills to the whole class together; a large TV with SCART or video input?

This will help to focus attention. There seems to be an irresistible temptation (particularly with teachers on Inset) to fiddle with the computer while teaching is going on!

g) How are you placed for software licences?

If you want to use a simulation on 15 computers at the same time you may be breaking the sale agreement. This will add extra expense to some software. Check carefully as different suppliers have different types of licences. The same applies to CD-Roms if you use them over a network.

h) What other expenses are involved?

What will it cost to organise suitable benching for the computers, and electrical outlets? You may also need to consider blinds to get over glare problems. Seating and benching should be at a suitable height. Ordinary kitchen surfaces are seldom wide enough to site the keyboard in front of the computer at a correct distance from the monitor. Make sure there is enough working space around the computer for books and other materials.

i) Will there still be computers in the classroom?

Or is the intention to purchase computers for class use as well as a central resource?

j) How will the IT room be made available when not in use by teachers?

Open access, extra taught times? If it is open access who will supervise it? Will the computers be available when they are not in use for a whole class? Who will supervise children going there, parents, ancillaries, NNEB, Head?

k) Will children have any other opportunity during the week to practice their new skills . . . or follow up work started in the lesson?

How many slots will each class get?

l) Who will organise the timetable and ensure that it is fully used?

With all the resources in one place the room could be worth £60,000. This resource cannot be left unused for more than a minimum time each day.

m) Is there a scheme of work which identifies what classes will do?

With greater use more children ought to become more proficient and the expectations will mean that the scheme will need to be reviewed and revised regularly.

n) Will the change be permanent?

Will the room be available long term, or will pressure or rising numbers make it needed for a class in the near or longer term future?

o) Will the room be used for anything else?

How much space will this need, or how much will it limit the room. Are the activities mutually compatible? (e.g. cooking/water activities in the same room).

p) What about printers?

Will you need to consider a networking arrangement which enables printers to be shared, or class access (with a suitable phone line) to the Internet? If so who will manage it?

IT's time for a change

Elizabeth Furness
IT co-ordinator at Park Lane Primary School, Nuneaton

Whose bright idea was this?

Well it was mine actually, but it wasn't such a bad one, just a bit mind boggling. I knew other schools had specialist afternoons and proposed something similar in our Y3/4 meeting: split the classes into three mixed groups doing art, IT or technology for three sessions in a week and then moving on.

School background

We are a newly formed primary school resulting from the merging of separate First and Middle schools. The First School had BBC and Nimbus 186 machines which were mainly used with 'drill and practice' programs. The Middle School had Acorn, Nimbus and BBC machines.

IT has been identified as a priority area for development, focusing on building up resources and increasing the level of skills across the age range. I have looked at the arguments for and against putting computers into a suite as a way of concentrating IT skills, but felt it was not appropriate in our school for two main reasons:

1. It is semi open plan where movement of computers is possible.
2. We are still working towards a consistency of hardware. (We currently have five BBCs, four Nimbus, two A4000s, an A5000 and our newest acquisitions – four A7000, and one Compaq PC with CD-Rom, between eleven classes).

However the children's IT skills are quite low level with most still asking to 'play' on the computer rather than seeing it as a tool to work with so I thought a block of time would give the children a boost and serve to show them the possibilities, using the available resources.

Objectives

I decided the objectives of the three sessions would be to improve saving and editing skills, develop basic information retrieval skills and allow the children to experience the possibilities of integrating text and graphics. Looking at this together with the logistical problems of different machines, I decided to produce a newspaper reflecting our current topic, Ancient Egypt.

Logistics

As a staff we had agreed to be flexible in the use of machines, but was I being too optimistic in hoping for eight computers, preferably including the four newer machines? Fortunately my colleagues were very accommodating and so I organized a group of children to wheel the trolleys along to my classroom as necessary.

The teaching group

The group consisted of 24 Year 3/4 children. They were split into six mixed ability groups which gave some flexibility in the use of eight machines.

First session

At the first session we spent some time talking about newspapers; their content, layout and the types of stories we might have. We then gathered around the A7000 (two rows of chairs, one row of tables and 24 children) where I ran through the menu, opening *Textease* and saving onto disc. Next I showed them the SEMERC *Treasure Chest, Micropaedia* and *Ancient Lands* CD-Roms where they could find graphics/information. There were also topic books available in the classroom. I left four groups on these machines and took two groups to look at *Junior Impression* using the Newspaper format and *Front Page Extra*.

Hands on

Now for the crunch. 24 children on eight computers. Would they cope? Would *I* cope?! The children loved it and rather than 'oh no, help!', it was 'come and look at this'. There were three groups looking at CD-Roms, printing images or text and saving; two groups writing news stories using *Junior Impression* on A4000s and one group constructing the front page using *Front Page Extra* on a Nimbus. After half an hour I said everyone should save what they had done so far which led to a small hiatus but no major disasters. I was kept very busy as the children explored the possibilities and asked how to do things and I gave silent thanks that I had formatted several discs as they saved this and that.

The children moved to different machines depending on their needs. For example: 'we want to find a picture of a farmer for our story', 'what sort of boats did the ancient Egyptians have?'. They gave each other information: 'Stacey's group is doing jewellery, let's tell them about this' and showed each other how to do things: 'put the arrow on the corner box, that'll make it bigger.'

On the Acorn I showed the children how we could drop the graphic into the text area and make it look 'like a real newspaper' as David observed. The group on the Nimbus was happy to select an image from a CD, print it and physically cut and paste, knowing their turn on the Acorn would come. We saved again and printed what we had done so far.

'In the busy newspaper office.'

Second session

By day two I had proof read the copy (as editor in chief!) and given the groups their printout. Having established that most children knew the rudiments of editing and jokingly threatened them with dire consequences if they used caps lock for one capital letter (although this is something I am quite serious about and have written the correct use of Shift and of word wrap into the Scheme of Work), the children began to edit their work. The editing went very well. Although some learnt valuable lessons about the consequences of the liberal use of the Enter key, I was pleased with their understanding. Final printouts were put on the editor's desk and groups moved on to different tasks – jokes page, weather forecast etc.

Final outcome

Session three was the most unstructured as some children were ready to paste up the final newspaper, I encouraged others to explore the computer's possibilities. Most wanted *Splosh*, some looked at the CD-Roms. Our final newspaper was a bit of a hotchpotch of styles and content, but we were concentrating on IT skills not English, and the children were impressed.

Had I achieved my objectives? A quick straw poll showed that out of the 24 children, 23 thought they knew much more about editing, 20 felt more at home with the menu and with printing, 17 thought they would remember about saving without instructions. I learnt a lot: a tight structure is necessary to keep the children involved and fulfilling objectives; that even ensuring a mix of girls and boys in a group does not prevent them from splitting into girls and boys; quite a few needed to develop basic mouse skills and high quality images really fill up discs quickly!

'Reading a quality newspaper.'

References

Hardware:
1 Compaq with CD drive
3 A7000 with CD drives
2 A4000
2 RM186

Software:
Textease
PenDown
WriteOn
Junior Impression
Front Page Extra

CD-Roms:
Microsoft *Ancient Lands*
SEMERC *Treasure Chest*
Kingfisher *Micropaedia*

Organisation
Children: 14 Year 3 and 10 Year 4 in six mixed age and ability groups.
Time: Monday, Wednesday and Friday 1.30–3.15 pm during the Spring Term.

Roameround the curriculum

Gillian Cutts
BA Hons (Primary Education) student at the University of Central England

How can Logo, Baby Logo and Roamer most effectively be introduced to children? An assessment founded on school based observation, research and learning theories.

Logo, Baby Logo and Roamer were chosen as the focus for research as they link to the school's Mathematics and Information Technology (IT) schemes of work which require children to utilise Logo to explore the concepts of angle, distance and direction. The use of Logo is recommended in the Non-Statutory Guidelines for Mathematics (1989) which suggest that children can use Logo commands 'to draw pictures, sketches or diagrams' (NCC 1989, p F3, para 3.4).

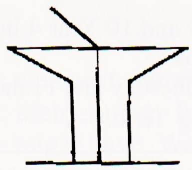
During one morning per week, over a period of nine weeks, two pairs of children from Years Four and Five (with minimal experience of the three applications) were observed working in mixed ability and gender pairings. For the first half of the morning, one pair used either Logo or Baby Logo, whilst the other worked with Roamer. The positions were reversed during the second half of the morning. Organising the children in this way provided the opportunity for assessing whether children's understanding was affected by the order in which the applications were introduced. As the observations were conducted with colleagues, it was possible for both pairs of children to be observed simultaneously.

Baby Logo is a simple program which allows an arrow on the computer screen to be moved forward or back or turned left or right, using the 'F', 'B', 'L' or 'R' keys, to produce lines, shapes or patterns. It allows children to become familiar with direction, distance and movement along a line. It provides an introduction to angle in that the arrow on the screen can be moved in stages of 45° each time the 'L' or 'R' key is pressed although the measurement of angle is not made explicit. Children can therefore utilise the program effectively without any formal knowledge or understanding of angle measures.

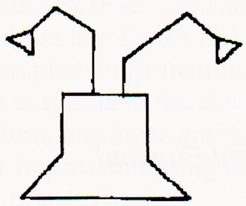
Children were initially encouraged to explore Baby Logo so that they could familiarise themselves with its capabilities. This also enabled the teacher to gain some information about the children. James (1995) suggests that:

> '. . . allowing children time to explore and investigate . . . capabilities gives the teacher an opportunity to observe their interaction and gives an insight into the way in which children develop their thinking processes' (p 25).

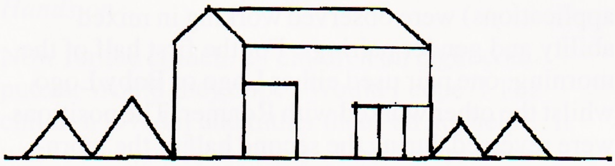
The simplicity of the program encouraged confidence and independence within the children who appeared to enjoy producing their own pictures and patterns, many of which displayed considerable creativity and imagination. For example, Robert produced the following picture of a wine glass containing a straw:



Lydia produced the picture shown below, which she described as 'a vase of flowers':



Lara drew a three-dimensional house:



Whilst observing the children, it became apparent that pictures could be drawn using the 'R' and 'F' keys only. Children, therefore, did not adapt to using the most applicable directional command. Consequently, Baby Logo did not adequately prepare children for the more advanced Logo which requires precise instructions. It needed to be determined whether Roamer would serve as a more effective introduction to Logo.

Roamer, often referred to as a 'floor turtle', moves along the floor in the same way as the arrow in Baby Logo moves around the screen. It can be directed to any position using the arrow direction keys on the robot's control pad and then inputting a number which specifies the degree of turn and the distance to be moved forward or back. For example, the command '← 90' will turn the robot left through 90°. Similarly, a command of '^1' will move Roamer forward a distance of one unit. Pressing 'GO' confirms the instruction and the robot moves accordingly.

The children were encouraged to experiment with the different commands to become familiar with the robot's movements. They soon discovered that small numbers moved Roamer a reasonable distance and that numbers under 5 were sufficient when using the forward or back commands.

Whilst observing children engaged in 'free play' with Roamer, it was apparent that when using the left or right commands, they expected the robot not only to turn but also to move forward. For example, Tim inputted the command '← 1'. He predicted that the robot would 'turn left and then move forward one step'. When the command was confirmed, there was no noticeable effect on the robot because it had only turned through 1°. However, Tim was unable to identify the error in his command. After some discussion about quarter turns and right angles, and further experimentation, Tim realised that '← 90' was needed in order to turn Roamer through a right angle and that a further 'forward' command was necessary to enable Roamer to move off the spot. Straker (1989) believes that when something goes wrong or something unexpected happens, it is a step on the way to further discoveries:

> 'it is through thinking and talking about what might be wrong and experimenting to put it right, that deeper understanding of the underlying ideas is achieved' (p 101).

Sawyer (1993) also suggests that:

> 'the identification of error can become the new starting point for further investigation' (p 51).

Although some knowledge of angle measures is helpful, it was found that once children were aware that '90' was needed to move the 'turtle' through a right angle, they retained the information and were able to subsequently manoeuvre Roamer without any further intervention from the teacher.

Ainley and Goldstein (1988) identify the 'floor turtle' as being important for children whose concept of angle is not complete because children can observe the effect of their commands on the robot's movements instantaneously. It can also be used to introduce new angles, for example, the distance turned by the robot in response to the command 'right 45' can be compared to its movement following a command of 'right 90'.

After children had spent some time investigating Roamer, they were given some directed challenges. The teacher constructed a path through which each child took turns to direct the robot. Crompton (1989) identified such an activity as providing opportunities for children to be involved in:

> '. . . planning, predicting and testing. It also involves measurement and the use of numbers' (p 133).

The children also needed to think about the direction in which the robot should turn. During the activity, many children displayed some confusion about whether Roamer should be instructed to turn left or right. In order to solve the problem, they would stand behind the robot, putting themselves in its place, to help them choose the correct command.

As Roamer moves along the floor, it is tangible and children can interact with it in meaningful and purposeful contexts. The commands used to manoeuvre Roamer around a path are analogous to directions someone might give to a motorist. Indeed, whilst observing his partner directing Roamer along a path, Peter said 'it's like when you're on a driving test'. The children were encouraged to construct paths for each other and appeared to gain immense enjoyment and satisfaction from devising complicated routes and then observing their partner attempting the challenge. Wellington (1985) suggests that:

> 'the problem-solving which arises from trying to achieve these self-defined goals, can lead to sustained logical thought and a high level of discussion and argument between children' (p 106).

Children who had experienced Roamer were then observed working with Logo. These observations were contrasted to those made of children using Logo prior to Roamer. Logo is similar to Baby Logo in that lines can be drawn on the screen. Instructions are similar to those given to Roamer in that a number must be inputted after a directional command to determine the length or degree of turn in which the triangle is required to move. Logo encourages children to utilise larger numbers as the 'screen turtle' only moves approximately one centimetre to the distance command of 10.

The questionnaire indicates that Hannah gained some understanding of the distances involved in both Roamer and Logo and that she realised that the numbers used on one could not be transferred to the other in terms of length.

Children were shown how the 'turtle' moves around the screen before being given time to familiarise themselves with the program. Blows and Wray (1989) suggest that:

> 'children should be allowed to discover as much as they can for themselves' (p 120).

Did you like the activity you did on the computer?

Yes ✓ **No** ——

What did you learn from doing this activity?

I learnt quite a bit such as how far distances are on the Logo and Roma; the distances are a lot shorter on the Logo than the Roma.

Papert (1980) felt that children should find all the answers without adult help. However, Crompton (1989) realises that the teacher should be prepared to:

> 'ask the right questions and guide the child forward in the process of discovery' (p 136).

A simple route was photocopied on to an acetate sheet and attached to the computer screen. This provided an interesting context which linked effectively to the challenges posed with Roamer as well as building on the skills of problem-solving and estimation. Hughes (1986) identified that a considerable amount of planning and problem-solving is required in Logo. He suggests that Logo can introduce children to mathematical concepts and develop their mathematical understanding in a way that interests and stimulates them. During observations, it was found that many children expected the 'left' or 'right' commands to move the 'turtle' to the left or right. Blows and Wray (1989) found that:

> 'children will often expect 'left 100' to move the turtle 100 steps to the left and be surprised when it turns instead' (p 120).

Biggs and Shaw (1995) suggest that:

> 'the first skill to learn is that the linear commands (forward and backwards) must be kept separate from turning commands (left and right)' (p 198).

Once they discovered that these commands only rotated the 'turtle' on the spot, most children soon acquired the knowledge that '90' moved the 'turtle' through a quarter turn. It was also found that when the 'turtle' is turned on an angle other than a quarter or half turn, the triangle becomes distorted and its directionality is not always obvious. Additionally, the 'turtle' cannot be observed executing its instructions because it disappears and reappears simultaneously with a new orientation. Some children became confused about which direction to move the 'turtle' because, as they look at the screen, it appears to move up or down (rather than forwards or backwards). For example, Luke tried to type 'DN' to move the 'turtle' down. He was reminded of the commands available and encouraged to stand up and put himself in the place of the 'turtle'. This helped him to choose the correct instruction.

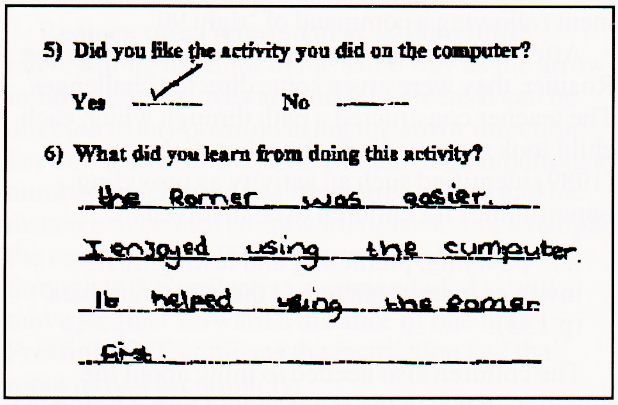
Some children had difficulty in deciding whether the 'turtle' needed to turn left or right when it was facing towards the bottom of the screen. These observations reflect those of Ainley and Goldstein (1988) who found that:

> 'when the 'turtle' is pointing downwards, it can be difficult to predict the turn needed to get the 'turtle' to point in a particular direction' (p 33).

Observations also showed that if too large a number is used, the 'turtle' can go off the screen. For example, Linda typed in 'FD 300' which resulted in the line going off the edge of the screen and the 'turtle' disappearing. She did not realise that in order for the 'turtle' to return to the screen, a 'back' command was needed. After using a few 'left' and 'right' commands, she became confused about the position of the 'turtle' and it was suggested that she clear the screen and start again. This is where Roamer is useful because the robot's response to commands can always be observed. Indeed, when Linda was introduced to Roamer after using Logo, she commented that 'when the arrow goes off the screen, it's difficult to get it back because you can't see it but you can always see the floor one'.

It could be argued that the difficulties experienced by many children as they worked with Logo was because a triangle moving around a computer screen is more abstract than a robot moving along the floor. As discussed earlier, the movement and direction of the 'screen turtle' is not always obvious. However, children appeared to be able to overcome difficulties when the 'screen turtle' was related to a concrete example. Where children had used Roamer prior to Logo, they could be encouraged to relate their experience of the robot to the computer. It can be seen from the questionnaire that Luke found Roamer helpful in preparing him for using Logo.

Even when children are competent with Logo, they may still need to return to the 'floor turtle' to develop or formulate their ideas. For example, it was necessary for some children to return to Roamer in order to introduce the 'repeat' facility. Stephanie and Robert had difficulties understanding the function when initially introduced to it on the computer. They were encouraged to return to Roamer and, after some experimenting, they were able to move the robot in a square using the command 'Repeat 4 [^3 ← 90]'. They then transferred the command to Logo and produced a square on the screen. Roamer can also be useful in identifying an error in a Logo command. Biggs and Shaw (1995) suggest that work with Roamer:



5) Did you like the activity you did on the computer?

Yes ✓ No

6) What did you learn from doing this activity?

the Romer was easier.
I enjoyed using the cumputer.
It helped using the Romer first.

> 'should be repeated at regular intervals to consolidate work done on the computer' (p 219).

After observing children experiencing Baby Logo, Roamer and Logo in different orders, it appears that Baby Logo provides a useful introduction to Logo in that both programs allow pictures and patterns to be produced by an arrow on the screen. However, Baby Logo does not prepare children for the numerical instructions needed to operate both Logo and Roamer. There are, therefore, fewer opportunities for children using Baby Logo to acquire and develop the mathematical skills and concepts that are required by Logo and Roamer.

Children who experienced Roamer prior to Logo appeared to understand the concept of the 'screen turtle' more effectively than those children who used Logo and then moved to Roamer. The concrete world of Roamer appeared to provide a meaningful context for children to gain the knowledge and skills needed to enter the abstract world of Logo.

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IT Activity Sheet 1

A. ***Title***: **MATCHING** (an idea from Janet Barnett of Wychall Farm School Nursery Unit)

Activity: Using a floor robot to support other areas of the curriculum.

Resources: A Roamer, Pixie or Pip, a large die with a different colour on each face, and a set of laminated mats corresponding to the colours on the die.

What to do: Set the mats out in a straight line so that they are exactly one robot step apart. Children take it in turns to throw the die and name the colour. Before they send the robot to the mat they walk the journey themselves to establish the one-to-one relationship between mats and steps.

Possible extension activities: Use number cards or shape recognition cards. Turn the robot into a postman. Put letters addressed to the children in a bag, take one out at a time and ask a child to program the robot to deliver it to the correct child.

IT capability: Controlling and modelling (b) at KS1.

B. ***Title***: **OVER TO YOU**

Activity: Estimating distance.

Resources: A Roamer, Pixie or Pip.

What to do: Children will need previous experience of keypad commands and estimating distances. A small group of children sit in a circle and programme the robot to visit a friend on the opposite side.

Possible extension activities: Increase the diameter of the circle. Sit in rows so that the distance between children varies.

IT Capability: Controlling and modelling (b) at KS 1. Controlling, monitoring and modelling (a) at KS 2.

C. ***Title***: **PUSHBALL** (an idea from Reg Eyre)

Activity: Estimating distance and direction.

Resources: A floor robot and a goal.

What to do: Make a goal out of any suitable equipment. Program the robot to push an airflow ball through the goal without knocking it down.

Possible extension activities: Vary the starting positions of the robot and the ball. Play hockey by sticking an arm or stick to the side of the robot and use only that to hit the ball.

IT Capability: Controlling and modelling (b) at KS 1. Controlling, monitoring and modelling (a) at KS 2 (Level 3/4 for the extension activity).

IT Activity Sheet 1

Communicating and handling info. A

Controlling, monitoring and modelling A B C

A B C

Experience level
Beginner A B
Intermediate C
Experienced

MAPE
Micros And Primary Education

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IT Activity Sheet 2

D. Title: **PUSH ROAMER** (an idea from Lisa Minifie)

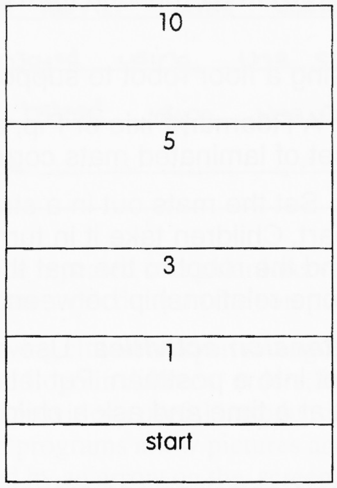
Activity: Estimating distance.

Resources: A floor robot and target.

What to do: Children will need experience of keypad commands and estimating different distances. Children take it in turns to aim to get the Roamer's head into one of the scoring zones. Record the score. Repeat this two or more times. The winner is the person with the highest total.

Possible extension activities: Set a target total. Alter the numbers on the target. Vary the distances in the scoring zones.

IT Capability: Controlling and modelling (b) at KS 1. Controlling, monitoring and modelling (a) at KS 2.

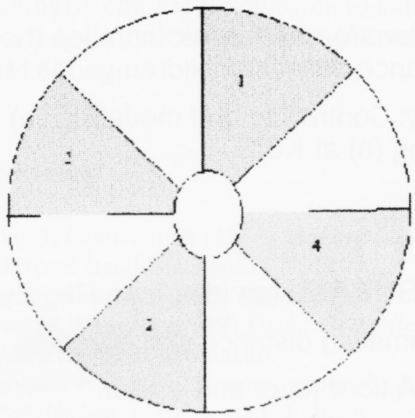


E. Title: **TURN ROAMER** (an idea from Lisa Minifie)

Activity: Program a floor robot to turn and face a scoring zone.

Resources: Roamer, Pixie or Pip, a large circle divided into 8 equal segments.

What to do: The children will need previous experience of giving turning instructions. Put the floor robot in the centre of the circle. Give instructions to turn the floor robot so that its head points at each scoring zone in turn. The winner is the child who uses the least number of commands.



Possible extension activities: Increase the number of scoring zones so that the turns are not 90°. Vary the sizes of each scoring zone. Set a target score. The winner is the child who achieves it with the fewest commands.

IT Capability: Controlling and modelling (b) at KS1. Controlling, monitoring and modelling (a) at KS 2.

Experience level
Beginner D
Intermediate D E
Experienced

E

D

Communicating and handling info. D

Controlling, monitoring and modelling D E

IT Activity Sheet 2

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IT Activity Sheet 3

F. Title: **ROAMER SKITTLES**

Activity: Program the floor turtle to knock down the skittles. This will involve **fd**, **bk** and turns.

Resources: Roamer, Pip, or Pixie, skittles or towers made of multilink.

What to do: The children will need experience of using turning instructions. Children sit facing a row of skittles, they take it in turns to see how many skittles they can knock down using only a limited number of commands.

Possible extension activities: Write a procedure using a limited number of commands. Aim to knock down only red skittles, leave other colours standing. Number the skittles, stand them in randomly, children must knock them over in numerical order.

IT Capability: Controlling, monitoring and modelling (a) at KS 2 Level 3/4.

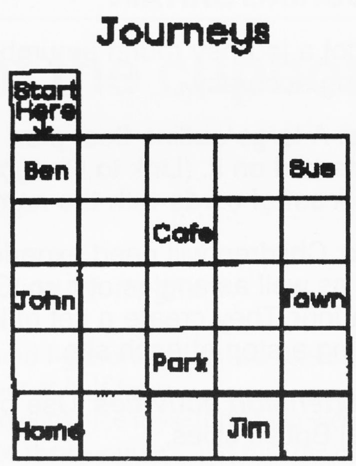
G. Title: **JOURNEYS** (an idea from Lisa Minifie)

Activity: Write a procedure to send a robot on a journey.

Resources: Roamer, Pixie or Pip, a large floor plan of a village. (Janet Barnett suggests buying a large sheet of strong plastic and permanently marking a grid based on the size of your robot's steps.)

What to do: One pair of children gives instructions such as 'Call for Jim then go to the park.' The second pair has to program the robot to carry out the instructions. Pairs swap over.

Possible extension activities: Give children a written procedure and see if they can work out who was visited.



IT Capability: Controlling, monitoring and modelling (a) at KS 2, Level 3/4.

IT Activity Sheet 3

Communicating and handling info. F

Controlling, monitoring and modelling F G

Experience level
Beginner
Intermediate F G
Experienced G

IT Activity Sheet 4

H. Title: **LOCI** (an idea from Reg Eyre)

Activity: Investigating shapes

Resources: A floor robot, a large sheet of plain paper, and several thick pens.

What to do: Children will need experience of distance and direction and a knowledge of shapes. Stick pens to front, back and/or sides of the robot. Write simple procedures and investigate the shapes drawn by the different pens.

Possible extension activities: Investigate the effects of altering the position of the pens or drawing different shapes.

IT Capability: Controlling, monitoring and modelling (a) at KS 2.

I. Title: **TOURING BRITAIN**

Activity: Plot a journey round a number of British cities, with emphasis on increasing accuracy.

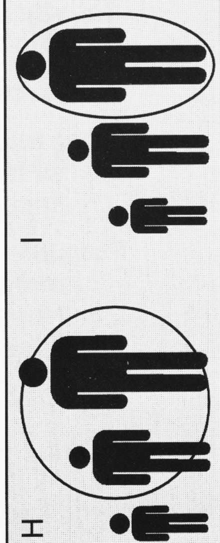
Resources: A large outline floor plan of Britain (or part of it) with some places to visit marked on it. (Link to Geography contrasting UK locality). A floor turtle, or Logo. A set of cards with the names of the places.

What to do: Children will need experience of estimating distances using a floor turtle, as well as angles of turn. Children take 3 (or more) cards at random and plan a tour. They create a set of instructions to send the turtle on its tour, including a stop at each site.

Possible extension activities: Use bearings and distance to plan a journey round several British cities.

IT Capability: Controlling, monitoring and modelling (a) at KS 2 Level 4/5.

Experience level
Beginner
Intermediate H I
Experienced H I



Communicating and handling info. H I

Controlling, monitoring and modelling H I

IT Activity Sheet 4

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Roamer reaps rewards

Lisa Minifie
NQT

In this article Lisa explains how she used many of the activities from the centre pages of this issue in school.

I was recently involved in a Maths Week with a group of fellow 4th year B.Ed. maths students. The aim was to raise the profile of maths within the school using a variety of activities. I chose to focus my attention on using Roamer, and planned a progression of activities using basic Roamer skills.

It did not take long before the children had grasped the idea of programming Roamer, and were using the activities to aid their estimation, distance and direction skills in a fun and enjoyable way. One child commented 'this beats estimating the width of the classroom!', but didn't realise that this was precisely what he was doing! Through the demonstration of basic features of Roamer the children were keen to explore far more skills for themselves.

Allowing the children time to explore the Roamer with simple 'move' and 'turn' commands proved to be much more beneficial in the discovery of what is meant by such values as FD 30 and RT 90 than giving them a theoretical explanation. Learning by doing is better than learning by listening.

For the children taking part in Maths Week, Roamer was an excellent introduction to the whole question of robotics and production control. It allowed them to explore concepts by using their own body to work out problems. They were encouraged to use a friend as a robot. The mathematics became a sort of language to describe how their body, then Roamer, moved. It was not just a series of formulae and rules to be learned by rote.

These activities encouraged children to break a problem down into its smaller constituent parts; it inspired even those who claim to find maths boring. Learning through Roamer was an adventure for everyone.

Getting the Roamers out of the cupboard

Sally Smith
IT co-ordinator at Phoenix Infant and Nursery School, Gedling, Nottingham

As IT co-ordinator even I groaned when my name came up on the rota to have one of the two Roamers in school. I was fine for the first week; I know how to start the children off using the Roamer, but then I become stuck at the same point each time. Twice a year we began with an introductory session in the hall. I am very happy with that session, I have even used a modified version for our staff on an INSET day, so no doubt the children in the older classes experience something similar.

Whenever Class 4 had the Roamer again, we took her into the hall, and gave her a name (they are now called Rosie and Wilma; the children know the difference but I forget every time). We learnt how to send her across the circle and we could estimate how far she needed to go. Then back in the classroom where the children were allowed to play with Rosie (or Wilma). For a few days they were enthusiastic, but soon they were choosing other activities and I gratefully handed Rosie to the next poor teacher at half term.

I tried to convince myself that we were making good use of the resources, and that the children were benefiting from their activities with the Roamers. But I knew that I was failing and that many of the other staff never even took the Roamers from the boxes when it was their turn. I had read articles about teachers who made models of streets and mazes and I was becoming convinced that that was what we should be doing, but the practicalities kept getting in the way.

But then I experienced a turning point. We had a set of plastic covers for the Roamers so I set each group of children in my class the task of designing a cover to change Rosie into a butterfly (to link in with our work on *The Hungry Caterpillar*). They all tried hard and we soon had five beautiful butterfly covers. So, what next? I cut out some card

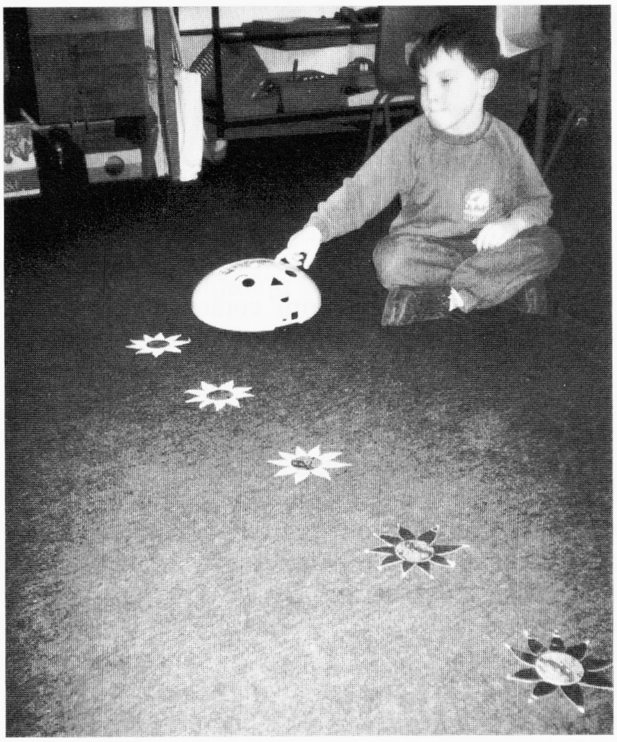


Fig. 1. *Roaming round the garden.*

flowers so the butterflies could visit the flowers to collect the pollen, and as we played we developed a game. We put the flowers in a straight line on the floor one Roamer distance apart and sent the butterfly to stop next to a flower. If a child managed to make Rosie stop by a flower they collected the flower. No-one was allowed to pick her up so they had to make her go backwards and forwards. The children tried to collect as many flowers as possible.

We were off into a new world, and soon other games were developed along the same lines. Rosie was going forwards and backwards collecting Roger, Billy, Johnny and Jennifer, or apples, or presents, depending on the topic. We varied things slightly, putting cubes on the flowers. Collecting cubes made the game longer, and helped the children see how far it would be to the next flower with a cube. This was particularly useful when the whole class played the games so everyone could collect at least one cube.

I even found time to make a copy of all the games so a set could be kept with each Roamer for the other classes to use. These are now kept in plastic wallets in old National Curriculum folders. Our ideas were spreading and other staff were more willing to take the Roamers from the boxes. I realised that this was fine for the other younger classes, but the Y2 children would need something to stretch them, and to provide some progression. I did this by making the content of the games more demanding, and by extending the functions they would use on the Roamer.

The first new cards were the numbers to 10. This led to many new games. If the cards were put down randomly then the children had to make the Roamer visit the numbers in order. They could extend their IT abilities by making the Roamer stop at each number, or make a noise, or turn right round etc. If the cards were put down in order the children could shake a die to see which card to visit, and so the possibilities become limited only by the children's and the teachers' imaginations. I also developed a worksheet which was made of lines of six squares. The children put numbers in the first and last squares and then filled the other four squares with the buttons on the Roamer they needed to press to get from the first to the last. Some children predicted what they would use from their mathematical knowledge and then checked with the Roamer.

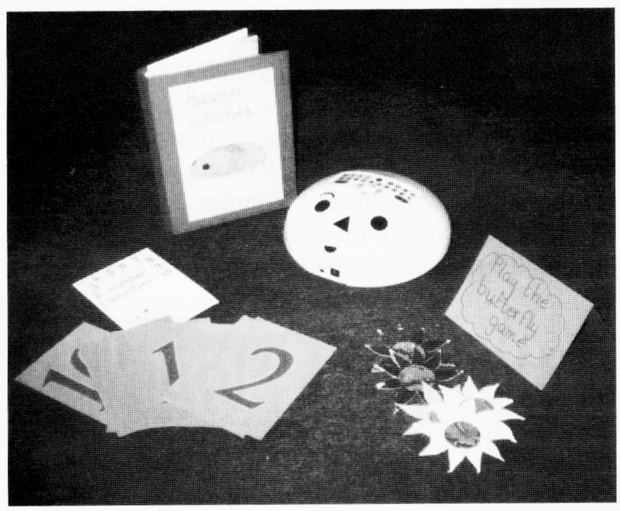


Fig. 2. *Simple equipment for Roamer activities.*

Another favourite activity that developed as the children's abilities grew was to start with Rosie on a small picture of a Roamer. The children had to program her so that she moved off the picture and then returned so they could no longer see it. The instructions could become more complex as the children gained in confidence, though initially I restricted the children to no numbers above three, (forward 10 backward 10 was becoming a popular choice and the classroom hadn't always got that much room).

Our latest game was developed by the children on the same lines as the earlier games. Working with a student Nursery Nurse they made cards showing different ways of going on holiday and wrote out the instructions, then tried the game on some children from an older class, who enjoyed it and will hopefully play it when it's their turn for Rosie.

So now I am waiting until our class comes up on the Roamer rota again. There is so much beyond the 'just play with it' stage that the children can get on with independently. Although they need reminding of how to use the Roamer they soon remember and are finding games for themselves and inventing new ones. When we can, we borrow both Roamers and play the games in teams (who can collect most cubes in 10 minutes?).

As IT co-ordinator I hope it will become harder to borrow the other Roamer, because it should be in use elsewhere, but as a class teacher I would rather the other classes didn't use it so we can enjoy having both!

Fig. 3. *Two Roamers – more than twice the fun.*

Controlling the traffic: a primary school staff development project

Chris Taylor
University of Exeter

The Rationale

This work started when a local primary school asked me to help them to develop ideas for using control technology in their Key Stage 2 curriculum. Although the teachers had a good range of computers in their classes they were new to control technology, and wanted something that would fit in with the topic of 'Survival' being studied by Years 4, 5 and 6. I attended a planning meeting so that I could devise activities to fit this topic, and to give the teachers some sense of ownership of the project. I was asked to do something which would fit in with Road Safety. It was decided that the Years 3 and 4 pupils would work with a floor robot, while the children in Years 5 and 6 could make powered vehicles and sets of traffic lights. I had only half a day each week available to work in the school so it was agreed that I would concentrate on one group in each class, provide teaching resources, and give the teachers enough support to enable them to continue with other groups.

Resources

At that time the school had no control resources, but was ordering a Pip and Pixie (floor robots manufactured by Swallow Systems). I agreed to lend a Pip from the university and a Deltronics Control Box until such time as they could buy their own. During the course of the term Pip had to return as it was needed elsewhere, so I replaced it with a Roamer (manufactured by Valiant Technology). This gave the school the opportunity to try out both floor robots with their classes.

Year 3 children and floor robots

The first sessions with the Year 3 pupils were spent getting to know the children, showing them how to use the floor robot and passing on ideas to the teachers. I had been asked to work with ideas based on shape and scale. I devised some simple exercises designed to introduce the children to the different keys. These seemed to work well.

Activities and observations

1. Visit a friend
Six children sit in a circle and send the robot from one to another.
Purpose: Estimating distances (Pixie lengths).
Comments: There were few problems with this exercise, but some children took a couple of goes before they could estimate with any accuracy.

2. House calls
Six children sit in a circle and send the robot to visit one child, then make it turn to go to another child.
Purpose: Pupils learned to use the wait and turn keys as well as estimating the distances.
Comments: It was noticeably more difficult for them to estimate a distance when the robot was not starting from right in front of them. Some of the children just could not visualise the robot turning (even though it was only using units of 90 degrees). There was an enormous variation in conceptual ability, far more than I was anticipating. There were one or two children in each group who ended up pressing buttons at random, rather than making intelligent guesses about where the robot should travel.

3. Demolition robot
Children sit in two rows, facing each other with a set of multilink skittles in the middle, each takes a turn to see how many skittles they can knock down.
Purpose: This involves estimating distance and making the robot turn.
Comments: With this exercise, most managed to estimate distance reasonably well. Some then got the robot to make carefully calculated turns to hit the skittle on the edge of the group. Others made random key presses, and the robot ended up wiggling around far away from the group of skittles.

4. The obstacle trail
The children sit in two rows facing each other; they have to program the robot to travel along an obstacle trail, firstly in separate stages, then in one continuous program.
Comments: This exercise worked very well. Different groups adopted different strategies to help solve the problem. One group wrote down the steps as they went along. Another group tested each part of the obstacle trail before putting the commands together to make a complete program. Some of the groups had difficulty with the simple ideas of working together, helping each other and taking turns, and I had to intervene to ensure all participated.

5. Maps
The next step was to introduce the children to maps.

Having created a treasure island or a street map the children program Pixie to travel around the map and then write down the sets of instructions they give the robots. I asked them to predict the instructions for programming Pixie round a particular route; they tested it out. Next I asked them to create their own maps and work out similar exercises for the robot.

They found it surprisingly difficult to write down a program of instructions for the robot to undertake; only a small proportion of them were able to visualise themselves in the place of the robot as it travelled around the map. It was easier for them to write a program after it had happened, rather than before. It would seem that, at this stage, there is still some difficulty in conceptualising movement into a set of instructions, particularly involving another object. Despite these difficulties, the children enjoyed the activity, commenting, 'It's better than the skittles because it's harder.'

As a follow-up to this activity, I asked the children to create their own treasure islands for Pixie to travel around, with lots of hazards to be avoided. They were very excited by this and greatly enjoyed the activity. Some had started to think about scale, saying their maps (on A4 paper) were far too small for the real Pixie, so they cut out miniature paper Pixies. When asked to write down a set of instructions to find the treasure, they were somewhat flummoxed. They could draw it in arrows, but not write it in directions. A number of children solved this problem by drawing sets of footprints across their maps – a novel solution to the problem of devising a form of notation.

All these observations surprised me, as the children were not of below average ability, and appeared to be well integrated socially. I was particularly struck at the variations in ability, in visual conceptualisation as well as social co-operation. It will be necessary for teachers to maintain careful observations to see if use of the floor robots actually help develop these skills.

The exercises gave a structured development for the children to investigate Pixie's working. They also felt it was like play as we made the activities into games, with a little bit of competition. I believe this was a better approach than just allowing free play. Time was limited, and although free play with floor robots does provide opportunities for children to interact with the technology at a superficial level, it does not guarantee transmission of all the concepts and programming skills I wanted the children to use.

Year 4 children

The Year 4 class working with floor robots needed a lot less input than the Year 3 classes, partly because the teacher concerned had used a Roamer whilst at college. We started off using Pip, but had to swap it for Roamer when Pip was needed back at the university. I spent time with different groups from the class until all were confident about using both

Pip and Roamer. Once they had been shown the essential differences between the two machines, there were no problems in transferring skills. They then took some of my ideas and added their own, creating a floor map of a town with road signs, houses, shops and other buildings, as well as road junctions where the robot would have to stop and wait to look for other traffic. They were able to program the robots to travel around the roads, turn corners, wait at junctions and return to where they had started, although a fair amount of trial and error, problem solving and estimating had to take place before the robots would go where they wanted. Shopping lists were considered so that a robot shopping trip could be programmed. The children were able to create programs, write them down and modify them as necessary. Because they were more independent, and I was working with the Year 5 and 6 pupils at the time, I was not able to observe so closely as with the Year 3 pupils.

What have I learned about teaching and learning with floor robots from this?

1. Group size is important
Children need to be able to interact with each other and the robot, and to take control of the robot. When working in groups of six, children spent too long waiting for a turn; groups of four were much more manageable. The use of an adult helper to oversee this work would also probably prevent a lot of wasted time.

2. The growth of abstract conceptualisation.
Whilst in the past I have quite happily recommended that floor robots should be used with Key Stage 1 pupils, I now question to what extent they can learn concepts from their use. I am not sure about how much children can learn from them without structure, support and direction. From the groups of children I was working with, there certainly seems to be a significant growth in abstract conceptualisation between Year 3 and 4. This judgement is based on how the Year 4 pupils were able to function much more independently, use angles, co-operate and integrate the floor robot into other activities.

3. The need for structured teaching
It is no good assuming that children will find out the more advanced features of the robots by accident. They had to be taught the syntax for programming repeats with both Roamer and Pip. They were reluctant to write down the programs they had written, and should be encouraged to develop ways of notating the programs they have created, and learn to test and modify those programs.

At Year 3, children can describe individual steps in a program. They have difficulty putting sets of instructions into words, even when they are relatively simple like forward 5, turn left, forward 4, turn left, forward 2, stop. Even if they are able to visualise correctly the instruction in their heads, and give those instructions to the robot, they still have difficulty in turning these into written words. This suggests that we should spend more time in Year 3 getting children to sequence everyday activities and write them down. By Year 4, these skills seem much more developed.

Obviously there are limits to the validity of these observations. They were not undertaken in an experimental context, I was undertaking action research, working in classrooms with groups of children, most of whom had never used floor robots before. However, there were 120 children involved in this study, split between Years 3 and 4, which is a sufficiently large sample to have some validity. My observations were also backed up by the observations and comments of the class teachers.

Benefits to the school

The staff had no difficulties in coming to grips with the floor robots. What I hope, is that this school will now have a firm basis on which to develop work with control technology, and as the children become more confident with the programming and problem solving elements they will pass this confidence on to their teachers who will then be able to use the ideas in a greater range of curriculum contexts.

Controlling the traffic

1. Making the buggies
Initially, the Year 5 and 6 groups started with a D&T activity, making simple push buggies using cardboard boxes, dowelling axles and card wheels. Once they had successfully completed these, they progressed to making simple motorised buggies based on a chassis constructed from 8 mm × 8 mm wood strip, using a small electric motor and MDF (medium density fibreboard) wheels. They also had to construct switches; a number made remote control handsets, and added lights to their vehicles. Although most of the children had made electric circuits in the past, this work reinforced aspects many of them had forgotten, and gave them the opportunity to make switches or to do soldering. There were also some children who had recently come to the school from the private sector, and had had no experience of National Curriculum Science or D&T.

The children found that by reversing the wiring of the battery they could change the direction of the vehicle, so one group experimented with two-way switches to make the buggy go forwards and backwards. These D&T activities provided the curriculum context for use of the computer, and the problem-solving skills the children were using in wiring up their vehicles were similar to those needed for the buffer box and computer. The class teachers kept in close touch with what was going on, by coming to observe, talking to the pupils and encouraging them to continue with the work when I wasn't there.

2. Making the traffic lights

The next stage was for them to make traffic lights, using wooden 8 × 8 strips, with bulb holders hot glued to them. They had to use 6 V bulbs as they quickly found that 2 V bulbs did not last long when connected up to the 6 V power supply of the Deltronics box. There were some technical problems in that it was not possible to use their A3000/4000 computers because of a lack of user ports. Instead, an old BBC was wheeled out and I supplied my copy of *Contact*. I showed the children how to switch bulbs on and off and how to write short programs. I then gave them a simple worksheet so they could work through the rest for themselves. There was plenty of discussion about the traffic light sequence; eventually a satisfactory sequence was found resembling real traffic lights. The children were able to program it to repeat, change the timing and save it as a procedure. There were a number of problems to overcome – the lights had to come on in the correct order; sometimes they forgot to switch lights off so that red, green and amber were all showing at once; and the timings had to be made long enough to feel real.

Sample traffic light sequence using *Contact*

```
BUILD LIGHT
REPEAT 5
SWITCH ON 1
WAIT 3
SWITCH ON 2
WAIT 1
SWITCH OFF 1
SWITCH OFF 2
SWITCH ON 3
WAIT 5
SWITCH OFF 3
END
```

3. External control

The next stage was to add some external control. We didn't have a pressure pad to sense cars passing, so it was decided to use an ordinary push switch enabling pedestrians to stop the sequence and change the lights to red. This required more sophisticated programming as the computer needs to continually scan the input to see if the switch is being pushed, and then the program has to be stopped long enough for the pedestrians to cross the road. Eventually, with a little help, the children cracked it – a push on the button and the lights would stop on red for a while, then the sequence would restart when there had been enough time for the pedestrians to cross. Unfortunately, we could not add a buzzer as we didn't have one, or a flashing green man as there were no spare 6 V bulbs.

Sample procedure to add switch control to the lights

```
BUILD SWITCH
REPEAT 1000
IF INPUTON? 1 <LIGHT>
END
```

Benefits to the school

The teachers couldn't spend all their time with the group (they had the rest of the class to look after), but they had managed to spend some time observing and talking about what the children were doing. I was able to take them through the programming aspects of the activity, and let them have copies of the sheets the children had been using. At the end of the project, I asked them if they felt they could now use this equipment effectively and fit it in with curriculum activities. They all felt confident that they had enough background to make a good start at it. They also felt the pupils had learned a lot, partly from the model making and electrical wiring, but also from the programming. The children had been forced to work accurately, to use precise language and to experiment with different ideas to try out cause and effect. This might have been easier if the children had previously used *Logo*, as they would have had more confidence in programming and problem solving.

The school is limited in terms of further development, because there is no money to purchase a Deltronics box in this financial year. The teachers are confident about using their own floor robots, a Pixie and a Pip Mark 2, and feel they have made a sound start in using control technology. As a model for staff development, this kind of external input must have a lot going for it in terms of working in a real and familiar classroom context. The main problems were due to my time restrictions, and the lack of money in the school to buy the necessary equipment after I had finished.

If you want to start working with control technology in your school, I suggest you consider the following steps:

1. Look at how it can be integrated into the curriculum. There is no point in doing an activity just for its own sake – there are opportunities in Science, Maths and Design Technology.
2. Decide what equipment you need to buy and how much it will cost you. I would suggest at least two floor robots are needed (Pixie and Pip or Roamer), a control box (such as the Deltronics Box) with some switches and components such as lights and buzzers, and some software such as *Contact* or *CoCo*, depending on the kind of computer you wish to use. If you still have a working BBC, this is an excellent role for it.
3. Some work with Logo beforehand should help to give the children a lot of transferable skills in programming and problem solving.
4. Familiarise the staff with the software and equipment, and plan some activities to introduce it to the children. Make suitable support materials such as workcards to help guide them through the initial stages.
5. Evaluate what is going on in terms of pupil and teacher use of the equipment – is further support needed?

Don't you just love being in control?

Reg Eyre
University of Derby

Control is one of the least understood parts of the IT strand 'Control, modelling and monitoring'.

Frequently asked questions

What is Control?
Is there a progression of activities?
Where does it fit in the curriculum?
How can I get started?

I hope to answer these questions and thereby show that this is an area of work which is fairly straight forward and has many entry points.

Let me define Control as being fundamentally about the *language* used to make mechanisms do the things we want them to do.

Why a progression?

At one level, the use of floor turtles and screen graphics can be viewed as a sort of Etch-a-Sketch, whereas a look at Ableson's book on Turtle Geometry shows us that this type of work can lead to sophisticated ideas about relativity and research level mathematics!

It is therefore important to realise that a spectrum of activities is possible but that it is not necessary to follow any rigid progression. The major feature of this type of work with children is that, fairly quickly, they devise tasks for themselves and use the available technology to sort out any mistakes they might make. Sometimes they will change task because following up on a mistake may be more interesting than their original activity and might lead to discoveries not envisaged by either teacher or children. It is this approach we wish to encourage. The teacher may well set the original task but children should take over, the teacher becoming a prompter, asking questions about how things were done, why they were done, and what could be done next.

A suggested progression could well consist of the following four phases.

1. Concrete phase
The first activities involve working with a floor robot or Turtle to see the effects of simple commands and to get a feel for distances and rotations as made by these machines (see Figs 1 and 2).

2. Programming phase
The second stage is to see the clear connection between a sequence of programmed instructions and the movements of the floor turtle, that the movements of the floor turtle are directly related to the traced movements on the computer screen.

3. Abstract phase
The third stage is to think about a task as a programming problem, plan, write and de-bug the program to effect a solution.

Figs 1 and 2. *Number ladder work using Roamer and Pip in Wiltshire Schools.*

4. Extension phase
This stage involves designing and making a device which can then be controlled from the computer using the same style of programming language. This is sometimes called Control Technology.

Programmable toys

At an early stage we can ask very young children to give each other directions to move from one area of the classroom to another. We note that the language used soon needs to be refined in a mathematical sense. There is a need to say how far the child needs to move and we use this opportunity to start work on standard units, estimation and measuring activities.

The Reception class is the ideal place to use the Pixie robot. It has a control panel which shows the basic forward, back, left and right arrows but with no numbers. This means that the number of presses of any of these commands will be the number of times that command will be carried out. We can now establish a one-to-one relationship with the counting number and the movement. The whole class can count (name) the number of presses, say five, while a child presses the forward key, i.e. 'one, two, three, four, five' and then count out loud the movement with the Pixie since it has a light which flashes at the end of each unit, establishing the relationship as well as giving an idea of the fiveness of five. Other floor robots are more suitable for older children since they conform to the pattern of 'command followed by number' but only the Pixie has the numberless feature which reduces confusion for the youngest beginners of this type of work.

Many activities can be used to foster development from simple, single commands to sets of commands which carry out a complete journey or task. Most of these activities are still mathematical in nature but can easily be incorporated into topic work as geographical explorations, time lines or science experiments. A brief outline of some suitable activities can be found in the centre of this issue of *MICRO-SCOPE*.

Eventually children will begin to demand more accuracy and speed of drawing from the floor robots or floor turtles and will then be ready to use turtle graphics on the screen such as *Dart*, *Arrow* or one of the versions of Logo.

Towards procedures

A reasonable progression is to allow the children to work at 'top level', which means giving the computer direct commands which are not saved, the equivalent of giving the floor robot single separate commands to carry out a sequence of actions. This usually leads to the children wanting to know how to teach the computer a series of commands so that when mistakes are found, they can be edited out. This is called writing a procedure.

To make the computer carry out such a sequence of instructions, give the procedure a name, and type in the sequence of instructions, finishing with END. Now we type the name of the procedure at the prompt and press the return key. Any shape can be programmed in this way, such as a dog, a star or a house. If mistakes are made then we can change the commands in the procedure.

The next stage looks like shorthand, which is using the REPEAT command. To force the issue, we often show the children how to draw a square and then get them to draw all the regular polygons. Is this what they wish to do? It is a useful exercise if you are trying to elicit the relationship between the number of repeats and the angle turned each time, but of no real interest to most children for its own sake.

A much more interesting variation is to have a group of children looking at the screen. Now type REPEAT and ask for a large number to type in before writing the next set of commands. Go round the group asking each child to give a command such as forward, back, right or left followed by a number which is then typed into the computer. When everyone has had their turn, finish the sequence and see what happens. You will usually get some form of interesting rotational pattern which can be discussed. Other useful questions might be:

Is the pattern closed?

Why is this?

Why should it be?

How many commands can be put into the REPEAT command?

How few?

What relationships exist between the REPEAT number and the angles if the shape is closed?

Other useful ideas for using repeated procedures can be obtained by investigating border patterns from various cultures and periods of history. Try to identify the 'key' and write a small procedure for it. Now position the cursor and write another procedure which will repeat the key several times. After this initial success, you can set the challenge of building a rectangular border pattern, solving the problems of getting around the corners.

Ready-made procedures which incorporate 'growth' and produce spirals can be given to the children for them to investigate and find the effects of putting different numbers in. This type of work which uses teacher-written procedures is the entry point into modelling using the computer.

Control

Control at Lower Key Stage 2 requires the use of a buffer box with control software. However, there is a lot of other associated work that needs to be done first. The major problem with getting started is that the control is not the focus of the activity. Rather, it is very much an end point, a culmination to an overall topic.

To be able to control a mechanism in a meaningful manner, children (and adults) have to investigate

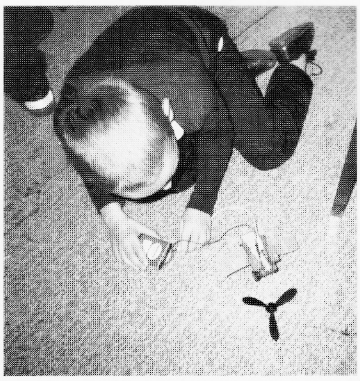


Fig. 3. *Only thorough testing shows if the mechanism is robust – whoops!*

Fig. 4. *Action and reaction.*

and build a structure which can then be used to hold a mechanism (Fig. 3). This has to contain some form of gearing and motive power, such as a motor, to perform an action (Fig. 4). Only after all this happens should we consider connection, via a buffer box, to the computer to control the mechanism (Fig. 5).

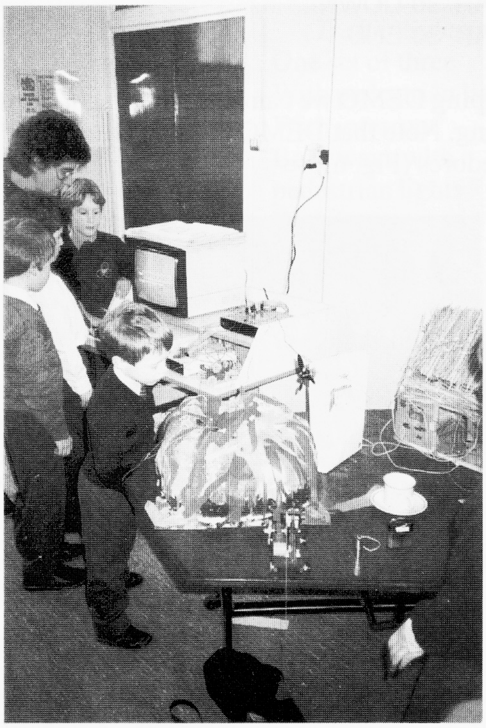


Fig. 5. *'Wow! I wonder if Vesuvius looks like this?'*

Simple switching control

An early introduction might be controlling a buzzer, or lights starting with a single light, or a set of traffic lights. If you type FLASH, the computer will respond, 'I do not know how to flash'. You will have to teach it!

Type the following:

TO FLASH	Or whatever name you choose of less than 8 letters.
REPEAT 5	This is the number of times you want the light to flash.
SWITCHON 3	This is the number of the socket the light is plugged into.
WAIT 8	This is a delay. 10 is about a second.
SWITCHOFF 3	
WAIT 7	
END	You must always put END at the end of the repeat loop.

To make the program work, type FLASH.

Linking procedures together

We may have written procedures for a lift mechanism called UP and DOWN. We may want to leave our mechanism working, to do so we can type in:

```
TO DEMO
REPEAT 12 UP
WAIT 30 DOWN
WAIT 30 END
```

By typing DEMO we can leave the mechanism running. Note that DEMO calls and runs other procedures (Fig. 6).

Fig. 6. *A lift mechanism – 'It works, but is the structure sound?'*

The software should be fairly intuitive to use. My preference is for *Control Logo* if the children have previously used *Logo*, *Contact* if they have previously used *Dart* or *Arrow* or *Lego-Lines* if you have the *Lego* system. Buffer boxes and associated

Fig. 7. *Putting the BBC to good use.*

software can generally be used on all the major computers but you may have to check which cables to use for each make of computer. I prefer to use the older computers because you can dedicate one to control, monitoring or data logging work (Fig. 7).

Monitoring

More interesting control work starts when input sensors are used to control the actions of the computer. This is also the opportunity to start the monitoring strand of IT.

We may want to leave a light turned off until it gets dark or stop a motorised car when it has gently bumped into an obstacle! Children can either use ready made devices, such as light sensors, or they can make their own simple switches to sense pressure, the opening of a door, the passing of a magnetised object, etc. (See Figs 8 and 9).

Fig. 8. *The mechanised play.*

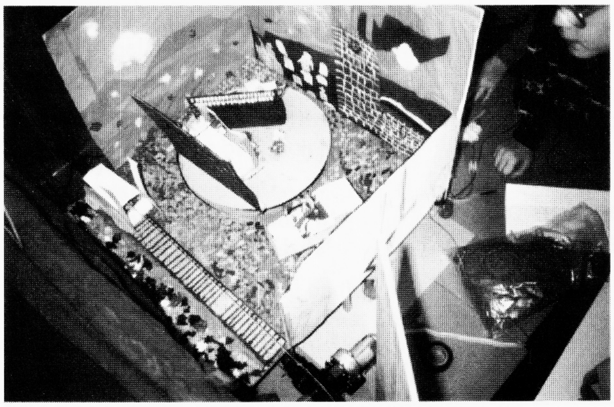


Fig. 9. *Overhead view of the set showing several mechanisms.*

These are then plugged into the input side of the buffer box. The computer does not control the actions of these devices, only outside influences can do that, but the computer can sense when a switch has been activated.

There are two ways of using inputs to control actions from the computer. There is the 'once and only once' method which will cause an action to happen, whereupon the computer will stop. This type will be used when trying, for example, to catch a marauding mouse.

```
TO CAPTURE
WAIT UNTIL INPUTON?3   there is an input
                       device of some sort
                       plugged into input
                       socket 3
SWITCHON 2             this might be a
                       buzzer plugged into
                       output socket 2
WAIT 30
SWITCHOFF 2
```

When you type in CAPTURE nothing will happen until the input device plugged into socket 3 has been activated, then the output device, in this case the buzzer will sound for three seconds.

The second type of input control is used whenever we want to monitor constantly what is happening, for example a burglar alarm protection system. After an alarm has been activated we want the system to reset and check again.

```
TO ALARM 1
IF INPUTON? 3 [SWITCHON 2]
WAIT 5
SWITCHOFF 2
ALARM 1
```

Note that the program checks if input 3 has come on, if it has the buzzer in socket 2 is switched on for a short while and the program checks again, and again and . . . If INPUT3 has not come on the program constantly checks until the input does come on.

I hope the inclusion of these procedures has not turned you off this type of work. Many interesting cross-curricular issues can be highlighted, discussed and taken forward. It goes hand in hand with Design Technology, and leads to observation of structures, mechanisms, gearing and motors as well as techniques for handling tools and materials through problem-solving processes.

Appendix

Ideas for control technology

Using only four basic technology structures a variety of control technology activities are possible. This list aims to give you some starting points and is by no means exhaustive!

Buggy
Free rolling down a slope
Motorised
Steered
Positioning
Another fitting on top (e.g. crane, bulldozer)

Traffic lights
One set of three
With pedestrian light(s)
With interrupt
Both ways with pedestrian lights
With interrupt
Sensing traffic on a minor road

Barrier
Light sequence and buzzer
Lifting or swinging
With sensors to activate or stop

Alarm/Trap
Sensors to activate

Useful topics which allow for sequence of control technology activities

Fairground Rides
Automated Kitchen
Automated factory processes
Kinetic Art
Automated Greenhouse
Building Site machinery
Automated Farm
'Home helps' for the disabled
Home security system

Reviews

SuperSpell – *4Mation*

'. . . to help your child or student to become a Super Speller.'

Reviewed by: C.J. Warner – University of Derby

Price: £37.54 (inc VAT)
Platform: PC, Mac or Arc
Key Stage: 2

The program is packaged on three 3½" discs and includes instruction manual, User Guide and sample student worksheets/diagnostic tests.

This is a fairly comprehensive package to test a child's ability in spelling and can be used to diagnose problem areas, for example speed of recall, structure patterns etc.

The words are categorised in a complex way and this includes blends, plurals, suffixes, homophones and commonly misspelt words.

Word Memory

This activity uses the LOOK, COVER WRITE and CHECK method.

Here the child is shown a word from the 'teacher chosen' list, asked to look at it, click when ready, then asked to type in the word either on the keyboard or by clicking on a screen display of the alphabet. A very pedestrian approach is adopted in the progression of difficulty – I am sure 'Wayne' would agree if asked about this!

A tally is kept of the number of words the child has attempted, the success score and the number of attempts the child has had, as a percentage.

Word Speed

An identical approach to that used in *Word Memory* but this time with the challenge of the child being asked to work against a pre-decided time limit, say 10 seconds for each word. A tally is kept of the results, as in *Word Memory*.

Word Splash

This is a traditional, good fun, Hangman-type activity which challenges the child to use established word structures to solve the letter composition for each word. Great fun!

Rocket

A supplementary activity to *Word Splash.* A novel variation on the theme of Hangman. The child has to decide the letters which compose a given word.

In both *Word Splash* and *Rocket* the teacher can change or select the word list to focus on a particular blend or digraph.

Word Find

This is an activity using a complex form of a word search. The words are displayed to read in all directions, except diagonally backwards. This is a very challenging activity which may well only be fully useful with older or more advanced children. Great fun though, if frustration doesn't set in first!

Additionally there is the facility to create or edit the word lists making it possible to 'tailor-make' lists to support particular topics, activities or visits etc.

A very useful program to be used sparingly as part of a structured approach to spelling strategy. The *Word Find* will usefully occupy a place as a supplementary activity in any topic-based project.

Speaking Starspell CD-Rom – *Fisher Marriott*

Reviewed by: Kathy Weston – HND Student (Early Childhood Studies) Hereford

Price: £42.50; additional discs £17.00
Key Stage: 2

The software was used with children from Year 3, Year 4 and Year 5, of varying ability and working in pairs.

All children were able to find their way into the program with ease and chose various categories which they felt to be suitable for them.

There is an excellent variety of words which meant that all of the children could be challenged. The categories are divided into:

Early Practice
Single letter sounds
Compound letter sounds
Single letter sounds altered by others
Silent letters
Changes before endings

Prefixes and suffixes
Other spelling patterns
Lists with themes

Many of the categories are further divided into various letter patterns, some of which are:

words using magic 'e'
words where 'ou' sounds 'u'
words where 'gh' sounds 'f'

These look a little confusing on the menu to begin with but the children soon realised what they meant.

Some of the children had had previous experience of *Starspell* without voice. The voice was felt to make the activity more interesting and enjoyable. Where the children had difficulty in finding the letter on the keyboard and maybe losing concentration, they simply pressed the 'ear' picture and the voice sounded the word again, as many times as necessary. This is very useful, as is the small picture showing the object being spelt.

The use of different colours for letters which are placed incorrectly and a further different colour for letters which did not appear in the first spelling attempt, is also helpful.

The computer being used was sited in a busy hallway which meant that the 'voice' was difficult to hear. The sound control was at a maximum but maybe a higher sound output would be beneficial. Ear-phones were used which helped this situation.

The children were able to print-out their 'results' after each category showing words which needed attention. When all were correct the screen shows the words:

'All words OK'

The children themselves felt that this should be something more complimentary like: 'All words correct – Well done.' The print-out provides the scope for children to carry out spelling tests independently, giving themselves and the teacher a record of achievements.

The *Speaking Starspell* program combines the successful way of teaching spelling (look, cover, remember, write, check), with IT and keyboard skills. The way in which it categorises the words into letter patterns will hopefully enable the children to recognise such patterns and apply these rules in other contexts. (National Curriculum Key Stage 2).

It is felt that the factors mentioned, together with the 'voice', results in a very worthwhile and enjoyable learning experience for the children, thus making *Speaking Starspell* a valuable addition to the school's collection of software.

Spellbank – *Semerc*

Reviewed by: Emma Brown – Buckingham Middle School

Price:	Single User	£25
	Site Licence	£50
Platform:	Acorn	
Key stage:	2/3	

This is a spelling aid for children. It is an on screen dictionary which can be used alongside a wordprocessor. When the children are stuck on how to spell a word they can type it into the spellbank. *Spellbank* provides a list of possible correct spellings; the child clicks on the correct spelling and then on 'insert' to add it into the text. The words offered are generally a good match and most of the time the word the children wanted was available.

Specific spelling banks can be built up for individual children and topics. There was some scope here for working collaboratively with the children to make these. It gave the opportunity to discuss spelling, to talk about words which may be a problem generally and words which may be a problem related to a certain topic. Working this way meant that some more adventurous words could be put in the spellbank to help extend the child's vocabulary. Unfortunately lists of words can be somewhat daunting to some children and there is no way around this with this particular program.

This work was mainly carried out with special needs children, although if I continued using it I would use it with more able children, as this particular spelling program is not the best for supporting children with special needs.

On the whole neither I nor the children found this product particularly easy to use and unfortunately I got little help from the Semerc helpline. The main disadvantages to this program are:

- That it is not an integral spell checker, which means that children have to realise they do not know how to spell the word and then look it up using spellbank.
- That the wordbanks are difficult to read for special needs children for whom generally this type of software is seen as helpful.

Words from the spellbank can be spoken which helps to some degree.

The individual wordbank facility was the most useful part of the program.

Some children have continued to used spellbank independently but most have returned to using the computer's spell checker.

Drawfile clip art collections

Reviewed by: Bob Fox – Worcester College of HE

The following article should be of interest to every teacher who uses an Acorn Archimedes-series computer. The vector graphics program *!Draw,* which is supplied with the machine, is far more powerful than many users realise. This review concerns drawfile clip art, which can be imported into virtually any wordprocessor, desktop publishing or multimedia package, or which can be used within *!Draw* itself for a wide range of design purposes.

In *MICRO-SCOPE* 49 I described the basic idea of vector graphics, and set out seven principles by which I think drawfile clip art should be judged. Briefly, these were:

1. Images should be recognisable.
2. Images should be appropriate for their intended audience.
3. When opened on screen, images should be sized so that they are immediately entirely visible.
4. Images should be saved as grouped objects.
5. When ungrouped, images should where possible divide into sensible sub-groups.

6. Text in an image should be in a standard font, or else converted to a path.
7. The image should not be over-complicated.

Clip art collections which were originally created as drawfiles are far more likely to comply with these principles than images which have been converted from a different platform.

A wide selection of discs on specific topics is available from SEMERC, under the general series heading *Just Pictures* (£14 each; some discs are of bitmapped images or sprites, and some contain a mixture of sprites and drawfiles). The range of topics is highly suitable for primary school use, and the images are well produced and comply with most of the above principles. I sometimes find that they are over-fussy for my purposes – the Roman centurion or the Victorian lady have a whole range of undergarments, which is fine if I am doing a project on clothes, but rather tedious otherwise, as they do a sort of reverse-striptease every time I move the image, which can make them very slow on older machines.

The *SEMERC Treasure Chest CD-Rom* includes a considerable number of the *Just Pictures* images, along with numerous sprites and sound files (including sprites from the MAPE *Into Europe* pack). It is a dual-format (Acorn and PC) CD-Rom, and, like virtually all SEMERC products, it is angled towards special needs users, though it can be used effectively in any primary or middle school context. To my mind it is rather over-priced at £69, though many schools will have received it free under a DFEE scheme a couple of years ago, and if you own the CD-Rom you have a site licence, and can freely copy the images within your school. You could, therefore, make up floppies for individual topic areas, which would save you having to delve through the whole hypermedia structure of the disc every time you wanted an image. For myself, I would rather have all the *Just Pictures* packs on one CD-Rom, in a hierarchically structured directory system.

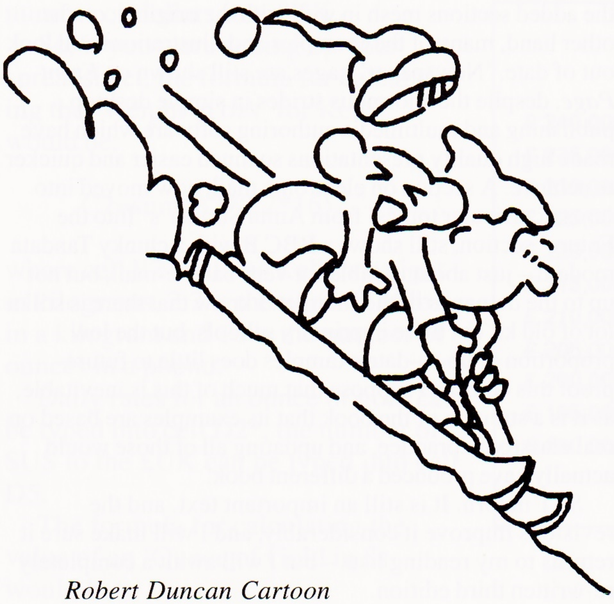
The *Topic Art CD-Rom* from Desktop Projects Ltd. is exactly that – a compilation of what started out as floppy discs of drawfiles on well-known primary school topics. Individual discs are still available at £8 each, and the CD-Rom is a mere £20; both prices include a site licence. Again, the CD-Rom is dual-format, and the images are present in their original drawfile format, and have also been converted into *ArtWorks* files and Corel EPS files. Because they started out as drawfiles, they comply quite well with the principles set out above. Images are appropriately grouped, and many take apart into logical sections. Acorn users can take advantage of the !Thumbnail viewer to preview pictures (though the version I have does not appear to be compatible with my StrongArm processor). There are over 2000 images, and their quality varies from some rather weedily thin outlines to a number of quite superbly detailed and accurate renditions of farm animals, dinosaurs, insects, etc.. Some topic areas are perhaps of marginal use (whole sets of road signs, or playing cards), and some headings promise much but deliver very few images. History is represented only through costume. I find the faces on the human figures slightly odd – some of the proportions look a bit strange and the poses very uncomfortable. There is a large Xmas section, including a whole lot of cards which look a bit like those 30-for-75p selection-box cards that children give their teachers – you have been warned! On balance, though you need to be slightly selective, I think this represents excellent value for money.

The Sherston Clip Art CD Collection began as a set of topic-based discs from DEC_dATA. Again it is dual-format; Acorn files are mostly drawfiles, and PC files are mostly in CGM format. The architecture section contains some high quality photographic images of buildings, in sprite or JPEG format. There are over 2300 Acorn files on the disc, which costs £49.95 for a site licence copy. Most images are stored as simple black-and-white outlines and also in colour, so you can choose whichever is appropriate for your present purpose. The Clearview browser is quick and efficient, and shows you a thumbnail sketch of each image, accompanied by some descriptive text (this is sometimes unintentionally funny – how do you describe very well-known things, e.g. 'bird'?). The overall standard of artistry is well-matched to most primary school uses – good, and not over-fussy. Topic areas are fairly obvious (animals, history, my life, technology, transport, maps, people, etc.); there are some superb renditions of bits of the Bayeux Tapestry; an excellent set of coins (ideal for making money worksheets or *My World* screens); a comprehensive and up-to-date set of maps; and one or two appallingly inaccurate images (e.g. the recorder in the MyLife/Music section, which definitely would not be playable). Images are sensibly grouped, though sub-groups are not always carefully organised. I think this is one of the most useful CD-Roms I have at present.

Sherston recorder

Logotron have taken over the distribution of the *Bitfolio 7* CD-Rom (single format, either Acorn or PC or Mac, price £38.29). This is a huge collection of 10,000 images, complete with a printed 266-page manual displaying all of them, which is actually much quicker and easier to use than a thumbnail browser. Though the CD-Rom was not originally specifically aimed at the education market, its scope **is** awesome: there are innumerable borders and corners, many of which could well be useful, and a whole range of topic areas, many of which will probably be of virtually no use at all in a classroom context. The quality of images varies. In my view, it suffers from one major defect: all or most of the files did not originate in *!Draw* format, and porting them across from something else has lost some of the drawfile flexibility. Though images are grouped, sub-groups rarely work effectively. The software that made many of the conversions obviously cannot handle Bezier curves, so curves are in fact made up of a large series of short straight lines. This can have serious consequences for memory consumption, as files are often several times larger than they need to be. Having made those criticisms, however, I am still quite fond of this CD-Rom, and many times it has come to my rescue when other sources have failed.

One of the more charming aspects of the *Bitfolio* CD-Rom is the collection of cartoons by Robert Duncan, which have all the appeal of an expensive birthday card



Robert Duncan Cartoon

(and could potentially save you a fortune. . .). Logotron also distribute a CD-Rom entirely of Duncan's work (*The Robert Duncan Cartoon Kit*, single format, Acorn, PC or Mac, £29.78). Each image is stored in three different ways, in black-and-white, spot colour and full colour. Though again it is not specifically aimed at education, it contains enough funny animals and cute kids to justify its place in the classroom. The Acorn version suffers from exactly the same problems as *Bitfolio 7*, however, with images having been ported from a different platform. The introduction in the manual says you can do things like swap characters' heads, but on the Acorn version you can't, because of the way the conversion has linked paths into single units. This is a great shame, as it represents a missed opportunity to have fun and develop new IT skills simultaneously.

Having spent ages sifting through thousands of Public Domain clip art images, I had high hopes of the *Zenta Clip Art Collection* CD-Rom (£29.95, Acorn only), which also has 10,000 images covering a wide range of topic areas, not all of which are of use in the primary classroom. As the images come from a wide variety of sources it is difficult to generalise about them. Some are very well made, and others are awful. Many are not grouped at all, so when you try to move or re-size them they fall apart. A large proportion did not start out as drawfiles, and do not behave like drawfiles when you try to manipulate them. Files originated in many places, and there is a strongly American bias in some sections. The whole 'Education' directory is ghastly, and I really cannot imagine ever actually using any of the images in it.

Schoolhouse from the Zenta 'Education' directory

The EasyClip viewer, supplied on the disc, is rather tedious in operation. Overall, it is the quality of the images that depresses me most. I suppose at more than three images per penny I should not complain, and there is good material here, but the need for sifting has not been diminished.

If I were a strapped-for-cash school, and could afford only one of the above, I think on balance I would opt for the *Sherston Collection.*

Libraries of the Future – NCET

Reviewed by: Les Watson

It's not surprising that IT used to be about technology. In the early days of educational IT computers were so puny in terms of processing power and memory that handling information in any real sense was virtually impossible.

The emphasis in the late 90s, however, is clearly on the information component of IT, so much so that having information to communicate has changed the acronym to ICT. This change of focus has significant implications for traditional information brokers such as librarians. *Libraries of the Future*, which was a joint NCET, British Library, Department of Education Northern Ireland project, provides some insight into the changing role of School and College libraries and librarians. One outcome of the project is the *Libraries of the Future* pack which consists of the project report, a staff development pack, and a supporting video.

The main aim of the project was to develop a realistic vision of 'libraries' of the future. The project was divided into two phases. Phase one provided a multimedia computer, collection of CD-Roms, and an Internet connection to the participating schools, and phase two collected materials which focused on the management of resources and development of learner skills. Whilst the project report makes interesting reading, and has recommendations for a range of individuals and agencies I suspect that it will be the staff development pack and video that most schools find useful. These materials focus on three areas:

developing learners' skills
managing resources
staffing issues

The pack provides a range of questions for discussion and illustrates some approaches to answering these through the printed materials and the video. What the materials make clear is that the school library has a key role to play, not just as provider of information, but as an active participant in developing the school's approach to learning. A vision of the library of the future is given at the start of the pack which looks forward to a time when electronic communications are ubiquitous and cheap enabling a connected community involving school and home in information provision and use. Any School or College reviewing its provision and use of the library will find the whole *Libraries of the Future* pack to be a useful source of information and activities.

The whole pack (report, staff development materials, and video) costs £25.45. Items can be purchased separately as follows: Libraries of the Future final report £10, Staff development pack £12.50, and video £9.95.

Children Using Computers (2nd Edition) – Anita Straker and Heather Govier (Nash Pollock Publishing)

Reviewed by: Bob Fox, Worcester College of HE

Those of us who have observed the rise of primary IT over the last fifteen years or so have a lot to thank Anita Straker for. There was a point in the eighties when educational software could have become largely a matter of drill-and-practice programs dressed up as glitzy arcade games, high on whizz-kiddery and low on pedagogical relevance. The situation was improved by the appearance of a wide range of short, simple programs by Anita Straker, which gave children scope to develop their thinking, mostly in a mathematical context. What they might have lacked in glamour they made up for in pedagogical relevance.

As with software, so with the first edition of *Children Using Computers* in 1989. Its underlying perspectives were right, and the content felt largely unthreatening to the IT timid reader. It was on my reading lists for students for years, but I was starting to find it a bit embarrassing, because, though the content and theoretical position were admirable, the examples were looking dated. The technology has moved on a long way since 1989, and the pedagogy has developed in the light of what has become possible We now take it for granted that a word processor will be WYSIWYG; we are now more comfortable with windows and mice than we would be typing in command lines; and increases in speed and storage capacity have meant that our imaginations need not be limited by the machine's capacity; and we are beginning to treat new developments like CD-Rom and the Internet as routine and commonplace. So when *Children Using Computers* went out of print I was not particularly sorry to see it go, though I had nothing in mind with which to replace it.

I was delighted to discover that Heather Govier was working on a revised edition, updating references, adding sections on CD-Rom and so forth, and I awaited its publication with anticipation. Now I have it, I am in two minds. On the one hand, the pedagogy is still correct, and the added sections mesh in well with the original; on the other hand, many of the examples and illustrations still look out of date. 'Newspaper' pages are still shown on *Front Page*, despite the enormous strides in simple desktop publishing and multimedia authoring software which have made high quality presentations so much easier and quicker to achieve. A section on electronic mail, now moved into 'cross-curricular topics' from Anita Straker's 'Into the Future' section, still shows a BBC B with a clunky Tandata modem – just about useable for very basic e-mail, but not up to the demands of the Internet. I know that there is still a lot of old kit out there in primary schools, but the low proportion of up-to-date examples does little to future-proof this edition. I suppose that much of this is inevitable, as it is a strength of the book that its examples are based on real classroom practice, and updating all of those would actually have produced a different book.

So I'm torn. It is still an important text, and the revisions improve it considerably, and I will make sure it returns to my reading lists – but I will await a completely re-written third edition.

References

All quoted prices are ex-VAT.

4Mation, 14 Castle Park Road, Barnstaple, Devon EX32 8PA; Tel: 01271 25353; Fax: 01271 22974

Desktop Projects Ltd., Unit 2A, Heapriding Business Park, Ford St., Stockport, Cheshire SK3 0BT; Tel: 0161 474 0778

Fisher-Marriott Software, 3 Grove Road, Ansty, Warwickshire CV7 9JD; Tel: 01203 616325

Logotron, 124 Cambridge Science Park, Milton Road, Cambridge CB4 4ZS; Tel: 01223 425558

NCET, Milburn Hill Road, Science Park, Coventry, CV4 7JJ; Tel: 01203 416669

SEMERC, 1 Broadbent Road, Watersheddings, Oldham OL1 4LB; Tel: 0161 627 4469

Sherston Software Ltd., Angel House, Sherston, Malmesbury, Wilts. SN16 0LH; Tel: 01666 840433

Zenta Multimedia, 10 Ravenhurst Drive, Birmingham B43 7RS; Tel: 0121 358 3054

Worth your weight in gold?

Janice Staines
Senior Programme Officer, NCET

How many times have you heard someone say, 'You're worth your weight in gold!' This usually means that they are grateful for a kindness or favour you have done for them. But what does it actually mean? How much would you be worth if you were given as much gold as your own weight? This is an activity you might like to undertake with the children in your class but you will need to bear in mind that some children are very sensitive about their weight.

This investigation will involve some quite complicated calculations, so it would be advisable to use a spreadsheet to help out. You will need to be able to enter into the spreadsheet how much each child weighs. This is usually measured in kilograms, so the first calculation will have to change the child's weight into ounces (the price of gold is given per ounce!). Once the child's weight in ounces has been calculated this has then to be multiplied by the price of gold. Unfortunately, the price of gold is shown in $US and so to give the final value of each child you will need to divide that amount by the number of dollars in a £UK.

So, if you were setting up your spreadsheet, the formula for calculating the 'Weight in ozs' for Kelly would be:

C2=sum(B2*2.2*16)

where cell B2 contains Kelly's weight in kilograms, 2.2 is the number of lbs in a kilogram and 16 is the number of ounces in a pound.

Daily rates for an ounce of gold can be typed into cell D2*, the number of $US to the £UK can be typed into cell D5.

The formula for calculating the value of an 'Ounce of Gold in £s would be:

D8=sum(D2/D4)

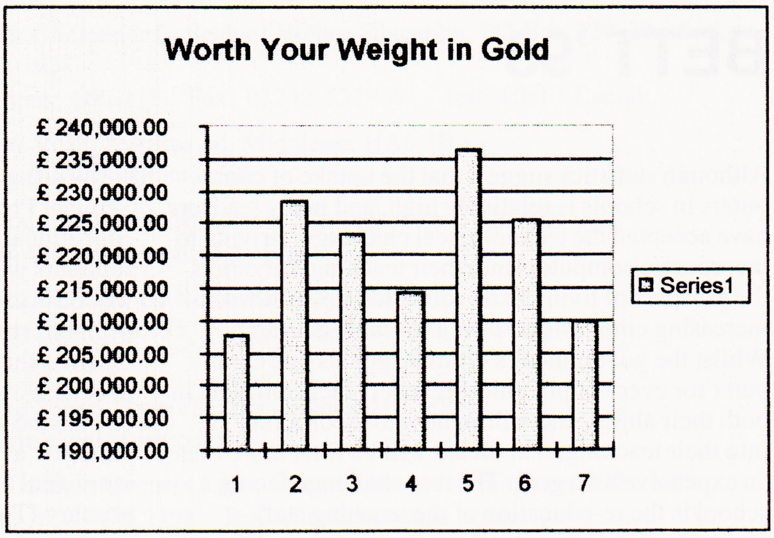
which is an 'Ounce of Gold in $s' divided by the number of '$s to £'.

The formula for calculating the value in £s for Kelly is:

E2=sum(C2*D8)

where C2 is Kelly's weight in ozs multiplied by (*) the value of an ounce of gold in £s.

Once you have calculated the formulae for one child, these can be copied for the other children in your class as shown below.



If you are looking for up-to-date values of gold they are listed in most newspapers or better still if you have access to a television with a teletext facility you can look the values up on that and get current market prices. The values are displayed on BBC 2 CEEFAX page 200 and on Channel 4 TELETEXT page 500. These same pages will also give you current value of the $US against the £UK.

Teletext is a very useful but often overlooked resource and it might be something you want to look at more closely – particularly if you are searching for real data for an Information Handling activity on say, The Weather. The pages also contain news items written for children, by children and these may be used to encourage children to discuss current affairs or to write their own electronic newspaper.

Name	Weight in KGs	Weight in OZs	Ounce of Gold in $s	Value in £s
Kelly	28.4	999.68	$ 340.90	£207,799.34
Simon	31.2	1,098.24		£228,286.60
Shui	30.5	1,073.60	$s to £	£223,164.78
Harjit	29.3	1,031.36	$ 1.64	£214,384.53
Jean-Paul	32.3	1,136.96		£236,335.16
Rapinder	30.8	1,084.16	Ounce of Gold in £s	£225,359.84
Faye	28.7	1,010.24	£207.87	£209,994.40

Drawing a graph of the values in £s will help the children see more clearly who would be worth the most/least. You might wish to extend the activity by asking whether the girls or boys in your class are worth most and if the answer would be the same for other classes.

The price of gold fluctuates on the world market, so another extension activity might be to monitor these changes over a period of time and see how they affect the values on your spreadsheet.

Just as the value of gold fluctuates on the world market so do other resources. Coffee, for example, has recently doubled in price because of bad harvests in the coffee growing regions of the world. So, instead of 'Worth your weight in gold' you might like to find out what your value would be if you were worth your weight in coffee, zinc, wheat . . . BBC 2 CEEFAX page 299 will point you in the right direction for finding these values.

BETT '98

Although statistics suggest that the uptake of computers in schools is relatively high, and many teachers have accepted the technological challenge, striving to incorporate computers into their teaching, for others the prospect of living in an educational world with increasing emphasis on IT is extremely daunting. Whilst the government's ultimate goal is one computer for every pupil, unless teachers feel confident in both their ability and willingness to incorporate IT into their teaching, that dream will be little more than an expensive own goal. The real challenge facing a school is the re-education of the teaching staff – preparing and arming teachers for the future. With the debate on raising standards in the classroom still raging on, it becomes increasingly clear that IT has a major part to play. More importantly, the place of the BETT Show becomes crucial in the education of the teaching profession.

The BETT Show takes place at Olympia, London from 14th–17th January 1998 and MAPE members will be delighted to hear that primary education is once again high on the agenda. Over 15,500 educationalists are expected to attend the world's leading IT event for education, and once there will discover the very latest developments in IT.

Whatever your role in education, your needs will be specifically catered for in the supporting BETT Seminar Programme – the most comprehensive educational IT seminar programme ever seen. All seminars will be presented by experts in their field who will be discussing the most pertinent issues of the day in an informative and practical manner.

The exhibition will play host to the largest gathering of educational IT suppliers ever assembled. Experts will be on hand to demonstrate literally everything that is currently available for schools, colleges and the individual classrooms. Many companies specialising in primary IT will be on hand to explain the very best IT solutions for the classroom, highlighting how these technologies can be incorporated into teaching and how the quality of learning will be enhanced as a result.

The BETT Show is relevant to everybody working in the education market and a visit would make a valuable contribution to a teacher's INSET programme. For FREE tickets and further information, telephone the Ticket Hotline on Tel: 0181 240 5051. For details of the BETT Seminar Programme dial the Seminar Fax Line on 0336 423440*. For full details check out the BETT Web Site at http://www.education-net.co.uk

*Calls will be charged at 50p (per minute) at all times.

MICRO-SCOPE matters

Rhona Dick
Editor

I wonder how many people who read the first issue of *MICRO-SCOPE* all those years ago could have visualised the extent to which IT would permeate so many aspects of our teaching. I have to admit to being one of those who regarded the arrival of the BBC B in my classroom as a case of 'money that could have been better spent on books.' I know I am not alone. A colleague in MAPE was even more sceptical than I. Sadly I suspect that there are still teachers who, for whatever reason, covertly hold that view. Does MAPE have anything to offer them? I hope so. The stated aim of MAPE is to

> 'advance education by promoting and developing the awareness and effective use of computers as an integral part of the philosophy and practice of primary education.'

MAPE is not just an organisation for the committed and confident IT co-ordinator; it is there to support and inform everyone.

I'm delighted that this issue of *MICRO-SCOPE* is packed with many articles from classroom teachers and students. Coincidentally, several are concerned with control technology and floor robots. It seemed appropriate that the IT activities in the centrefold should also be devoted to floor turtles, with something for every age group from the Nursery to upper Key Stage 2. I am indebted to many teachers who have offered their ideas.

The question of managing resources seems to have been much to the fore recently, and Elizabeth Furness and T.G. Pearce detail their models for effective use of IT resources in their schools. Martin Blows offers some timely advice to schools who are considering putting all their technological 'eggs' in one basket.

So *MICRO-SCOPE* has reached 50, and hardly seems to have aged at all. Perhaps it is time for a change, a new image. Whatever the future may hold we still want to celebrate and encourage the good IT practice in our schools – that will not change.

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50

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