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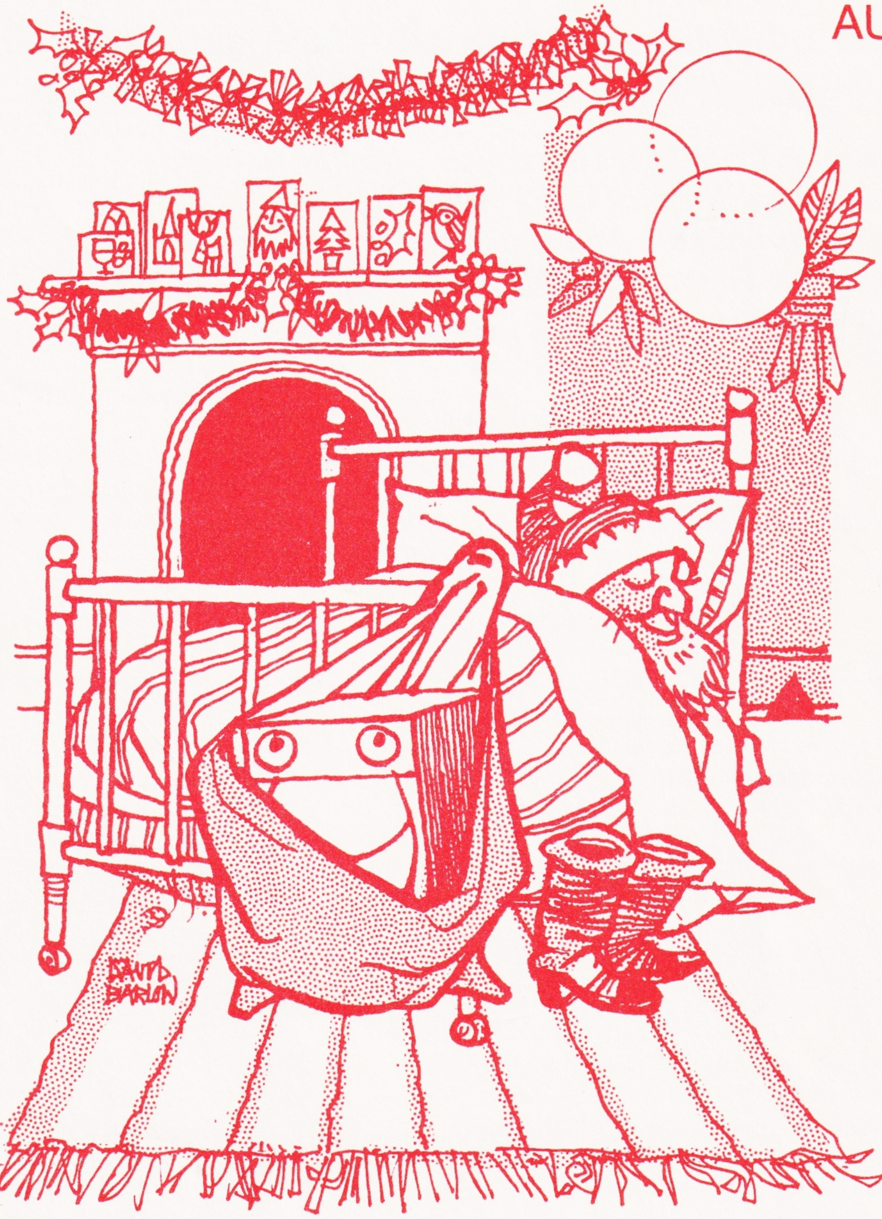

Nimbus Nursery

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***Wordplay* Revisited**

Software to Look At

Data Handling in an Infant Classroom

Evidence to the Design and Technology Working Group

NEWMAN COLLEGE WITH MAPE

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Paint, water play, sand. Jig-saws, dressing up and the Nimbus

Jenny Whitehouse
Chandos Nursery, Highgate, Birmingham

'Tyron – you've fallen off the screen again'.
'What?'
'Your arrow's fallen into the boxes!'
'Oh.'
'Click on the right one. See. I told you, your arrow wasn't in the right place. Now change colour. Go on. Now change your brush'.

This conversation is taking place between two four year-olds. One is instructing the other in the correct use of the program *Paintpot*.

The concentration is intense, as James and Tyron, two of the nursery's most boisterous boys, sit in front of the RM Nimbus, which I regard as a complicated piece of equipment. They do not think it is complicated. It is just another nursery activity – like painting, water and sand play, jigsaws and dressing-up. Every minute of every nursery day, the Nimbus is in constant use.

I came to Chandos Nursery, tucked away in Highgate, in September 1987 and heard that the school was awaiting the arrival of a Nimbus. During '87, I had been fortunate in gaining 'hands-on' experience of the 480Z, Nimbus and the BBC micro, thanks to the patient instruction of Lesley Walker, a former colleague now on secondment to Birmingham Educational Computing Centre and a member of the Nursery Computing Project team. She has instilled in me enthusiasm for the use of the computer in early years education, and convinced me (someone who does not change a plug without the wiring diagram in front of her!) that I am perfectly capable of using it. More than that, neither I, nor my lively four year-old son, could break it!

This is the basic principle I have kept in mind when introducing the Nimbus to our 67 four year-olds.

During October half-term, I was lucky to have the use of a Nimbus and become *au fait* with all the programs available (thank you BECC). So after Christmas I set up our new machine within my working area.

'What's that, Mrs Whitehouse?'
'It's a computer.'
'Oh, can I have a go?'
'Yes, but be gentle.'
We were off!

The children grasped the use of the mouse quickly and with a confidence that still amazes me. I would instruct one or two and, like setting a match to a gunpowder trail, instructions were passed from one child to another; from each session to the next.

At first I used *Paintpot*, which enables children to create the most dazzling patterns using full hand/eye co-ordination, manual dexterity and fine motor control. All this *and it was fun!* The co-operation between the two at the machine (and the three or four capacity audience), was also admirable. During the first few days, demand was great and I based myself near to the machine. As the children realised that it was always there, demand became steady as with any other nursery activity.

Since then I have introduced *Point* with great success. Watching these children, after only a few weeks with the machine, their development can clearly be seen – both in dexterity and in confidence! *Collage* offers endless possibilities which I haven't yet had enought time to explore. The nursery day is very full!

During quiet time on the carpet, we discuss the few do's and don'ts. We *never* try to take discs out and we *wait* while the red light is on and the machine is 'chuntering'.

'Who can tell me what the red light means?'

'It means WAIT. I'm doing something for you.'

It has to be said that the aforementioned Tyron has a fascination for touching the eject button which is tantalising at his eye level. This once resulted in the complete wiping of the *Paintpot* disc!

All the staff of the nursery have used the Nimbus and the fact that it remained in constant use during a week when I was absent from school, is a credit to its appeal. The nursery nurse I work with had set it all up each day, with complete confidence, as she would with any other nursery activity.

At three o'clock, when the children are in their story rooms, you may well catch a mum or dad 'having a go!'

'Isn't it wonderful?'

'I wish I'd had one when I was at school.' This teacher is very glad there is one in hers.

The Birmingham Nursery Project set of programs will be available through MUSE later this year.

Data Handling in an Infant Classroom

Peter Brehaut
Guernsey Teachers' Centre

Whilst following a Certificate in Advanced Professional Studies Course, I decided to examine how a database would fit in with my usual cross-curricular approach to a project. The class were studying birds and I wanted to find a 'suitable' database which would enable the children to input information, search and graph the data whilst at the same time retaining 'user friendliness'.

Three databases were examined in depth:–

Grass by Newman College;
Find by Hummec;
Our Facts by Anita Straker.

All of these had a lot to offer but I decided to start off with *Our Facts* as this seemed to provide a concise introduction to using a database.

Our Facts has simple menus which are very straightforward to use and are devoid of jargon, thus enabling the children to come to terms with its facilities very quickly. Once the children have entered the database itself, on-screen prompts make the whole process of looking through records very simple indeed. The initial data collected arose as the result of observing birds in the school playground. This was recorded on a large class record sheet and within the database, once I had typed in the field names. Questions posed by a worksheet and then answered using the database proved an effective method of combining traditional methods with technology.

One interesting point that arose was that the children found routes to an answer in the most unexpected ways. Indeed, they were far more direct in their approach than several more experienced users who were made to feel very humble when taking twice as long to reach the same answer!

In order to record the routes a drive chart was devised to be used in conjunction with an associated questionnaire (see Fig. 1).

Using the printer gave the children a far more concrete perception of the data held in the computer and the graph making facility within the program enhanced the use of mathematical concepts. The next stage in the project was to apply the skills learned thus far to a more complex data-handling program and to transfer greater responsibility to the children.

Junior Find retains the user friendliness of *Our Facts* whilst at the same time offering further facilities such as more advanced searches. Again the children are able to select from on-screen menus using the Space Bar and Return. First of all the children decided on the field names they wished to use, drawing on their experiences to assist them. They found out extensive details about the birds they had observed, using the class library as a medium for their research. These details were put on to sheets which were photocopied so that each child could gradually build up a book which they illustrated. All the data was then put into

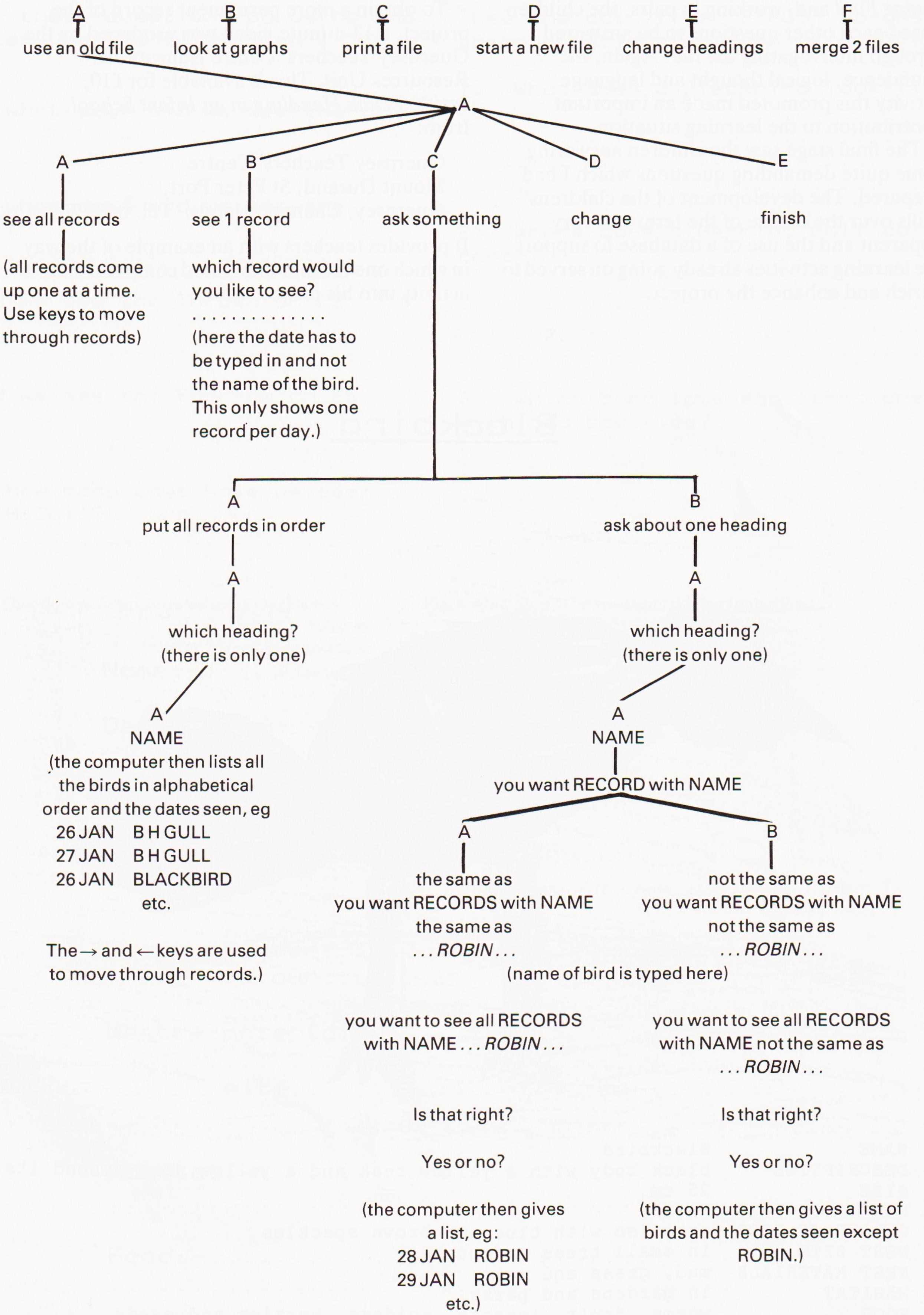


Fig. 1 Our Facts *drive chart.*

Junior Find and, working in pairs, the children posed each other questions to be answered through interrogating the file. Again, the confidence, logical thought and language activity this promoted made an important contribution to the learning situation.

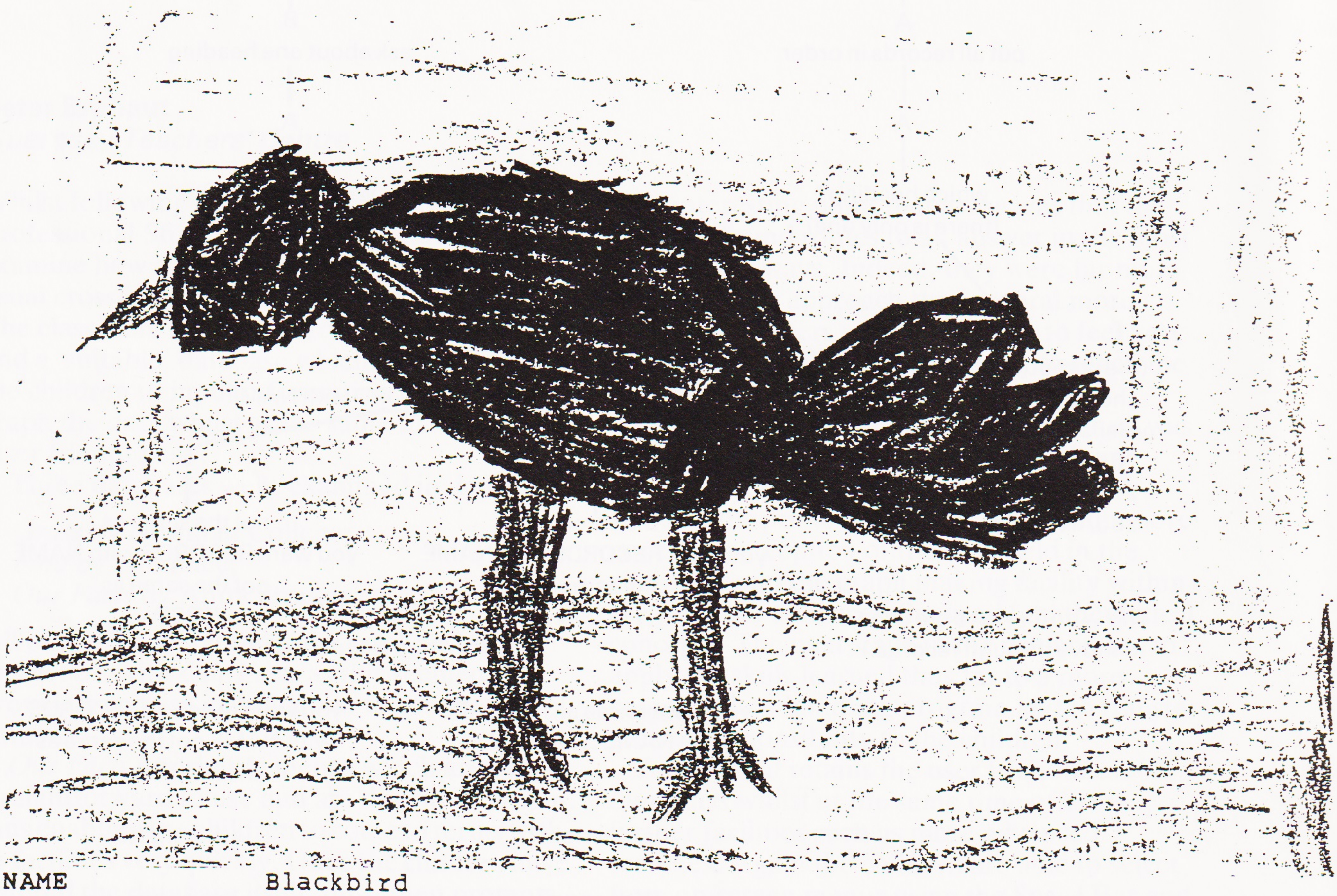
The final stage saw the children answering some quite demanding questions which I had prepared. The development of the childrens' skills over the course of the term was very apparent and the use of a database to support the learning activities already going on served to enrich and enhance the project.

To obtain a more permanent record of the project, a 13-minute video was produced by the Guernsey Teachers' Centre Educational Resources Unit. This is available for £10, entitled *Data Handling in an Infant School*, from:

Guernsey Teachers' Centre
Mount Durand, St Peter Port,
Guernsey, Channel Islands. Tel. 0481 20654

It provides teachers with an example of the way in which one teacher integrated computer-based activity into his project work.

Blackbird



NAME	Blackbird
DESCRIPTION	black body with a yellow beak and a yellow ring around its eye.
SIZE	25 cm.
NUMBER OF EGGS	3 - 5
COLOUR OF EGGS	greenish with blue and brown speckles.
NEST SITE	in small trees and bushes.
NEST MATERIALS	mud, grass and moss.
HABITAT	in gardens and parks.
FOOD	worms, fruit, insects, spiders, berries and seeds.

Fig. 2 *Sample printout with Child's illustration.*

Answer these questions by using the computer.Use the file "Seen".

1> On what days did we see the Dove?

....

2> On what days did we see the Bluetit?

....

3> Did we see the Thrush on 29 Jan?

....

4> Did we see the Sparrow on 29 Jan?

....

5> On how many days have we seen the B H Gull?

....

Fig. 3 *Questions to be investigated using* OurFacts.

Use the data file "BIRDS" to answer these questions.

1> What does a Blackbird look like?

....
....
....

2> Where does a Herring Gull build its nest?

....
....
....

3> Which bird lays eggs that are white with red speckles?

....
....
....

Fig. 4 *Questions to be investigated using* Junior Find.

Name:-......................

Description:-..................
....
....
....
....

Size:-..................

Eggs:- number..................
colour..................

Nest:- materials..................
....
site..................
....

Habitat:-..................
....

Food:-..................
....
....

Fig. 5 *Data collection sheet for* Junior Find.

Who Should Write the Software?

Les Watson
College of St Paul & St Mary, Cheltenham

Well, who do you think should? – programmers, of course! If we modify the question to ask 'Who should write educational software?', then the answer is not so easy. Programmers know a great deal about microcomputers, and can make them do clever things, but what do they know about children's learning? To take this 'problem' into account perhaps teachers should be involved somewhere in the production of a program, since they know something about children and how they learn. In fact most of the best educational software around comes from people who have sound classroom experience and programming knowhow (or control of a 'tame' programmer), e.g. Anita Straker (National Primary Project), Mike Matson/Neil Souch (4Mation Software), Brian Richardson (Cambridgeshire Software House), and *Resource*. Another solution to the 'problem' is to provide teachers with software tools which allow them to express their ideas as 'programs', but which require neither programming knowledge nor computer expertise.

During 1987 I worked in Randwick Primary School, Stroud, Gloucestershire, using examples of such tools with a class of seven- and eight-year-old children. Software of this type is known variously as Knowledge Based Software, Software Shells, Software Toolkits, and Authoring Software. The authoring shells I have been using are written in MicroProlog, but don't let that put you off – to use them the only language you need to be conversant with is English! Working with Bill Tocknell, the Head of the school, I tried to make the micro the slave of the curriculum. Bill decided what topics he was going to cover as part of his humanities/project work and we then discussed how we could use the micro to enhance the work. Most of the topics were in fact those covered by the BBC schools programme *Zig Zag*. During the year we looked at aspects of Eskimo life, Building the Canadian Pacific Railway, the North American Gold Rush, the Crusades, and the Vikings. In all of these topics computer-based materials were produced to support and enhance the learning taking place.

I used two authoring shells, *Detect*, which is a detective database writer, and *Linx*, which is a simulations writer (the new version of which has a database attached so that children can look up information as they use the simulation). For the initial work in school we used *Linx*. With this, the teacher can write a piece of text to describe a scenario/location and link this to other scenarios/locations either directly or by providing choices. Thus a simulation can be devised in which the user progresses directly from one 'scene' to another or takes a certain path by making choices. An additional feature is that the computer remembers each choice and subsequent decisions can be affected by earlier choices.

In our first topic 'Life as an Eskimo', we used the software in a variety of ways. As an introduction, a sort of mini 'expert system' was written in which the children used the computer to go through the process of building an igloo! They were faced with decisions about where to build it, what type of snow to use, how to start it off, where to put the window, etc, and attempted to progress through the program and complete a habitable igloo. This worked quite well and provided opportunities for discussions about hot air rising, predators gaining access to the igloo, and the usefulness of different types of snow for different purposes!

I don't want children to regard computers as machines that are really very clever and know much more than people, so after this initial use of the software I was determined to show them the 'insides' of a similar program and perhaps get them to write their own. I wanted to put them into the driving seat and to make sure that they realised that the computer was only as clever as the person who put in the information in the first place. To this end I wrote a simple branching story about the old Eskimo and his lost dog, with choices such as 'Will you help him?'. There were deliberately few locations in the story, and I included only simple two-way choices. After using the simulation I showed the children a written plan of the story, with the text at each location in a box and arrows showing the possible choices, e.g.

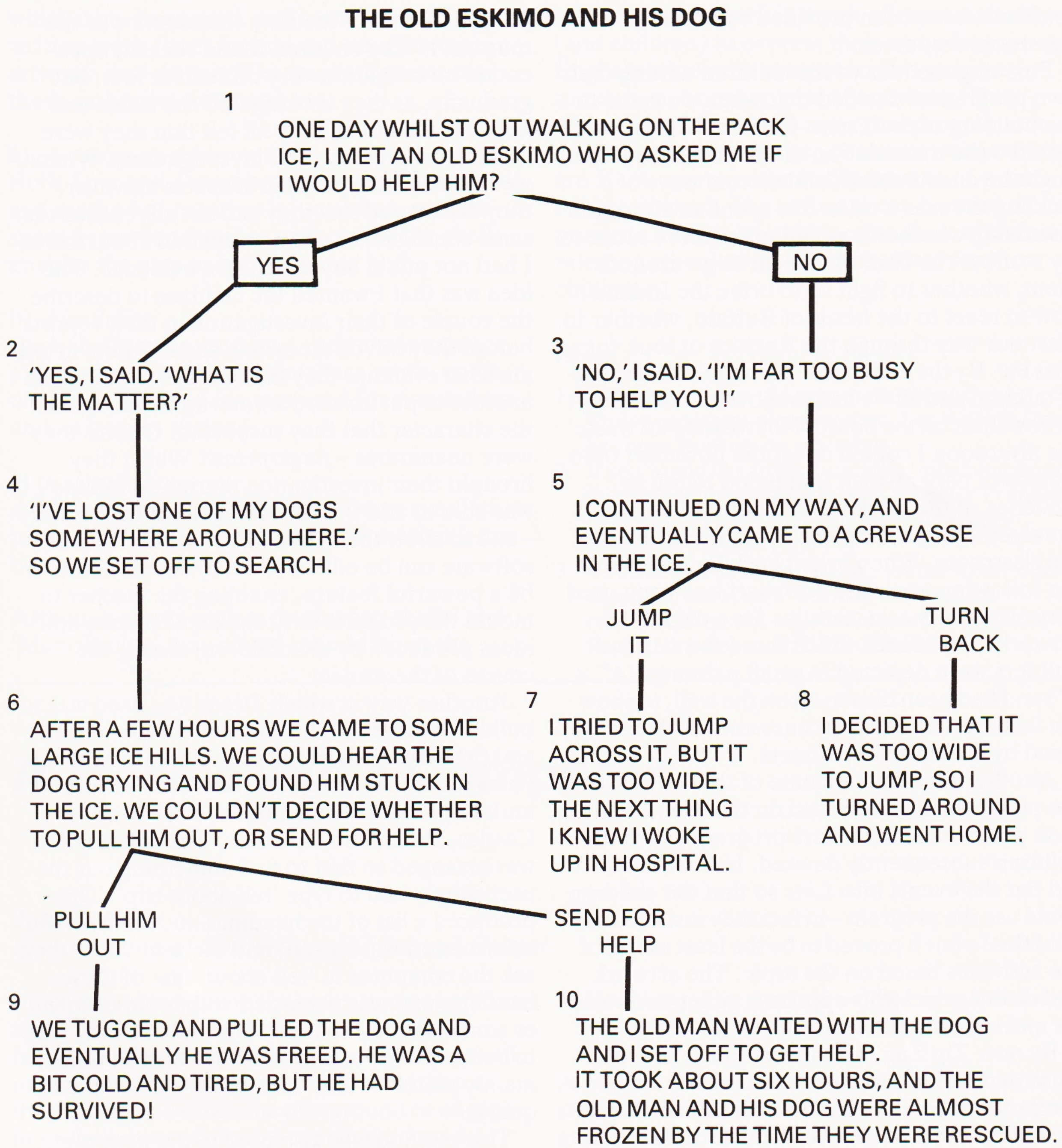


Fig. 1 *Example story showing available choices.*

We then decided that the children would write some stories involving choices for typing into the shell so that they, and more importantly others, could explore the situations. We wanted to encourage them to write in a way that was new to them. The stories that they usually write have only one outcome, hence thinking of more than one possible result was a real test of the imagination for some of the class. They all managed to produce a plan of a short story which we typed in and which they enjoyed using. The process of planning, and the discussion leading to the end product, involved the children in creative thinking of a type which they had not previously encountered.

Continuing with the Eskimo theme Bill Tocknell spent some time planning out a full-scale simulation of life as an Eskimo. This involved many of the problems faced by Eskimos living in the traditional lifestyle. It was typed into *Linx*. The children worked in small groups of two or three. Each group kept a diary of their experiences and the consequences of their decisions, and learned what Eskimo life is like. Admittedly, this was a somewhat remote experience, but it was nonetheless one which could not have been provided by other classroom resources.

Pursuing the idea of the children writing their own programs I decided that when we came to the building of the Trans–Canada Railway we would write a simulation of the problems which might be encountered, and discuss ways of tackling them as a class. We spent an afternoon discussing whether it would make more sense to try to cross the Great Lakes or to go around them, whether to fight or to bribe the Indians, how to react to the herds of Buffalo, whether to blast our way through the Rockies or look for a pass etc. By the end of the day we had done a lot of talking, and all we had to show for it was a sort of flowchart on the board! Not wishing to 'waste' the afternoon I copied down the flowchart onto a piece of paper which I intended to use as evidence of the work we had done. Being my usual self I forgot the piece of paper and left it in the classroom. When I went back for the session the following week the flowchart had been used very effectively as a stimulus for a display of artwork. The scenes which faced the railroad builders were depicted in small paintings (4″ × 4″) and had been displayed on the wall, to show the links between these scenes and the decisions faced by the railroad pioneers.

Another pleasing outcome of this work was the plays which were based on the events which took place in the flowchart-program which the children subsequently devised. Incidentally, I did put the events into *Linx* so that the children could use the program – in fact they insisted that I did this! – but it proved to be the least useful of the activities based on the topic. The artwork and drama which this approach generated were far more profitable.

By now Zig Zag had moved on to the Gold Rush and Bill felt that he would like the computer to give the children a real feel for the lifestyle of the time. We could have done this by writing another *Linx* simulation, but I decided that was probably too easy a way out! The outcome was that we decided to use the other authoring shell available to us, *Detect*. After carefully selecting appropriate names from the Zig Zag book we used the shell to produce a murder mystery for the children to attempt to solve. The murder was based in Dawson City. The Ping Pong Kid had apparently struck it rich and, on his return to Dawson City, had his gold weighed out by Soapy Smith the barman at the Lucky Strike Hotel. Later the Kid was found dead outside the Hotel! Who had committed the crime? The program allows the children to ask about people and places using the 'tell about' command, to 'search' places, and to 'interview' people. Which of the nine characters was the murderer? The children found such an open-ended investigation very difficult at first, but gradually, as they investigated the crime and kept careful notes, they all felt that they were making progress in their investigations. When we discussed the possible suspects however, they discovered that they had not all reached the same conclusion! I was not suprised about this as I had not put in any conclusive evidence. The idea was that I wanted the children to describe the course of their investigation in their reports before they solved the crime, and for them to tell me what evidence they thought they would need in order to put forward a watertight case against the character that they suspected. On this they were unanimous – *fingerprints*! Whilst they brought their investigation diaries up to date I was able to add this as a category in the mystery – and so allow them to solve it. The fact that this software can be edited so easily seems to me to be a powerful feature, enabling the teacher to mould the program to fit the expectations and ideas produced by the children, during the course of the project.

Another way in which *Detect* was used was to build a database of the children's experiences and their opinions of the school trip to Wales. Passages of text were entered by the children under appropriate headings such as Beaches, Castles, Birds, and Opinions. The information was arranged so that to find something out the user simply had to type 'tell about trip'. This produced a list of the headings under which the information was stored, and the user could then ask the computer to 'tell about' one of these headings and was rewarded with another menu or some text on the topic. This was an easy way to build up a file of information which contained mainly pieces of text, and which was simple to query.

This method was also used in the next topic, the Crusades. Information was stored so that children could use the computer as an information source during their project work. In response to a 'tell about' question, the computer would sometimes provide information, but could equally well direct the children to other classroom resources where the information was held, such as a specific section of a book, a map, or a wall chart. The Crusades was the last topic which we covered before the end of the Summer term, and with the onset of the Autumn term Zig Zag moved us onto the Vikings – but that's another story!

Getting back to the original point, this software has been used effectively to support and enhance the curriculum of the class with which it has been used, and has stimulated much written work (both factual and imaginative), artwork, and drama. The major features of these authoring programs are:

a) *A common environment*
Both *Linx* and *Detect* have the same commands and method of entering information, so time spent becoming familiar with one of the shells enables the user to build files for both.

b) *Flexibility*
Each shell can be used for a variety of purposes, e.g. *Detect* was used for database work, and a murder mystery, *Linx* was used for simulations and an 'expert system'.

c) *Extensibility*
Adding information to a database or simulation using the shells is so easy that the materials can be modified within the lesson!

Although words such as 'authoring shells' and 'MicroProlog' may sound intimidating, the essence of this work is that it allows teachers (and children) to express their own ideas, in English, which the computer then puts into a simulation, or other type of software. They allow the teacher to become the 'programmer' and to produce computer-based materials which are 100% appropriate to the scheme of work being followed. The software can be used to promote a range of work across the curriculum, bringing stimulation and excitement for the children.

Notes

1. If you would like to know more about these Prolog programs please contact Les Watson (he has been working on a Nimbus).
2. If you would like to try to create a branching story then you could use *Tracks* from the MEP Primary Project Language Pack, or *Adventure Story* (480Z) on MAPE Tape IV.
3. You can run an investigation, similar to the ones described here, on a 'normal' information retrieval program, e.g. *Grass* (see the article by Paul Kennerley in *MICRO-SCOPE 24*).

A Marble and a Computer

John Lodge
St Augustine of Canterbury RC School, Bristol

Much valuable work in the measurement of time takes place in the primary school and it is a familiar sight to see children armed with pencil, paper and stop-watches timing each other as they run up and down the playground or engage in a whole host of similar exercises. A wide range of activities, and some ingenious timing instruments, have been devised for the primary school in recent years. In spite of this however, there are certain phenomena which are familiar to young children, and which could be suitable subjects for their investigation; yet, because these are so transient in nature, the pupils are unable to time them accurately.

James and Ryan, two boys in my class of 11-year-olds, had been doing a series of timing experiments suggested by their maths text book. They were coping very easily with the work and it became obvious to me that they were not being stretched by it. I have a background in control technology and I wondered if the computer could possibly extend them. So with more faith than reason, I set them a problem.

How long does it take a marble to roll down a one metre slope? How fast does it travel?

A marble was found, the slope was set up and a stop-watch strapped to a wrist. One child rolled and the other timed. Although the time taken for the marble to roll down the chute should have been about the same each time, the results the boys were getting differed widely. A short chat with them elicited the understanding that this sort of event was just too quick to measure by hand; even if they did have a watch that measured in hundredths of a second! Starting and stopping with the necessary precision was just not within their capabilities.

It was at this point that I introduced the control box to them. This particular item plugs underneath the BBC and enables the computer to be linked into electrical circuits in the 'outside' world. This may sound rather grand if you've not met it before, but all it means is that the micro can output signals (to turn on lamps, buzzers, motors etc.) and also receive inputs from simple switches (or sensors, if you want the posh word). To make the computer do these things, you need some software called *Control Logo*; a disc extension to your usual Logo.

Both boys in this project had worked on Logo before. They were familiar with turtle graphics and they had also encountered the MAKE command, when we were doing Logo databases in class. On the science side, they had done some work on electricity and were able to construct simple circuits.

I introduced them to the control box and showed them how to input signals to the micro. This consisted in letting the two wires coming out from the box touch one another and complete the circuit. A screen display of the state of the inputs (there's eight of them in all) helps here. Each time an input is 'on', a small white square appears on the screen.

To detect whether a sensor is on or not, the IN? command is used. Thus the program:

```
TO TEST
IF IN? 1 [ PRINT [I'm on!] STOP ]
TEST
END
```

would go round and round (note that it is in recursion) waiting until the sensor (or switch) on input 1 became active. Once this happened, it would then print 'I'm on' and the program would stop.

There is a clock which counts in hundredths of a second in the BBC and it operates like a stop-clock. The minute you turn your BBC on, it starts up and continues until you tell it to do otherwise or indeed until you turn the machine off.

To set the clock back to zero, *Control Logo* provides you with the command:

```
ZEROTIME
```

and to see how much time has elapsed, you type:

```
PRINT TIME
```

Note that you'll get your answer in hundredths of a second! If you want it in seconds then you'll need to divide by 100.

```
PRINT TIME/100
```

For those of you who are not *au fait* with the MAKE command, I summarise. The command

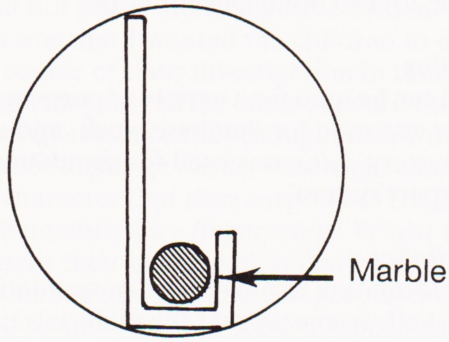
```
MAKE "JOHN 39
```

will attach the value 39 to the variable JOHN, and store it in the computer's memory. If at some later time you would like to see what the value of JOHN is, you type

```
PRINT :JOHN .
```

You will see that quotes are used in setting up the variable, but a colon prefixes the variable when its value is required subsequently.

With this information, the children had enough to solve the problem. They got very involved and it held their concentration for a considerable period of time. They swapped the marble for a ballbearing and they used two simple foil switches to trigger the clock.

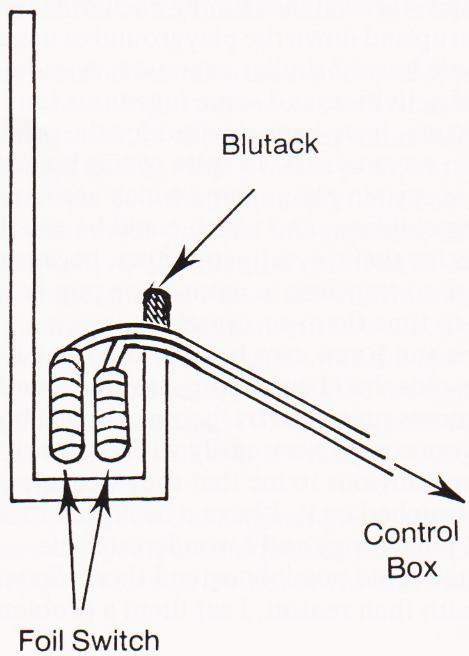


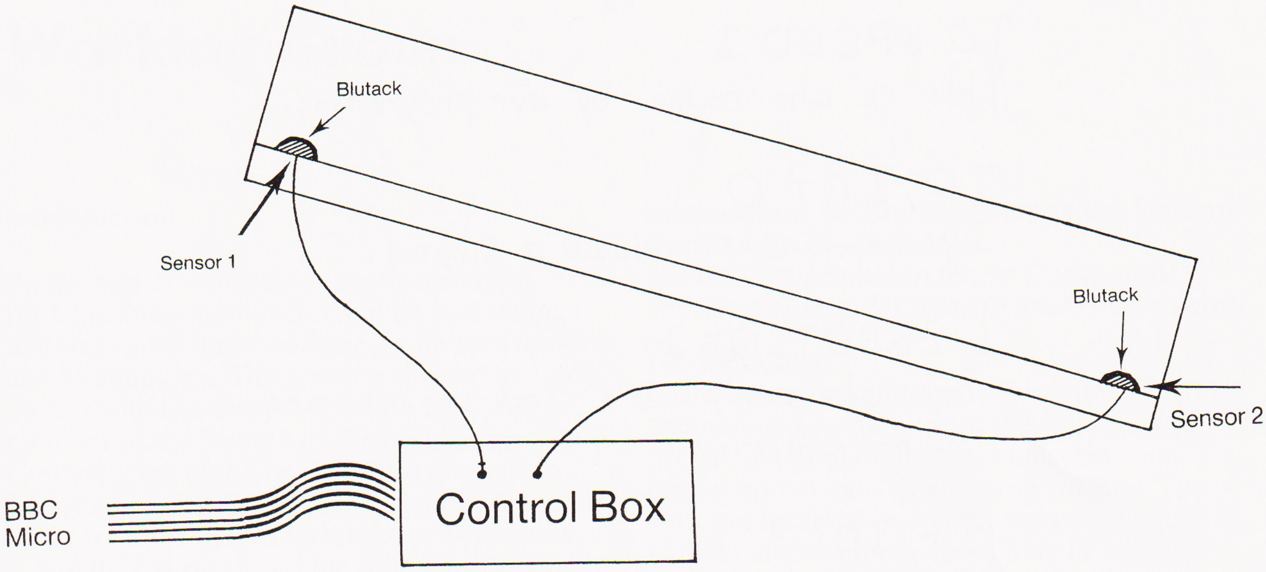
When the ballbearing passed through the switches it made the circuit. The first switch reset the clock to zero and started it on its way; the second recorded the time at that instant by saving it in a variable with a MAKE statement.

The children were able to write a program to time the ballbearing. This ran:

```
TO BALL
IF IN? 0 [ZEROTIME]
IF IN? 3 [PRINT TIME]
BALL
END
```

The second part of the problem entailed finding out the speed of the ballbearing. The boys were unsure how to tackle this, and it required some paper and pencil examples about average speeds of trains, buses and suchlike to





make clear the relationship between time, distance and speed. Once understood, they were then able to write a program to complete the second part of the problem. (You'll see that the command ROUND has been used in the program below. This, as its name suggests, rounds a number up to the nearest whole number and does away with decimal places.)

```
TO SPEED1
IF IN? 0 [ZEROTIME]
IF IN? 1 [MAKE "T TIME/100 PRINT
   (SE [THE SPEED IS]
   ROUND 88/:T [cm per sec])]
SPEED1
END
```

When finished, they demonstrated their work to the rest of the class. All were impressed; especially when the slope was made steeper, and the program responded by returning a higher speed for the ballbearing.

The two boys were quite conscious of the fact that the figure for the speed, which their program came up with, was not a fair statement of events; only a rough average. They planned to go on to fix a series of six or eight sensors equidistant down the slope, so that a more accurate picture of the ballbearing's speed could be obtained at different positions.* But it did spark off some interesting discussion on how best to measure speed. Neither were the children short on ideas for extending the project. Bicycles, it was suggested, could be brought into school and work on speed could be done with these. One boy even suggested laying sensors across the road outside and calculating the speed of the cars that went by! I formed the distinct impression that, with the micro's help, speed could be a fruitful topic for juniors.

I'm bound to say that not all of this project was trouble free. I found, for example, that in the early stages, it was one child who did all the construction and the other did all the programming. I had to intervene and insist that work was shared out, since one of the boys couldn't understand the program that the other had written! Fortunately, this was resolved and a more equal partnership ensued. It must also be admitted that since this was new territory for the children, a fair amount of teacher time was needed to get it off the ground.

However, on balance I think this investment was probably justified. The two boys worked with concentration and perseverance. This project significantly extended their measuring skills and gave them a practical context for handling the concept of speed. And for me, it showed me that I mustn't be too fixed in my thinking. I'd assumed that control technology was strictly for sciences and CDT. But evidently not so. Clearly it holds promise for mathematics too!

**Unfortunately, time ran out and they were unable to complete this.*

The Programme

TO SPEED 1
This is the name of our programme.

IF IN? 0
If input 0 receives a singnal.

[ZEROTIME]
Set the computer's clock to zero and start counting.

IF IN? 3
If input 3 receives a singnal.

[Make "T Time / 100
The computer takes the time and stores it in it's memory under T

Print (Se [The speed is]
Se means sentance, the computer takes the next few things and put them into a Sentance.

Round 88 / :T
Round means to Round the number to the nearest whole number.
88 is the distance that the ball bearing rolled, :T is the contents of T which is the time
/ means divide.

[cm per sec]]
This is the Last bit of the sentence.

SPEED 1
This will send the computer back to the beginning of the programme.

Evidence to the Design and Technology Working Group

Introduction

At the end of April 1988, the Secretary of State for Education announced that he had set up a national curriculum working group for Design and Technology. The group is chaired by Lady Parkes who is a Governor of the BBC and a member of the Secondary Examinations Council. Part of the brief for this group is to advise on attainment targets and programmes of study for information technology, 5–16 years.

MAPE has produced the following document mainly in response to paragraph 9 of the Group's Terms of Reference as detailed in the DES Press Release (136/88). This states:

> 'The use of computer and information technology and other advance technologies in control, simulation and data storage and retrieval is becoming increasingly important in our society. This fact should be reflected in the use of computer and information technology across the school curriculum. Each subject group as it is set up is being asked to consider the scope for using computer and information technology in its subject and to frame appropriate attainment targets. However the design and technology group is asked to provide within the national curriculum a focus for the development of computer and IT awareness, and skills such as keyboard skills and basic programming, by recommending appropriate attainment targets at the four key stages together with a supporting programme of study related to IT and basic computer skills and to awareness of the uses of advanced technology.'

At the end of August MAPE set up a small working party to provide evidence to the Design and Technology Group. The paper that resulted is reproduced here for the information of members. Its purpose is to inform the Design and Technology Working Group about the ways in which microprocessor-based technology can be used across the primary school curriculum. We would welcome written responses from MAPE members on the content of this initial document.

Roger Keeling, Chairman

Information Technology across the Primary Curriculum (5–11 years)

(MAPE's submission to the Curriculum Working Group for Design and Technology)

1.1 Definition

Information Technology can be defined as: 'The technology associated with the storage, retrieval, manipulation, communication and production of data by electronic means. The data can be vocal, pictorial, textual or numeric; and the interaction facilitated by IT can be between people and machine or between machines only. The study of IT includes the economic, social, moral and political implications of its use, and of its application to education, commerce, industry and other areas of everyday life.' (*Information Technology Education 3–16*, Humberside County Council Education Department)

1.2 Rationale

1.2.1 We believe that Information Technology should not appear as a separate subject on the primary school curriculum. Nevertheless we are offering the following suggestions to the Design and Technology Working Group as its brief is to provide a focus for the development of computer and IT awareness and skills. We understand that each subject group is charged by the Secretary of State to consider the appropriate applications of microprocessor-based systems.

1.2.2 In order to facilitate the formulation of attainment targets and associated lists of suggested activities we have specified four main areas of activity.

These are (in no specific order):

a) Text processing,
b) Information processing,
c) Using, adapting and creating models,
d) Aesthetic awareness.

The suggested activities can be implemented from within different curricular areas.

1.3 General principles

We would like to set the attainment targets, and the associated lists of experience, for these four areas within the context of five general principles which provide an overall philosophy relating to Information Technology:

1.3.1 Microprocessor-based systems should be used only to support, enhance or extend an activity which improves the quality of learning for children.

1.3.2 Microprocessor-based systems should be regarded by both teachers and pupils as a tool which should be utilised whenever it is appropriate to a learning situation. Teachers and pupils should be involved in an educational process which will enable them to make an informed choice.

1.3.3 Microprocessor-based systems should be used to supplement, and not to displace, first-hand experiences.

1.3.4 Progression involves exposure to more challenging and demanding educational experiences which lead to the acquisition of more complex skills and concepts. These experiences do not necessarily involve the use of more sophisticated computer software.

1.3.5 We believe that all the suggested experiences detailed in this paper should be offered through curriculum based activities. The lists of suggested activities will, in addition, foster the acquisition of some general IT skills and attitudes, including:

Confidence and competence in the use of technology;
An awareness of the applications of information technology in the world outside the classroom;
An appreciation of the potential and of the limitations of microprocessors.

1.4 Minimum entitlement
We believe that the experiences suggested in this paper provide a minimum entitlement for all children.

Should the Working Party wish to hear our views on other possible areas, for example interactive video or CD-ROM, or seek clarification on any of the points in this paper, we will be pleased to respond to specific requests.

2. Text Processing

2.1 Definition
Text processing involves the use of microprocessor-based systems to create, store and manipulate text.

2.2 Rationale
2.2.1 Text processing releases children from the physical constraints of writing, allowing them to concentrate on the content.

2.2.2 The ease with which text can be manipulated provides the child with a powerful and creative tool for thinking: it encourages children to develop a critical self-awareness of the processes involved in arriving at the final product.

2.2.3 The success experienced by children using text processing enhances their self-image and improves their motivation.

2.2.4 Text processing can lend itself to a collaborative rather than an insular approach to writing, which offers children exciting opportunities to share and develop ideas.

2.2.5 Text processing should be seen as a medium for creativity, and not simply as a means of obtaining a 'best copy'.

2.2.6 Microcomputer-based text handling is something that children throughout the primary age range can engage in.

2.2.7 The addition of alternative keyboards, which allow whole word or phrase input, give even the youngest children access to this most powerful medium.

2.2.8 Experience with text handling should be gained across and within the primary curriculum rather than as an isolated activity.

2.3 Attainment targets
2.3.1 By age 7 children should:

i) be able to use a simple text handling package to produce a piece of work of their own individual creation.
ii) be able to work with their peers to produce a piece of collaborative text.
iii) be able to carry out simple editing, involving insertion and deletion, to change a piece of text.
iv) be able to utilise intelligently a range of print sizes.

2.3.2 By age 11 children should:

i) be able to demonstrate competence with a variety of text handling packages which give access to a range of type sizes, a range of fonts, a variety of different page layouts and the integration of simple computer graphics with text.
ii) be able to manipulate text by altering page layouts and print styles.
iii) be able to select an appropriate style and layout for a given audience.
iv) be able to demonstrate a critical approach to their own writing, and be able to produce drafted, edited pieces of text which successively illustrate a development of style and content.

v) be able to demonstrate some appreciation of the appropriate uses of microcomputer-based text processing.

2.4 The following is a list of experiences relating to the development of text processing skills

2.4.1 Creating text
Simple sentences;
sequencing short pieces of text;
collaborative writing;
writing for a variety of purposes and audiences (stories, reports, poems, scripts, instructions, tables, letters);
spell checkers;
incorporating simple graphics;
planning and expanding.

2.4.2 Editing text
Immediate correction of mistakes;
using cursor keys to correct mistakes;
redrafting;
search and replace;
moving and copying sentences/paragraphs.

2.4.3 Manipulating and presenting text
Changing layout;
changing print styles to achieve special effects.

3. Information Processing

3.1 Definition

Information processing is the storage and retrieval of information or data through a variety of means. This necessitates the collection, organisation, analysis and application of such data. In computer terms this specifically relates to the use of databases, spreadsheets, teletext, viewdata, interactive video (Domesday) and CD-ROM. Information processing includes the collection of:

a) 'real' data from the environment;
b) textual/pictorial/graphical data from primary sources (eg books);
c) electronic data from a variety of sources (Prestel, TTNS Viewdata etc).

3.2 Rationale

3.2.1 In schools, the processing of information is not new and its application can be used right across the primary curriculum. The accessing, organisation and presentation of information has always been an essential part of the education process.

3.2.2 Technology has greatly enhanced the extent and scope of this activity. Traditional skills, such as reading and sorting are still needed, but new techniques must be added to these if pupils are to become more efficient users and providers of information, both in written and electronic form.

3.2.3 Children need to know about the ways in which information can be structured and accessed, and teachers should introduce these skills in the context of material which is relevant, meaningful and interesting to their pupils.

3.2.4 In particular the advent of interactive video and CD-ROM technology makes it all the more important that children understand the nature and the variety of sources of information, and acquire the skills to access and utilize it.

3.2.5 Teachers should recognise that information processing does not only equate to databases. Some of the attainment targets below can be met through introducing children to the advantages of a spreadsheet. Similarly the collection of data may be for the purpose of display in a local viewdata package.

3.2.6 All children should have experience of using and creating databases, but in addition, the value of other electronic means of providing and displaying information should also be recognised.

3.2.7 The manipulation and interrogation of data is becoming such a fundamental and important skill that we think it should form the basis of the attainment targets pertaining to this area.

3.3 Attainment targets

3.3.1 by age 7 children, individually or collaboratively, should:

i) be able to collect and record information in order to develop and test hypotheses relating to the information.
ii) be able to create and amend an appropriate database.
iii) be able to manipulate the data for a specific purpose (eg make a simple search or sort on one field).
iv) be able to interpret the processed data and communicate the results to others, in a variety of formats.

3.3.2 by age 11 children should, using suitable terminology:

i) be able to formulate hypotheses and develop strategies in order to test them.
ii) be able to employ a variety of methods in the planning, collection and recording of data.
iii) be able to purposefully manipulate the data at several levels, eg by performing more complex searches and sorts.
iv) be able to interpret and present results in a variety of formats.

v) be able to justify the type of database selected (eg relational or hierarchical database).
vi) be able to show an awareness of the potential and limitations of information processing.
vii) be able to demonstrate an awareness of the wider, real-life applications of information processing.

3.4 List of experiences relating to the development of information processing skills

3.4.1 Creating a database
Collecting information;
sorting into sets;
categorising, eg setting up fields;
making a database shell;
entering data.

3.4.2 Manipulating data
Interrogating data;
searching;
sorting;
displaying results graphically.

3.4.3 Modifying data
Editing records;
adding and deleting records;
merging files.

3.4.4 Disseminating the findings
Interpreting the data, advancing and testing hypotheses;
critical analysis of results;
printout in text or graphical form;
communicating results.

All these experiences will provide further opportunities for children to develop the general skills of:

i) devising and testing hypotheses;
ii) working collaboratively;
iii) recognising and solving problems.

4. Using, Adapting and Creating Models

4.1 Definition

Modelling involves the use of microprocessor-based systems to manipulate, modify and create concrete or abstract simulations which may be either factual or fictional in origin. Children can then investigate and control these models to obtain a better understanding of their own environment, a fictional environment or the wider world outside their own experience.

Modelling is a medium to enable children to investigate their environment. It may be a simplified simulation of an experience where the users take on one or more roles and have considerable control over the outcome. It is a means of presenting problems in a variety of contexts and thus encourages the development and use of the skills of problem solving and communication.

Some simulations may involve the construction of a physical model which provides a solution to a problem. This model may involve the computer as its means of control. An example of this may be the use of a computer to sense changes in the environment and to respond according to predefined instructions.

4.2 Rationale

4.2.1 A computer model can be used to demonstrate actions and results that would otherwise be difficult to present in any other form. This experience is intended to supplement more concrete experience.

4.2.2 Mathematical models may be created to enable understanding of relationships and to explore solutions to problems through the formulation, testing and adapting of hypotheses (eg spreadsheets).

4.2.3 Computer-based models place groups of children in environments where they are able to make decisions, learn from their experience and modify their decisions in the light of that experience.

4.2.4 In controlling physical models (eg a lift), two specific skills are required; firstly the skill of sequencing instructions and secondly the facility to manipulate variables logically. This may involve the use of a programming language (eg Logo).

4.2.5 Modelling is a medium that crosses all curricular boundaries. It develops and requires a wide range of skills traditionally associated with such areas of the curriculum as humanities, mathematics, science and language.

4.2.6 Modelling has three identifiable stages each of which involves both concrete and abstract experiences. This is illustrated in the table opposite. Normally learning activity moves from concrete to abstract but the analysis shows that the movement between the two is not only interactive but increasingly interdependent.

4.2.7 A consideration of the analysis shows that control of the outcome gradually moves from within the program towards the users as they progress through the stages.

Table 1. Using, Adapting and Creating Models

Control/Sequencing	Simulation (Role Play)
Concrete	**Abstract**
Manipulating existing models	
1. Giving direct instructions to a "human robot". 2. Using simple, self-contained programmable toys in direct command.	1. Giving separate direct instructions to a screen object (eg. a screen turtle). 2. Exploring simple simulations with a restricted set of commands. 3. Exploring simple simulations with a wider choice of successful strategies and solutions.
Modifying existing models	
1. Giving a list, or program, of instructions to a "human robot". 2. Programming simple toys. 3. Using simple kit systems to construct and control models.	1. Exploring simulations which allow control of variable parameters. 2. Using mathematical models to explore the variety and range of solutions to a problem (eg. spreadsheets). 3. Giving a sequence of instructions (ie. a program) to a screen object (eg. a screen turtle in Logo).
Creating new models	
1. Creating and controlling a model which provides a solution to a particular problem. Selecting the most appropriate materials (eg. designing and making a working model of a lift or level crossing).	1. Designing and creating mathematical models to explore solutions to a problem (eg. spreadsheets). 2. Creating simulations using a simulation authoring program or a suitable programming language.

4.3 Attainment targets

4.3.1 By age 7 children should, individually or collaboratively, be able to:

i) give direct instruction to a 'human robot' or a self-contained programmable toy.
ii) give separate and direct instructions to a screen object, eg a screen turtle.
iii) explore a simple simulation using a variety of strategies.
iv) extract and record information provided by a simulation and modify their strategy in the light of that information.
v) communicate hypotheses to others and adapt their own hypotheses in the light of further ideas or information received.

4.3.2 By age 11 children should, individually or collaboratively, be able to:

i) give a list of commands to a screen object in procedural form, and predict the outcome of such commands.
ii) design and build a physical model; to control the model by direct commands and to explore and evaluate a variety of solutions.
iii) vary the parameters within a simulation, either in order to test a hypothesis about the relationships within that simulation or to vary the problem under investigation.
iv) use and adapt a mathematical model in order to explore the relationships within it and the range of possible solutions to a problem.

5. Aesthetic Awareness

5.1 Definition

The development of aesthetic awareness involves the use of a microprocessor-based system to create, capture, modify, reproduce or store images (graphical or sound) in electronic form.

5.2 Rationale

5.2.1 Our society relies heavily on the use of images as a means of communication; many of these are produced and presented in an electronic form. This process is now a major dimension of the society in which we live and of the pupils' everyday life. Thus schools should provide pupils with the opportunity to explore the potential of such images both as a means of communication and as an expressive art form.

5.2.2 As they gain competence in image processing children of all abilities will be better able to understand both its limitations and its powerful potential. This medium has much to offer; for example, in music sound icons can be explored and easily linked to form a tune; in art and design there can be control over scale, lighting sources and palette range, and a history of the development of an image can be stored for evaluative purposes. Because of this ease of access to such processes, a greater range of pupils will be able to exercise and develop higher level skills.

5.2.3 Aesthetic awareness will be developed, not through information technology or even image processing 'lessons', but through the core and foundation subjects within the national curriculum.

5.2.4 Set out below are suggested attainment targets, followed by a possible list of experiences in four distinct areas – these are set out in order of progression within each area.

5.3 Attainment targets

5.3.1 By age 7 children should:

i) be able to create or assemble images which reflect individual composition. This may be a pictorial image or a simple tune made from elementary building blocks.
ii) be able to manipulate images at a basic level in art and design, demonstrating an exploration of lines, points, simple pre-drawn shapes and a variety of paint-type tools (translations, rotations, changes of size and colour).
iii) be able to sequence a number of images (graphically or musically) to communicate an idea or story.

5.3.2 By age 11 children should:

i) be able to extend their compositions through the use of libraries of predrawn images or pre-defined sounds, combined with a variety of images from external sources.
ii) be able to extend their manipulation of images and provide reasons for the choices made.
iii) be able to extend their ability to sequence images illustrating a variation of time, position, repetition and a number of images used, for example, create a short sequence based on their own images to produce an animation.
iv) be able to extend their ability to assemble and integrate images (graphical and musical) and text in the form of a coherent, audience specific, composition.
v) be developing an awareness of the limitations and potential of microprocessor-based systems with relation to art, design and music, and be able to justify choices made.

5.4 List of experiences for development of aesthetic awareness

Creating	Manipulating	Sequencing	Assembling and Integrating
Graphics			
Exploring using lines, points and simple predrawn shapes. Own composition using a variety of paint package tools. Own composition using a library of predrawn images.	Change colours. Translate images. Rotate images. Change size. Overlay images. Select from range of palettes. Repetition of images. Changes of perspective and lighting. Generation of solid images. Image enhancement.	Assemble series of predrawn images to communicate ideas and stories. Variation of time, position, repetition, and number of images used. Create short sequence of own images.	Exploring the ways in which words and pictures can be used to convey ideas. Manual 'page layout' using both computer generated and manually generated images and text.
Music			
Exploring sounds	Exploring pitch, duration, rhythm and key. Investigate ways in which sounds can appear graphically on the screen.	Assembling a range of pre-set sounds to create a composition for a given purpose.	Exploring the ways in which sounds can create or contribute to an 'atmosphere'. Integrating electronic sounds with sounds created by conventional methods to create a composition with purpose.

6. Additional Comments

6.1 Introduction

6.1.1 We hope that the suggestions in this paper offer a general framework which will be achieved through curriculum related activities. In addition we would like to respond specifically to the reference to keyboard skills and basic programming in paragraph 9 of the Secretary of State's Terms of Reference.

6.2 Keyboard skills

6.2.1 In the primary school, keyboard skills should be acquired through a range of practical experiences and should not be taught in isolation. However, in order to clarify the debate, we need to give definition to the phrase 'keyboard skills'. This does not mean the ability to type using all ten fingers, but the ability to type fluently (a combination of speed and accuracy) as appropriate to the task in hand. For example, four-finger typing would be perfectly adequate when composing at the keyboard using a word-processor if the typing process did not interfere with the composing process.

6.2.2 Although the formal testing of keyboard skills is not recommended, teachers should ensure that children are developing competence in this area. It is a skill that will be useful throughout their lives, but very few children will need to develop the skill to 'touch typing' standard.

6.3 Programming

6.3.1 The advocation of the teaching of programming at primary level depends upon the definition of the term 'programming'. Our definition of programming activities would include the following examples:

inputting a series of instructions as part of an exploration/investigation, or as a means of controlling a remote sensing operation;
linking a number of time-dependent images together to produce a simple animated sequence;
the acquisition of a sound working knowledge of Logo in order to facilitate the illustration of certain mathematical ideas or to solve problems which arise from other curricular activities;
inputting a series of instructions to facilitate the use of a programmable toy or calculator.

While we commend this type of programming we believe that there is no justification for teaching any type of programming language, whether it be BASIC or Logo, as an isolated activity. Programming at primary level should be taught only as an integral part of a curriculum-led activity. For example, an elementary programming knowledge (in terms of providing a sequence of instructions to a micro) will be necessary in order to monitor environmental changes or to model the workings of a level crossing. Logo can be a medium for delivering certain of the experiences already mentioned (eg development of problem-solving skills, the use of Music Logo to experiment with primitive sounds). However, the testing of programming ability, out of context, is inappropriate and not to be recommended.

Conclusions

6.4.1 We believe that the list of experiences given in this paper provide a minimum entitlement for the main body of children in primary education. We have not detailed the additional experiences which could be offered to the more able child, neither have we suggested an activity list for the less able child. We would be prepared to offer advice relating to these if the Working Group requested this.

6.4.2 Training provision: there are major in-service and pre-service training implications in order to enable teachers to implement these attainment targets effectively. Teachers need to be supported by in-service training. The use of microprocessor-based equipment should form an integral part of the primary curriculum as presented to students undergoing pre-service training.

Resource provision: every child should be able to have access to such equipment whenever its use is appropriate. Only then will the attainment targets be accessible.

6.4.3 Finally we reiterate the need for the programmes of study to be provided by the appropriate subject working parties. These programmes should be the vehicles by which information technology is delivered.

Working Party Composition: The following people contributed to the working party that produced this paper:

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The Swedish Local TTNS Database

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1. Background

In 1984, I visited the UK for the first time looking for useful contacts with a view to an international exchange of educational ideas. Although at this time I was mostly concerned with problems relating to the new model for initial teacher training we were setting up in our own department, I was also very interested in other applications of the new technology. I met people connected with MEP, went to a course at the MEP Centre in Newcastle and together with my colleague, Bertil Olausson, spent a week visiting different institutions trying to understand what was happening in the UK at that time. It was lovely! We met so many wonderful people; everyone was helpful and very generously gave of their knowledge and experience. We found it very exciting to compare problems and ideas from the two countries. (In Sweden there was not then, and still is not, any official programme for educational computing at primary level. We do have lots of IT in Swedish society and also use computers and give computer courses in schools, but not until the secondary level. The governing bodies have so far been very cautious about the use of computers with very young children, but this pattern seems to be changing. The government has now put aside money to start trials of IT in primary schools.)

However, back to our story. When we came home again, we applied for money for our project from the Swedish Education Department, from Swedish Telecom and also from our own college. Three years later the range of IT-related activities which are happening in our primary schools is too wide to give you more than just a flavour.

Our primary project schools use BBC micros, with programs such as *Front Page Extra, View*, some of the MEP Primary Project Maths programs, *Tray, Folio* and a few other UK products which we consider good software. We try to adapt this to our own ways of organising learning in schools, and like to think of what we do as collecting experiences for the development of ideas which can be implemented later when our environment is even more IT orientated.

2. The Swedish TTNS base

2.1 Motives for IT in school

With valuable help from our many British friends we have managed to set up a small Swedish TTNS system. We use the network, among other things, to link classes from Sweden and the UK and as this aspect of our work is particularly relevant to *MICRO-SCOPE* readers, I will concentrate on that.

Firstly, let me give you some thoughts on why we think it is important to use data communication in schools.

1. Most pupils in our schools now will still be living and working in our society in the year 2030. At school you prepare for life, and data communication will play an important role in the society of the future.
2. The individual must learn in school how to select, interpret and evaluate information and also understand how it can be used and manipulated.
3. Those of us concerned with education are already finding an increasing need to use open learning systems in order to cope with educational demands in our rapidly changing world.
4. There is probably no better way to help children understand what IT means and what it can be used for, than to let them use it themselves, for their own information handling.
5. The school itself must guide the use of IT for educational purposes, and provide pupils with sufficient basic skills to allow them to create their own visions of the future. It is *they* who will have to create the future.

2.2 A tool for what?

Now, if one accepts that it is important to use IT in school, what should it be used for?

We use TTNS to handle such information as is normally handled in school and which can easily be handled with the help of menus and simple commands. If you log on to our system, you will see that almost all information and all screens are in Swedish – here is an opportunity for you to learn Swedish!

At the system prompt, type the following command:

>CO YNF000>MENU.CO

We also like to think that the data network can be used to tap the many sources of human intelligence and competence. Everyone talks about artificial intelligence, but what about the real thing? If you believe that a group of human beings has more collected knowledge than each member of the same group, should we not be exploring ways of using the data network to solve real problems in a collaborative way?

We all believe that reading and writing are more stimulating if you read and write texts from and to a 'real audience'. This is true of the mother tongue as well as of the second language, (which in our case is English!). We have tried therefore to link every class in our network to a 'sister class' in England. For our children, we believe that they can learn a lot about their own society, natural environment, history and culture if their motivation for learning is to tell children in another country how things work over here. Being asked to answer questions by children in another country helps them to become discriminating users of information. On a personal level, if only a small percentage of the Swedish and British children find personal friends to write to (perhaps even using snail-mail as well!) and perhaps meet later in life, I think we shall have gained something valuable.

2.3 So how is it going?

Our first year of struggle was much concerned with training, technical development and making contacts. My original hope was to arrange a meeting in Kalmar where teachers from the UK and Sweden would meet in a three days' planning session to facilitate collaboration over the network. Visits to the British Council in London and in Stockholm raised our hopes, but whilst we were filling in the formal application forms for the money, a change of personnel in Stockholm went hand in hand with a change of criteria for grants, and so we were not given the necessary money. This was a great pity, since I think it would have been a very stimulating working conference.

The main problem in sustaining such a project is to ensure that contacts have sufficient long-term commitment to develop the deeper educational applications of networking, over and above the superficial, if valuable, penpal activities. We have found that everything is easier at the primary level; not many of our classes at secondary level have managed to get collaboration beyond the penpal stage. There are several reasons for this; the students have exams and a heavier burden of school work at secondary level. This networking is still looked upon, by both teachers and pupils, as something on top of the ordinary school work, rather than as a new avenue for learning.

Of course we have also had many good experiences with the secondary project. It is, for example, very nice to be able to log on to any of the UK local databases and have a look through a window at UK culture. We still think there are lots of other possibilities for educational use. For example, you could collaborate on environmental pollution problems, simulate processes in multi-national economy, let the students have a debate on international events, write problem corners, and put questions to each other about phenomena from the geography, history and social sciences of the other country and in that way reflect on the 'home conditions'; so we will continue to look for partners in the UK interested enough to carry out some pioneer work.

At primary level we have had some very good experiences from the use of TTNS. One example is Ljungbyskolan in Sweden and Sitwell Junior School in Rotherham, where teachers Ake Gustavsson and Alan Young decided to let the children create database sections where they could display what they considered to be important cultural items from their respective home regions. Have a look! You can access this from either the Kalmar or Rotherham database.

I heard recently that one of our schools participated very successfully in the International Newspaper Day on 10 March. The children and the teacher were very pleased with the new wordprocessor *Folio*, which they used on the day.

2.4 Future plans

We have recently outlined eight new projects where TTNS could be used, based on ideas stemming from our first year. We have applied for money for these projects, and hope that at least some of them will be able to 'take off' next year. We still have many problems, technical and otherwise, but we feel the rewards are such that we shall certainly not give up.!

If anyone reading this feels that they are interested in linking with us from the UK, please let us know. You can write to YNF001, and we will take it from there.

Many kind regards to all our friends in the UK.

Further Along the Line of CITE

Mark Gunn
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In an article in MICRO-SCOPE 17, Ros Keep and David Smith of NFER outlined the methods for software evaluation which they were developing with teachers. 'We have worked up the skeleton of a case study approach which we are now just beginning to flesh out in collaboration with teachers in Berkshire.' This article, by a member of one of the Berkshire groups, will give you some idea what the flesh looks like, two and a half years later!

Now that almost every school in the UK has a micro, teachers are becoming increasingly aware of its possible value in the classroom. There is a lot of software currently on the market which purports to be 'educational', but how can teachers assess how good a package is?

The start of the Spring Term 1986 saw another pile of information from the local Teachers' Centre. Amongst the notices was an item appealing for teachers to help with computer software evaluation for IN-CITES under the auspices of the National Foundation for Educational Research (NFER). The IN-CITES approach to educational software evaluation is based on a team of practising classroom teachers using software in real classrooms. The meeting turned out to be one where we, as a group of interested teachers, were asked to get involved in forming an evaluation team. Rather than being talked to, we were expected to do the talking! We were to form the nucleus of a team of class teachers in East Berkshire looking at the role of various types of educational software within the primary classroom. The team co-ordinated a number of processes which could provide the sort of reliable and credible information which teachers need in order to make informed decisions about software.

The IN-CITES approach is flexible, and is suitable whether the group decides to look at software specific to a particular age range, subject, or type of learner, to compare different packages of the same type, or to examine the uses of one particular package in a number of schools. The system was developed using local Teachers' Centres as the focus, but would work equally well with a school as its base. The team comprised seven class teachers covering all the primary age range from four schools across East Berkshire, all using BBC micros.

We decided that our best approach would be to look at a particular area of software, and after some deliberation, settled on databases and their potential contribution to classroom activities. We then tackled the problem of which of the many available packages we should look at. The Berkshire Centre for Computers in Education stocked *Inform, OurFacts* and *Grass*, so the choice in a way had been made for us! We felt that these three packages spanned the primary age range, using *OurFacts* with infants, *Grass* with lower juniors and *Inform* with upper juniors.

Each package was looked at:

for ease of use technically;
for educational worth;
for accuracy of content;
by users (usually children);
within the classroom.

The first four of these points can be covered either from expertise within the group, or by importing it from outside, using checklists and questionnaires. Evaluating the use of the products in the classroom is probably the most important aspect of the procedure. The IN-CITES approach requires the team members to observe one another's classrooms, and also to interview the users – the children as well as the teachers.

After about six weeks' classroom use and observation of each others' classes we met to discuss our views. These discussions resulted in the compilation of a review of each package divided into the above headings. To make our reviews accessible to more teachers we entered them into *Microviewdata* and this was then made more widely available through Micronet. We also wanted to share our experiences with local teachers so, using the classroom materials and children's work generated during the previous term, we ran workshops and introductory sessions for teachers to assess for themselves the potential of using database material across the primary curriculum. These sessions proved very successful and we are still being asked for re-runs by the heads of our Teachers' Centres.

The IN-CITES approach is valuable not only for the information it can produce, but also for the professional development of individuals on the team. In working together and sharing experiences, a supportive network was built up. We were also able to identify areas where future INSET would be appreciated by teachers.

Notes

OurFacts – MEP Primary Project. An updated version has been included in the ESG training materials produced by MESU, for both BBC and Nimbus machines.
Inform – Nottinghamshire County Council.
Grass – Newman College, Birmingham.

For more information regarding these packages, initial contact should be made with your local Educational Computer Centre.

Wordplay Revisited

Anne Foster
Inverkeithing Primary School, Fife

Wordplay, a poetry generator, is one of the 'golden oldies' of educational computer programs. It was available in dim and distant PET days. Now, the 'new improved version' – adapted by Newman College and the Micro-computer Unit at Fife Educational Resource Centre – is a valuable addition to a school's software 'toolkit'.

In the past I have found it quite difficult to introduce children to poetry. We spend lots of time encouraging them to write in sentences, so some children get confused when we ask them to write only in descriptive words and phrases. But *Wordplay* really has made poetry easier for me and, more importantly, for the children. And more fun too!

Wordplay takes lists of nouns, adjectives, verbs and adverbs and scrambles them to a random pattern or to a pattern that the teacher can define and then prints out the 'poems'. The file of words already on the disc is on the theme of 'Winter', but it is very easy to make your own lists which may be integrated with any class topic.

After the title page, the main menu looks like this:

WORDPLAY CHOICE PAGE
A play with my words
B enter your own words
C edit the current list of words
D save your set of words on disc
E load a set of words from disc
F see the notes
G teacher settings
H stop

Choosing option A allows you to play with 'Winter' words and will generate a poem like this:

WINTER

Streams glisten, roads freeze
Icy valleys sparkle,
Silver, hard, cold,
Brilliantly bright, silently white.

However one of the most valuable aspects of this program comes from the discussion needed to develop your own list of words using option B. I have found this works well as a group activity away from the computer.

The idea of word classes has to be discussed and lists of appropriate words and phrases built up under the headings nouns, verbs, adjectives and adverbs.

After seeing their first attempts there are a number of points that the children will need to consider and discuss.

BRIDGES

Rusty red big dipper shape
Crawling, carrying,
Structure rusty red
Against the sky suspended
Cables mighty
Spanning angularly, sturdily standing

Why are some lines grammatically wrong?
Can we make it more descriptive?
What happens if we change the 'shape' of a poem?
Why are some lines nonsensical? (The children are usually amazed that the computer can be 'wrong' – a valuable point to make about technology.)

The outcome is a very worthwhile activity developing language skills in a context that will instantly let them see the effect of changes they make. It is very easy to edit and save your lists through options C and D.

With the original version of *Wordplay*, at this point the group would churn out pages and pages of poems which were then used as an ideas bank for the childrens' own poems. The walls were frequently papered with strips of printer paper with the lines and phrases we thought were good marked in highlighter pen.

I felt that extending this work past the computer stage was important as I wanted to encourage the children to use their own ideas and imagination alongside the computer generated phrases and write their own poems, otherwise the creative experience would be rather limited.

Now, by using the new improved *Wordplay* it is much easier for each child to develop his own poem at the computer, then print it in different forms.

The following improvements have been incorporated:

1. You can move from line to line with the space bar and individual lines can be changed using the delete key.
2. Poems can be saved and recalled for further work with *Wordplay*. They can also be saved for use with *Writer* and *Prompt/Writer*. This allows children to edit an existing poem, to wordprocess it and to print it out using different sizes of print.
3. Teachers can set the pattern and length of the poems or randomise them.
4. Word lists can be printed out.
5. Poems can be printed out in small and large text.

Obviously much more computer time is needed if you want a group of children to work on their poems using all these facilities.

With such a range of options, *Wordplay* is a very adaptable, content-free software 'tool', and an ideal way of using the computer as the stimulus for a creative activity.

In using it, I feel the children gained a lot. They were more successful in the poems that they wrote; they enjoyed creating them and became much more motivated to write their own. The children became keen to improve and edit their work and persevered to achieve a high standard of presentation. Language skills were developed in a dynamic way as ideas encompassing word classes, semantics, sytactics, synonyms, similies and figurative language were discussed and implemented. Ideas were exchanged and modified in a collaborative task. As they worked the children gained experience of a 'real' computer use, becoming confident in its use and able to handle the discs. Since *Wordplay* is content free, it can be used at many primary stages and with children of different abilities.

From my point of view it is an extremely useful teaching aid that allows me to use the computer with children in an educationally effective and creative way that integrates with class work. *Wordplay* has been one of my favourite programs for a long time and the new version is great. I hope you like it too!

NB Scottish readers may obtain the latest copy of *Wordplay* from their regional Computer Advisor. Anyone else should contact their MAPE regional representative.

Noah's Ark

The ark was rocking.
The family was angry.
Animals were puzzled,
Pushing and kicking.
It was raining so hard.
Hurrying anxiously in a line.
Thunder and lightning,
Noisy, confused ship,
Waves crashing, lashing.
Pushing and shoving,
Noah hurrying,
So worried.

Safe mountain top,
Beautiful rainbow promises in the sky.

Lynne Stewart (8)

The Beginning

The great creation has started.
That tiny wee cell,
As it grows in that water bag
That begins to swell.
Her stomach gets bigger.
As it grows each day
In that gloomy and murky place
In which it has to stay.

Donna Lambert

Dinosaur

Dinosaur in a
slimy swamp,
Gigantic,
Hungry,
Teeth like chisels,
Charges at a baby dinosaur,
Frightened,
Mother dinosaur to the rescue,
Dinosaur battle,
Safe!

by

GRANT KING

Software to Look At

Don Walton

The purpose of this column is constructive. The aim is to print 'thumbnail' reviews on software over which I find myself enthusing. We all know of software which we personally think has little to offer but when it is used by someone else it stimulates the most marvellous work. It is difficult for any reviewer to take this into account and it is therefore a purely personal column and software which does not appeal to me will not appear unless in my rounds it is shown otherwise. As they are only 'thumbnail' reviews they will lack much detail, but I hope that they will give you enough information to recognise any potential and at the very least indicate that perhaps the software is worth looking at.

ScreenPrint

ESM, Duke Street, Wisbech, Cambridgeshire. £25.00; discounts for quantities.

There aren't many bits of software around that you use by pressing two keys at once and then it does something really useful without any further instructions. *ScreenPrint* is such a program. It is, strictly speaking, I think, called firmware because it is a ROM and this adds to its simplicity. After installing the ROM in your BBC B or Master you can at any time in almost any program obtain a black and white printout of the screen by pressing CTRL and the letter P. It freezes the screen, prints it out and starts again. Great for the children to include in their *Dragon World* folder or take home, and great for teachers to use when preparing imaginative backup resources. Also great for the printer ribbon suppliers, I should imagine.

Compose

Shell Centre, Nottingham University

I immediately feel cramped by a brief to produce 'thumbnail reviews'. I can only describe *Compose* as being special, special in its concept and special in the way it has been executed in the software. It is, as the title might suggest, a program for composing music, but there is not a stave to be seen nor any black dots, or any lines. The child is offered what might best be described as musical building blocks. Each block contains a musical phrase which you can listen to before choosing, and the block is decorated with a picture which can simply suggest a name to call the block when the children are discussing whether to use it and where it might go. The children simply fit the blocks inside a box in the order they wish them to play, press L and sit down and listen. The box of blocks can be rearranged at will; it can be printed out and it can be saved as a tune. There are lots of sets of blocks including Chinese and Egyptian musical phrases, but an imaginative teacher or older child can construct their own pictures and phrases and to spoil you for choice there is an extension disc with more. Every class should have a *Compose* and it is nice to see that it is freely copiable within the purchasing institution. I hope that privilege will not be abused.

World Development Database

Longmans; £18.00.

World Development Database is simply a set of data collected and published by the World Bank/Longmans which has been typed into *Grass* and *Quest* files. It is very powerful data in that it can illustrate to any child over ten years of age the relationships between the rich countries and the developing countries in the world as well as sketching out the network of contributary causes to these problems. It has data on literacy rates, infant mortality, life expectancy, calorie intake etc, for 125 countries and it can easily be sorted, compared and contrasted using *Grass*. Each of these headings, and there are thirteen of them, can be used as part of a project that can last for a whole term and there is a description of such a project in the package along with the original World Data book.

The disc has several files which go with *Grass* and *Quest* as well as files which can be used by *QMap*, a program which allows you to map any set of data in *Quest* onto (after a lot of juggling with discs) a map of the world. On the *Grass* files each country has been given a map number. After searching for countries with a particular set of criteria the child can shade in on the map the areas which correspond to the map numbers and see the geographical relationship of the criteria.

For upper primary and secondary school children this data provides a really worthwhile basis for a topic. I have found it very useful for INSET as the intrinsic interest of the data soon encourages teachers to be asking many questions of the information and stretching their data handling software to get the answers. You do need to have a copy of *Grass* or *Quest* and *QMap* before you can use this package as it is only data. It doesn't seem to make this very clear in the package which confuses even further by including a document that looks like Longmans standard 'how to use the program sheet' which does not apply to this disc.

This sort of data should be made copyright free in the interest of world education and understanding. I have no vested interest in this package other than that I want the data to be used in as many schools as possible, as cheaply as possible. The price of £18.00 seems far too much. Had the data been copyright free then any school could have bought The Development Data book and used the information for a couple of pounds; instead of that it has taken three years for it to appear at an inflated price. An added disincentive to its use is the copyright small print which states that an institution may use only one copy at a time. Surely it should be made copyright free within the institution. There is no mention of licensing either. The inclusion of The Development Data Book Teaching Guide, mentioned on page 10 of the Users Guide, might have gone some way to make this package value for money; unfortunately, contrary to expectations, it is not part of the pack.

A worthwhile project for MESU would be to ensure a supply of big chunks of data for use on the new 16/32 bit machines. There are many fascinating databases which could be used in schools by children and teachers alike on machines which are as slick as those on Star Ship Enterprise.

P.S. *My thumbnails are quite big!*

MAPE News

Great Western

The Spring Term Problem Solving Evening
It is lovely challenging a group of teachers to a game, especially if you know the rules and they don't; at least you have a chance of winning once. At this evening meeting of the Gloucestershire group in the Great Western region, a group of junior teachers met to look at a set of Problem Solving and Investigational programs which was one of the last packs to come from the MEP Primary Project. The first program shown was *Colony*. With the odds at 23 to 2 we thought the teachers had enough in their favour without knowing the rules. It was three games before some grasped the idea; we then thought it was time to try another program. For this, we told them the rules of the game, but we still managed to win once, more by luck than judgement. After this the format changed into a workshop with the opportunity to explore other programs on the disc at their own pace. I noticed many were still working on the rules of the first game. I wonder how many will try this one in the classrooms in the way we introduced it to them? This disc of software is available from your local LEA advisor or Teachers' Centre.

Mary Oliver

For the Summer term 1988, we had planned two Saturday events. The Logo Workshop is a long-standing event and attracts teachers from as far afield as Cardiff, London and Liverpool! Even so, the lack of local teachers meant that this event attracted only 25 teachers. (Could this have been due to the Cup Final being played the same day?)

The other Summer term event was supposed to be our 'biggie', with the power of the microcomputer being used to supplement the 'Creative Arts'. On the day, only 20 teachers turned up. Andy Pierson explained that his program *Compose* was intended to make musical experiences more accessible for teachers and pupils by cutting down on the expertise required to play a musical instrument. Fairly soon, he had everyone singing, clapping and playing impromptu instruments. He only stopped short of getting everyone to dance because we got to a coffee break! A period of time was then set aside for people to use various tune files on the BBC or RM Nimbus computers.

The second session was led by Stan Giles, a fourth-year B.Ed. student at the College of St Paul and St Mary, who explained how he had used *AMX Art, Superart* and *Image* with less able lower junior children. Stan showed us examples of how the children's work developed from pencil drawings through to several drawings made using the computer via a mouse. He showed how each child had maintained his own individual style throughout and pointed out that the children changed their drawings more often when using the computer, because 'rubbing out on the paper leaves nasty marks, whereas cleaning an area of the computer screen doesn't'.

The teachers were then given time to use various art programs on both BBC and RM Nimbus computers.

For the remainder of the day, teachers chose whichever program they wished to play with. Many discovered that these tools are easy to use and will now be pressing LEA advisers to buy licences for this type of software.

Everyone attending these two days seemed to go away happy. Well, nearly everyone. We, as a MAPE Committee, had put a lot of effort into organising such days and, like many other local MAPE Committees, feel that the effort involved is becoming disproportionate to the number of teachers who turn up.

I would welcome answers from members to the following questions:–

1. Are Saturdays not good days to hold events on?
2. Are Saturdays in the Summer even worse?
3. Are early evening events preferred?
4. Apart from beginners' evenings, what type of topics would you attend?
5. Has the LEA totally catered for your micro-computing needs?

These questions are intended to help us with future planning. The current programme of future events for Gloucestershire, all to be held at Benton Computing Centre, College of St Paul and St Mary, Cheltenham, is as follows:

Tuesday 15 Nov 1988 – 4.15 to 6.00 pm:
Christmas programs (food and drink!)
Tuesday 28 Feb 1989 – 4.15 to 6.00 pm:
Using your printer
Saturday 11 March 1989 – 9.30 am to 3.00 pm
Software Review Day
Saturday 6 May 1989 – 9.30 am to 3.00 pm
Annual Logo Day

Non-Gloucestershire and non-LEA teachers are always welcome. Teachers can send one SAE for each event, for a reminder three weeks before the event, to Mary Oliver, 3 Whitecross Square, Cheltenham, Glos GL53 7AY.

Reg Eyre

Southern

The MAPE Overseas Representative has ventured overseas and has earned her title. On Saturday 18 June Chris Robson really ventured 'overseas' in the name of MAPE (even if it were only a rather small sea) to the Isle of Wight. The first ever MAPE event to be held on the Island attracted some 30 teachers and that on a warm, sunny summer Saturday. Chris came to speak on the theme of using the computer with young children in the reception classroom. She demonstrated a variety of software until then unknown on the Island to a very interested and eager audience of infant teachers and then gave us all the chance to explore and play. This first event was a great success and was much enjoyed by all; such was the very real interest that an Island branch of MAPE has been formed and we are eager to build on this success.

Thanks to Chris for coming to the Island and to the Island MAPE members for their help, especially Sue Ash, Linda Cahill and Ralph Hodd.

In September the first Regional Committee meeting is called, and the first Regional AGM will be held sometime in the New Year (details later).

Other MAPE events are being held in Dorset and Berkshire on a regular basis; there will be a meeting in the Havant area before Christmas, and a second Isle of Wight meeting as soon as it can be arranged.

If you live in West Sussex or the Channel Islands and would like to help in organising and promoting a MAPE event, please contact me.

Now Chris has tasted the pleasures of travel 'overseas' (a chocolate ice-cream on Sandown seafront), I wonder where the next invitation will be?

Happy Christmas to all in the Southern Region.

Dave Kitching

East Midlands

Little did I realise when I joined the committee for East Midlands MAPE that I would be publicity officer for the region six months later! It has given me an insight into the hard work and planning necessary in order to put on the roadshow or day workshops for our region. It has however been lots of fun and my regional geography has improved immensely!

For the benefit of any members who are unaware of East Midland MAPE activities I will briefly outline the format. Each term a day workshop is held in one of the following four counties, Derbyshire, Nottinghamshire, Leicestershire or Lincolnshire. The day workshops provide opportunities for both 'hands-on' and discussion.

Before Easter the roadshow went to Derby and almost immediately after the Easter break it went to Long Sutton, Lincolnshire. Both events were well supported in spite of problems with the distribution of application forms. A wide variety of topics were presented which included Getting Started, Databases, Logo, Concept Keyboards, Music and Micros, and the National Curriculum to mention but a few. *Communitel*, Domesday and Archimedes were available for people to 'have a go', at coffee breaks and lunch time. (These proved very popular even though the grub was great!)

Future workshops
Please make a note in your diary now.

October 1 1988
Queningborough, Leicestershire
March 4 1989
College House Junior School, Nottingham
April 22 1989
Somewhere in Lincolnshire! Members and non-members are welcome at the roadshow.

For further details of these events, please contact:

Margaret Herbert
College House Junior School
Cator Lane
Chilwell
Nottingham
NG9 4BB
Tel 0602 257458

South West

If it moves it's fun!
This was the message from the Logo Workshop held by MAPE South West at Rolle College, Exmouth on 21 May.

Children naturally explore and want to control their environment. By making models, they develop skills to come to terms with that environment. Reg Eyre showed model vehicles, robots and planes made from scraps of wood and glue, made by children as young as six years old. For some children that in itself, with the planning and decision-making involved, is an achievement. But to make the model move by battery power; then to program the computer to control the model's movements, is a stimulating and highly motivating experience; not to mention the knowledge and skills which develop quite naturally in this journey from the planning to the performance.

Teachers who attended the workshop then had the opportunity to make models using a variety of kits and control them via the buffer boxes available.

Brian Hughes of Rolle College reminded the group that screen Logo is more than making pictures. He demonstrated how many mathematics ideas can be developed using Logo. The important factor is that the children should have plenty of opportunities to discuss amongst themselves, and with adults, the implications of what they are doing. Without it children produce pictures; with it they produce pictures and also use mathematical skills, concepts and ideas in a constructive and creative way . . . and this can start at infant level!

Teachers then had the opportunity in workshop sessions to use Logo, BigTrak and the Valiant Turtle and to see for themselves that control technology is a fun way to learn.

The MAPE South West group is planning a full calendar of events for the next school year. So watch out!

Judy Gale
Cullompton Junior School, Devon

MAPE South West Events for 1988/9

Saturday 12 November – 10.00 am to 4.00 pm
Ladysmith First School: Desk top publishing
Tuesday 3 January – 10.00 am to 4.00 pm
Rolle College: Devon licenced software
Saturday 11 February – 10.00 am to 4.00 pm
Venue?: Writing and the computer.
Plus AGM.
Saturday 10 April – 10.00 am to 4.00 pm
Venue?: Logo Workshop

Overseas

Many thanks to Dave Kitching for inviting me to talk at the first MAPE meeting on the Isle of Wight – it may not be *quite* overseas, but getting up at 5.30 on a Saturday morning, driving to Portsmouth and catching a catamaran to the island made it *feel* like it! The stroll along the beach in glorious sunshine, eating a dripping ice-cream all added to the illusion, and I look forward to the next invitation to go abroad!

It was good to meet colleagues from New Zealand, the Netherlands and the European Schools in Culham and Brussels at the MAPE Conference. If any of you are thinking of coming to next year's Conference in Gwent, drop me a line beforehand and I'll do whatever I can to ensure that you make the most of your visit.

Meanwhile the trickle of letters from members in all parts of the world continues; Jo Roger teaches in Discovery Bay International School in Hong Kong and has a familiar-sounding programme of PTA ventures to raise funds and in-service sessions with the staff. She was eagerly awaiting a visit from representatives of 4Mation and Sherston Software when she wrote.

Congratulations, also, to Class E5 of Piasau School, Sarawak, who scored 90% on *The Hobbit* before they were burnt by the red golden dragon. I'm most impressed since my best ever score is 19%! They've read the book, but still can't find a way to kill the dragon – can anyone help them?

Elsewhere in this issue you will find an article by Stellan Ranebo from Sweden, sent to me via TTNS in response to my earlier request for contributions. As overseas membership is now well over 100, including our first member in Sri Lanka, I'm sure there must be many articles out there just waiting to be written, so I hope *MICRO-SCOPE* readers won't have to wait too long before reading more overseas news!

Chris Robson

Berkshire

After unavoidable delays, our meeting on Desk Top Publishing finally took place in May. A small but enthusiastic audience watched a number of demonstrations from MAPE members Alan Harding and Mark Gunn before exploring the packages for themselves. We hope to hold another meeting before Christmas and Berkshire members will be mailed when this has been arranged.

Chris Robson

Ireland

This past year MAPE has organised some eight workshop-style evenings on a monthly basis in either Stranmillis College (Gray Horner's Pad) or in the Belfast Teachers' Centre at Queens University. These evenings attracted a regular group of some 20/30 teachers from the greater Belfast area. The immediate concern is to provide a better service for those members living on the outskirts of the region by establishing small groups in towns around the province. The committee are anxious to make contact with members in the Omagh, Craigavon, Ballymena and Bangor areas who would be interested in helping to form a local group. Anyone interested should contact the regional secretary, Mrs Rosemary Stevenson, Education Department, Stranmillis College, Belfast 9.

The year's activities climaxed at the Finals stage of the Annual MAPE Primary Schools' Competition sponsored by the Ulster Bank Ltd. This year nineteen schools qualified for the finals in Stranmillis College. Roger Keeling once again did a magnificent job in judging the superb range of entries – even if he was almost upstaged by four ducklings from County Tyrone!

Killard House School won the Special Schools' section and took the overall prize of a Master Compact Computer for their project 'On the Farm'. The other section winners who each took an Epson Printer back to their schools were:

- Lisbellaw Primary School (Infants section) for 'Houses and Homes';
- Orangefield Primary School, Belfast (Primary 4/5 section) for 'Weaving';
- Mersey Street P.S. Belfast (Primary 6/7 section) for 'The Mersey Star'.

Our plans for the new school year include a 'Wine and Cheese Open Evening' in September to launch the autumn programme of workshops, and at which it is hoped to announce details of a weekend course/conference to take place early in 1989.

Pete Young

Stop Press!

Monday 5 December – 7.00–9.00 pm
Belfast Teachers' Centre: 'Adventures Evening'.

North West

The North West region is under way (again?) and has held two half-day 'Beginners' sessions: one on Saturday 12 March 1988 at Didsbury School of Education, Manchester Polytechnic; and the second, through the good offices of Steve Smurthwaite, on Saturday 18 June 1988 at Chester College. Various applications were covered – Logo, Information Handling, Control Technology, Wordprocessing and 'What is a Micro?'.

Both events attracted capacity crowds (30+) and after we had felt for so long that North West events were to be forever confined to Greater Manchester it was refreshing to have an alternative venue. If anyone in the any other part of the region could suggest other venues and/or events, please let me know.

An event for your diary is:

Saturday 5 November – 9.30 am to 12.30 pm
Didsbury School of Education: Computerise Christmas with MAPE.

A Saturday morning session on 'Early Learning and the Micro' is to be held in the Spring term 1989, venue to be arranged.

Profuse thanks must go to the many willing (?) members who made the events so successful and particular thanks to Ingrid Brindle (Treasurer) and Faith Mitchell (Secretary *not* Dogsbody).

David Whitehead

MAPE National Committee Members 1988

Chairman	Roger Keeling, Newman College, Genners Lane, Bartley Green, Birmingham B32 3NT. Tel: 021 476 1181 TTNS YLJ008
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OVERSEAS & FOREIGN
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It may be possible to accommodate some families

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