MICRO-SCOPE

ISSUE 28 AUTUMN 89

MAPE's response to D&T Proposals
To build a robot . . . Saxons Chaos!
P.E.N.C.I.L. Technology Portable Computers
Commodore AMIGA with *Deluxe Paint II*
Evaluating *Caption* Sisters, where were you?
MAPE Problem Solving Programs

NEWMAN COLLEGE WITH MAPE

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Editor Senga Whiteman
Assistant Editor Roger Keeling
Design David Barlow

ISSN 0264-3847

Correspondence to the Editor: *MICRO-SCOPE*, Newman College, Bartley Green, Birmingham B32 3NT. Tel: 021 476 1181

MAPE (Micros And Primary Education) is open to individuals and institutions. The current subscription of £12.00 p.a. UK, £16.00 p.a. overseas, includes direct mailing of **MICRO-SCOPE**.
Application forms from: Mrs G Jones, 'The Old Vicarage', Skegby Road, Normanton on Trent, Notts NG23 6BR.

Published by Castlefield (Publishers) Ltd.

Individual copies from: Castlefield (Publishers) Ltd., Newton Close, Park Farm Industrial Estate, Wellingborough, Northants NN8 3UW. Tel: 0933 679677

MAPE reference for Income and Corporation Tax relief on membership fee: T1644/23/1986/MT
Charity Commission reference: OSP-292898-R Reg. No. 292898
MAPE is sponsored by Microvitec and Research Machines

Produced by The Castlefield Press, Wellingborough.

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Evidence from MAPE

to the National Curriculum Council in response to the Design & Technology Proposals, June 1989

In July members of the MAPE Committee and some invited guests met in order to formulate a response to the IT element of the Design and Technology Proposals. The general feeling was one of great disappointment because the Proposals had failed, firstly, to build on the potential of the Interim Report, and secondly, to take into account current best practice in IT. The document we produced is reproduced here. The first section details the reasons for our disappointment. The second section comprises the questionnaire and our answers. The third section focusses on the differences between statements referring to IT in each of the core documents and highlights what we regard as omissions and mismatches in the D & T document. Our submission was also accompanied by two examples illustrating the way in which IT can support cross curricular links, one from the Northern Ireland D & T document, the other produced by MAPE. (This latter has been further developed and is included in this *MICRO-SCOPE* under the title *Classroom Guides*.)

Our response was sent to the National Curriculum Council in August. We await developments (we hope)!

* * * * *

Last September MAPE was pleased to forward to the Design and Technology Working Party our ideas for the integration of Information Technology within the Primary Curriculum. These were subsequently published in our journal and were extremely well received by members and other educational bodies. We are disappointed that the final Design & Technology proposals do not reflect the spirit of MAPE's evidence. Our concern is articulated in the papers enclosed with this letter. We have restricted our comments, in the main, to the Information Technology profile component with particular reference to key stages 1 and 2.

1. The first problem is one of lack of definition. When the framework for the National Curriculum was first put forward, Information Technology was (correctly in our view) identified as a cross-curricular theme. Yet the first paragraph of the proposals of the Secretaries of State (page iii) seems to imply that the foundation subject of Technology consists of two components: Design and Technology and Information Technology. This view of IT as a subject in its own right is incompatible with its identification as a cross-curricular theme. While elements of IT can properly be identified within other subjects, for example in Attainment Target 12 of the Science Orders, none of the five aspects of IT capability is the exclusive province of any one subject. The special consideration given to IT by the Design and Technology Working Party should have resulted in a framework for the delivery of IT as a cross-curricular theme through the other subjects of the National Curriculum. This task is well achieved by the Report of the Cross Curricular Working Group on Information Technology in Northern Ireland. By comparison, Chapter 3 of the Design and Technology Working Party report is a lamentable failure. Given this ambiguity, it is vital to define what is meant by IT at the outset, and so provide the clarification which is necessary for considering the report.

2. The second problem concerns a serious omission in Chapter 3. Whilst we accept the concept of one attainment target divided into the five subheadings in paragraph 3.5, only three of these areas have been expanded on. The report says, 'we concluded that **measurement and control** and **the ability to make judgements about applications of IT** were more appropriately placed within the design and technology attainment targets and programmes of study' (para 3.6, pg 73). These two areas are in fact largely absent from Chapter 2; we strongly recommend that either all 5 areas are fully documented within Chapter 3 or that the two areas from Chapter 2 receive fuller and more explicit treatment. We strongly favour the former option. Our comparison of the Design and Technology Proposals with the Report of the Cross Curricular Working Group on Information Technology in Northern Ireland reinforces our concern. The latter makes specific references to '**measurement and control**' and to '**applications and effects**'. Four illustrative examples are given below that highlight this difference in approach.

The Northern Ireland Report states (at level 2):

A. '*Pupils should be able to control a device directly by giving a sequence of commands and understand that the device is under the control of the pupil.* The example given is '*to control devices such as buggies and floor turtles with joysticks, switches, one-key Logo etc.*' This is in marked contrast to the D&T Proposals (level 2) where it is suggested that programmable toys should be used to produce effects such as sound. This does not reflect current good practice in the use of programmable devices and is not the prime purpose of using such devices in the classroom.

B. The Northern Ireland Report builds upon this foundation at level 3. It refers to the creation of a short sequence of instructions to control a machine or device (eg. driving a floor turtle round a maze).

C. At level 4 pupils are encouraged to be able to build a system which uses a switch or stored procedures to control a device directly (as in burglar alarms, automatic gates and traffic lights).

D. Level 5 leads on to the use of sensors to detect changes in the physical environment and the measurement of physical quantities over a period of time, and quotes the example of using a sensor to measure temperature or light levels in weather data recording.

These examples, together with the clarity of expression, give a very clear line of development for **measurement and control**. Such clear references do not appear within Chapter 2 of the D&T Proposals. It should be noted that work of the type illustrated above is already accepted practice in many of our schools. The National Curriculum should recognise this excellent groundwork and build on it.

3. The third point is that the Information Technology section of the report fails to recognise the issues dealt with in Curriculum Matters 15. Thus the Proposals do not reflect the cross-curricular nature that should be inherent in work encompassing IT. There is a danger that the terminology used could be interpreted to suggest that at primary level, IT is a subject within its own right.

The three examples quoted below illustrate this point:

a) '*know that IT can be used to store and retrieve information*' (level 2, pg 76)
b) '*pupils should be taught that software can be used to store, modify and retrieve information in the form of text, number, images and sound*' (level 2, pg 79)
c) '*identify facilities and limitations of database software and other packages*' (level 6, pg 77)

In these examples no reference is made to the curricular context in which the pupils should be working. Without such detail, IT could become compartmentalised. In particular, consider example a) above. The purpose of using a simple word processor is not to 'store short sentences and retrieve them later'. It is to enable children to improve their writing through successive drafts – a purpose which goes far beyond the mere storing and retrieval of text.

MAPE believes that the report sets a very low base line for teachers, because it is neither challenging nor structured. (For example, the suggestion of writing a LOGO procedure to produce repetitive patterns on the screen (level 5, pg 76) is not preceded by any reference to LOGO at earlier levels.) The Report appears to be resource led rather than reflecting the needs of a dynamic curriculum. It offers little incentive to well informed and experienced teachers who have access to a reasonable level of equipment. Many of their pupils are already using the technology to achieve educational aims well beyond that specified at level 5. Teachers are looking for guidance on the delivery of IT as a properly developed and coordinated cross-curricular theme. This is not present in the

report and represents a missed opportunity. Whilst the report notes the escalating rate of technological change, its ATs do not reflect this. They are pedestrian rather than bold. There is no mention of the potential of emerging technologies.

The programmes of study are very disappointing. They are virtually interchangeable with the attainment targets. Effective programmes of study should lead into attainment targets. Consider the following:

Attainment level 1 states:

> '*Pupils should know that IT can be used to present information in a variety of forms*'.

The corresponding programme of study states:

> '*Pupils should be taught that information can be held in a variety of forms (for example text, number, sound, images) through experiencing such forms recorded and communicated using information technology*'.

It is difficult to comprehend how any teacher could use this statement to achieve the attainment target. In particular, the programmes of study should emphasise the practical nature of the work that is essential at key levels 1 and 2. There is too great an emphasis on the requirement of 'knowledge' rather than on activity and experience. We would urge greater emphasis being put on the use of such alternate input devices as the concept keyboard.

Concern has also been expressed over the distinct mismatch between the levels of attainment in the D&T document and those of the reports of the other core subjects. For example, the level 3 statement of attainment advocates that pupils '*should be able to enter, select and retrieve information in a database whose structure has been prepared in advance*'. The corresponding levels in English, Maths and Science make no reference to a prepared database. In fact they suggest that devising the structure of the database is an integral part of the educational process.

To summarise, MAPE is disappointed by the lack of definition, clarity and structure in the Design and Technology document. We are seriously concerned by the fact that educational issues are misrepresented. The NCC must address these issues in their response.

Design and Technology Response Form

In this section we have replied to specific questions from the response form, and, in most cases, have restricted our responses to key stages 1 and 2.

A2 *Whether you agree with the proposal to accept the 1 attainment target for IT.*

A2 Whilst we would accept the notion of one attainment target for IT, we feel that this should reflect all of the five IT areas described in 3.5 rather than only three. We are concerned, however, that inclusion of the IT attainment target within Technology does not reflect the position of IT as a cross-curricular theme.

A3 *Whether each of the 5 attainment targets is sufficiently clear.*

A3 The AT/IT is sufficiently clear in itself, but should be expanded in light of the comments above.

A5 *Whether the division of IT capability between the two profile components (para 3.6) is satisfactory. If not, how should it be revised?*

A5 The division of IT between two profile components is not satisfactory. It does not engender a holistic approach to IT as a 'cross-curricular theme' and does not form a sensible basis for the delivery of IT through the core and foundation subjects. Revision as suggested in A2 would be appropriate. A suitable form for the AT/IT might be: '**Pupils should be able to use IT appropriately, confidently and sensibly to communicate and handle information in a variety of forms, to design, develop and evaluate appropriate models of real or imaginary situations, to measure and control a variety of environments and to recognise the effects of Information Technology on themselves, on organisations and on society.**'

A6 *Whether the 4 attainment targets in the design and technological capability profile component with their associated programmes of study adequately cover the range of design and technological work currently undertaken in the 5 subjects identified in the report (namely art and design, business studies, CDT, home economics and IT).*

A6 With respect to IT, the range of activities described in chapter 2 does not cover all of the work currently undertaken. The report itself states that only two of the components of IT are contained within the four attainment targets of Design and Technology. Even within these two areas, it is hard to find specific IT statements that either cross-reference with attainments from the other core subject reports or which use current good practice as exemplars. References to the Applications and Effects of IT are even more tenuous.

A7 *Whether any of the five proposed attainment targets should be combined or subdivided and, if so, how?*

A7 The AT/IT could usefully be subdivided, perhaps by using the 5 areas of IT as a basis with statements of attainment at each level for each IT area. Such an approach would form a more secure foundation for the work of core and foundation subject groups.

A8 *Whether the attainment target in the IT profile component is sufficiently comprehensive.*

A8 As indicated in the above comments, the IT profile component is not felt to be sufficiently comprehensive, because of the fragmented way in which it is presented. Examination of the D&T ATs and PoS shows that aspects of Information Handling appear more frequently than aspects of Applications and Effects. Incorporation of all five areas into the IT attainment target would enable all aspects to be incorporated, with appropriate levels of emphasis, into all core and foundation subjects.

B1 *Whether the statements of attainment are sufficiently comprehensive. If not, what further statements of attainment should be added? If, on the other hand, they are already too numerous, which should be omitted?*

B1 Whilst the IT ATs are reasonably comprehensive, given the AT/IT as defined, this is not the case for the two areas of IT encapsulated within the D&T section. The suggestions made in section A would resolve this problem.

B2 *Whether the statements of attainment are sufficiently clear and distinct to support the attainment targets to which they relate. If not, how should they be amended? If they are already too specific, how should they be made more general?*

B2 Since the AT refers to the need for pupils to '. . . *be able to use IT* . . .' we are concerned that the proposals for levels 1 and 2 do not emphasise the practical activity needed to achieve this aim. There is too great an emphasis on the expression 'to know that' leading to a view of the curriculum in terms of knowledge rather than in terms of activity and experience. This does not seem to fit the practical tenor of the national curriculum as a whole.

B3 *Whether any particular statements of attainments within a single attainment target are set too high. If so which, and how should they be amended?*

B3 Although the statements of attainment are not set too high, there are a number of cases where an attainment is introduced which will require appropriate work in earlier stages if pupils are to attain the level required.

B4 *Whether any particular statements of attainment within a single attainment target are set too low. If so which, and how should they be amended?*

B4 With regard to the AT/IT, we feel that this is certainly the case and that many of the proposals have been determined on the basis of available resources rather than on the capabilities of pupils. Even within the resources currently available, many of the activities suggested for levels 7 to 10 have been successfully attained by pupils in Primary Schools. The progression ought to be in terms of the application of IT in a more complex context. This might best be achieved through contexts set within appropriate levels of attainment in the core and foundation subjects.

B5 *Whether there is progression from level to level within each attainment target.*

B5 Whilst there is progression in some areas (eg. Data Handling), in other cases (eg. use of LOGO at level 5) activities are introduced without guidance on appropriate previous experience.

B6 *Whether there is consistency of levels across different attainment targets.*

B6 There appear to be significant differences in the levels of attainment shown for IT and the levels at which these IT tools are used in the Mathematics, English and Science documents. This situation will continue in the foundation subjects unless the format of the IT section is modified to provide a clearer basis for implementing IT across the curriculum.

B7 *Whether the statements of attainment adequately reflect the programmes of study.*

B7 It is impossible to answer this question since the material presented does not, in our view, constitute a programme of study (see C5).

B8 *Whether the statements of attainment need further exemplification.*

B8 Yes – far more exemplar material needed, with cross-reference to all core & foundation subjects. This should not be a 'once and for all' activity but should be a framework within which suitable examples could continue to develop.

B9 *Whether the exemplification of the statements of attainment already given is appropriate.*

B9 There is an inconsistency of style and, in some cases, of level in many of the examples. This stems from the nature of the AT – a series of attainments for each of the 5 IT areas would enable considerable clarification in the presentation of exemplars.

B10 *Whether the statements of attainment within the proposed attainment targets are specific enough to provide a clear basis for assessment.*

B10 We would agree with the statement that the assessment of IT capability must be based on the ability to use IT in specific and appropriate contexts (3.2 and 3.8). Assessment, therefore, should be far more than seeing whether pupils are '*able to use IT to create, amend and present information*'. It would be more appropriate to assess pupils ability to '*use IT to create, amend and present information in order to communicate more effectively*'.

C5 *Whether the programmes of study and illustrative material in the design and technological capability profile component provide an adequate basis for teachers to develop schemes of work.*

C5 The material presented does not form an adequate basis for the development of schemes of work and is little more than attainment targets in a different guise. This form of presentation could easily lead to teachers developing schemes of work specifically intended to deliver the IT attainment target in isolation. The place for IT is surely within schemes developed to deliver all of the core and foundation subjects. What is needed here is a framework to enable this to happen rather than statements which do little more than reiterate the attainment targets. The approach of the Northern Ireland group looking at '**IT – a cross-curricular theme**' exemplifies one suitable approach and we would value the opportunity to provide further examples of how this might be achieved.

D1 *Whether the two proposed profile components should be combined or sub-divided and, if so, how?*

D1 Since the AT/IT is, presumably, to be delivered through work in all core & foundation subjects, it should remain separate from the D&T profile component. The IT profile component should, though, reflect all 5 areas of IT.

D2 *Whether you agree that, in order to attain a particular level within any one attainment target, a pupil must reach that level on every statement of attainment within that attainment target (para 4.22).*

D2 Yes.

D4 *Whether the advice given in the Working Group's commentary on assessment is sufficient to give an adequate basis for assessment (chapter 4).*

D4 We welcome the general approach to assessment, in which IT capability is assessed within a relevant context (4.19). There is insufficient guidance as to how the assessment of the various components of the AT/IT can be delivered through a cross-curricular approach to IT.

E5 *Whether you agree with the sections of the report on gender (paras 1.41–1.43, 3.13).*

E5 Yes.

E6 *Whether you agree with the sections of the report on ethnic minorities (paras 1.44–1.46, 3.13).*

E6 Yes

E7 *Whether you agree with the sections of the report on special educational needs (paras 1.32–1.40, 3.12, 4.27–4.32).*

E7 Yes.

E8 *Whether you agree with the Working Group's suggestions on links to core and other foundation subjects (paras 1.10–1.13, 3.3, 4.19).*

E8 Links to the core and foundation subjects are fundamental to a cross-curricular approach to IT. Although we welcome the flexible approach to the setting of IT assessment in suitable curriculum areas, and the statements in 3.3 and 4.19, there are no references made within the details of the IT AT's and PoS. This is not a sufficiently adequate framework on which to base the coordination and assessment of IT across the curriculum and does not provide a suitable basis for use by working groups in the other foundation subjects.

E9 *Whether you agree with the Working Group's suggestions on the scope for including cross-curricular themes (paras 1.24–1.30, 3.2).*

E9 IT is itself a cross-curricular theme. As well as contributing towards the delivery of all subjects, it has a role to play in enabling certain aspects of other cross-curricular themes, such as economic awareness. It would, however, seem appropriate to include suggestions regarding ways in which IT can aid the development of such themes. The statement regarding the importance of IT in enhancing learning and in the development of a wider range of teaching and learning styles is welcome but should, we feel, be given greater emphasis.

The role of IT as a cross-curricular theme is, however, becoming confused by the inclusion of part of IT within Design and Technology and its inclusion in the 'subject' Technology. This must be clarified if schools are to successfully plan for the cross-curricular implementation of the AT/IT.

F1 *The implications of the proposals for curriculum organisation.*

F1 The suggestions made emphasise the need for whole school planning for IT and the active involvement of senior management, along the lines developed in Curriculum Matters 15 (Information Technology from 5 to 16).

F2 *The resourcing, staffing and time implications of the proposals.*

F2 The proposals regarding IT are more easily attainable in terms of time implications if they are an integral part of the schemes of work developed in order to deliver the core and foundation subjects. In order to deliver the IT ATs (including sections (iv) and (v)), the present level of resourcing will need to be increased and schools will need access to a wide range of microelectronic devices, computers and associated peripheral devices.

F3 *The in-service and initial teacher education implications of the proposals.*

F3 We must be ready to respond to the increased in-service needs which will be generated by the implementation of this report. The current reductions in the ESG (IT) programme give rise for concern that these needs may not be given the priority required in order to implement IT effectively across the curriculum.

F5 *The implications for co-ordination and collaboration between teachers (e.g. Annex para 3 and following).*

F5 We would generally agree with the sentiments of this section (see also F1). We would also like to draw attention to the need for cooperation across phases, with particular reference to the primary/secondary transition.

A response to question F1 on the Response Form

The implications of the Proposals for curriculum organisation

There were high expectations that the Design and Technology Working Group would provide a framework for integrating IT into the core subjects. We very much regret the fact that this opportunity has been missed. We believe that teachers would welcome guidance about using IT to develop skills in other areas, and clear statements that would ensure an ordered development of IT competence.

The D&T document does not give enough evidence to support and enable good practice in the primary school, and there are references that could positively encourage inappropriate use. We are particularly concerned to note that examples lack a developmental context. There should be a consistent reference to a strand of activity throughout the levels and across appropriate ATs.

In each of the core subjects there are certain Attainment Targets which demand the use of IT either to enrich the curricular content or to facilitate curriculum organisation. However, it is only in the Science Orders that such use is clearly specified. Indeed, the use of Information Technology is seen as sufficiently important as to warrant an attainment target of its own. (AT. 12 'Pupils should develop their knowledge and understanding of information transfer and microelectronics').

There are several positive statements for key stages 1 and 2 within the programmes of study for Science for the use of Information Technology. These statements support the idea that computers enhance the delivery of the science curriculum. For example, key stage 1, levels 1–3 states '*In order to supplement their first-hand experience, they should be introduced to books, charts, pictures, videos and the use of computers,*' and '*Children's normal work in all areas should involve where appropriate the use of information sources and computers.*' These references to IT continue in key stage 2, levels 2–5 which states '*Children should use the computer to store, retrieve and present their work, and Children should have the opportunity to use and investigate the transmission and storage of information using computers, sensors and the telephone.*'

Unfortunately specific referrals to IT are not continued in the Mathematics and English Orders. In the example that follows we illustrate, for the **Mathematics Orders** (levels 1–5), some of the missing links which we hoped would be highlighted by the Design and Technology Proposals. Although there are many occasions upon which the use of IT would offer an alternative approach we are focussing only on those ATs within which IT should play a crucial part.

AT1, level 2, *ask and respond to the question: 'what would happen if . . .?'*

The use of programmable toys, and the floor turtle, provide an ideal opportunity for undertaking an investigative approach which arises naturally, in a meaningful context, and offers an opportunity for independent learning.

AT1, level 3, *make and test predictions*

Once again, the use of programmable toys, and the turtle, can provide opportunities for such activites and, indeed, can offer a progressive framework.

In addition, many teachers have difficulty in finding activities which involve 'making and testing predictions', and by using appropriate software and peripherals this difficulty can be alleviated.

AT11, level 1, *state a position using prepositions such as: on, inside, above, under, behind, next to, etc. and give and understanding instructions for moving along a line*

The use of concept keyboards, one-key Logo and programmable toys all offer a comprehensive environment for such activites.

AT12 – *Pupils should collect, record and process data*

Although the use of a computer is included at levels 4 and 5 we believe that IT can play a vital role at all levels. For example, at level 1 pupils could use a branching sort program and this would support the development of a logical approach. The other levels could then build upon and extend the use of this application. Not only would this enhance the development of mathematical abilities it would also contribute to a heightened awareness of one of the main applications of IT.

AT13 – *Pupils should represent and interpret data*

This links with AT12 and the comments above also apply. In addition, the use of IT can redress the balance between representing and interpreting data. Currently an unjustifiable amount of time is often spent on representation (in drawing graphs etc) to the detriment of interpretation.

The above comments represent some of the missed opportunities within the Mathematics

Orders. Unfortunately, the D&T Proposals do not serve to strengthen the curriculum by highlighting and complementing these omissions.

A comparison between the IT proposals and the English Orders (levels 1 to 3) reveals a lack of consistency in learning styles and teaching objectives. The IT Attainment Target does not reinforce the notion of positive learning which is present in the English Orders.

The IT Attainment Target at level 1 implies children taking the role of a passive observer '. . . know that . . .' rather than the active involvement of children listening, speaking, reading and writing which are contained within the English AT's at a comparative level. IT AT level 1 should read 'be able to use computer generated images, words, phrases or sounds to communicate meaning for identified learning purposes.'

The IT Attainment Target at level 2 implies a mechanical, isolated activity – 'store and retrieve information' – and ignores both context and purpose. Contrast this with the statements within the English ATs, levels 2 and 3, which have a different emphasis. The words used (participate, respond, interact, describe, structure), all represent the child as an active learner. IT AT level 2 should read 'be able to select and use IT resources to support an activity which might involve the use of images, text, or sound'.

The first statement of of IT Attainment Target, level 3, does not follow a logical progression from the preceding two levels because it assumes a high level of IT competence which has not been developed. The second statement, regarding the use of databases, gives grounds for considerable concern because it ignores the fact that present good practice suggests that children should be actively involved in the organisation and design of an investigation. Therefore the questions raised by the children should be an integral part of the activity. The second statement at level 3 should read 'be able to contribute to the initial formulation of questions, the subsequent organisation of the investigation, the gathering and entering of data and its later retrieval and analysis'.

We had hoped that the D&T Proposals would match, cross-reference and supplement the Orders of the core subjects. This has clearly not happened.

A Guide to IT and the Core Subjects

MAPE National Council

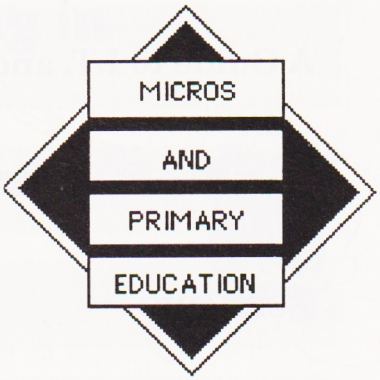
No doubt by now you will have had a chance to digest the Design and Technology working party report and in particular those aspects which deal with Information Technology in the primary school. The general reaction to the proposals has been one of disappointment. Apparently the financial implications of legislating a curriculum which requires heavy technological resourcing have proved too great for the present government to contemplate.

Whilst we share in the general disappointment and see the report as a missed opportunity we believe that primary schools will continue to ask not 'what can the National Curriculum do for IT?' but rather 'what can IT do for the National Curriculum?' With this in mind we have decided to launch a series of 'Guides to IT and the Core Subjects' which aim to illustrate the role that IT can play.

For each guide we have taken a typical scenario involving IT which you might expect to find in any primary classroom. From this we have imagined a range of IT related activities in which various groups of children within the class might be engaged with different groups operating at different levels within the same class. We have then analysed the various attainment targets being worked towards and the specific points within those as detailed by the statutory orders. As an example of this the reference 2.3.1 would indicate attainment target 2 level 3 point 1.

In the case of the science scenario we have not included the English Attainment Targets as details have not yet been released for levels 4 and 5.

A Guide to I.T. and the Core Subjects



Main Focus ENGLISH

SCENARIO

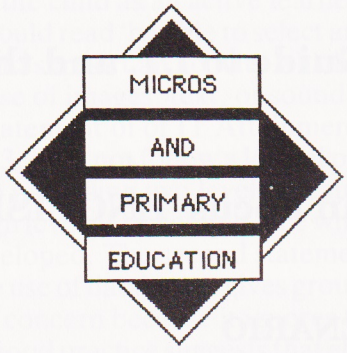
A collaborative writing activity as a follow-up to a visit to a farm. The teacher of a year two class has produced several overlays for use by children of differing abilities. The more able children will be encouraged to make as much use of the QWERTY keyboard as possible so as to extend the language they use. She has the use of a computer, concept keyboard and printer for one week. The children will work in small groups to produce a factual account of their visit. They will share their reports with other groups who will be encouraged to highlight ommissions. The children will then be given a further opportunity to edit their work which will then be printed and used in their project books.

ANALYSIS

Description	AT's	Level	Statements
• One group of children are gathered around the computer, they are taking turns in telling each other what they wish to write.	English AT1	1	1
• Another group of children are discussing and agreeing what they wish to write.	English AT1	2	1, 2
• Another group of children are discussing their first draft with the teacher before going back to edit their work.	English AT3	3	5
• A group of children are using picture clues on the overlay to display words on the screen which they then read.	English AT2 English AT3	1 1	1, 2, 3, 4 1
• A group of children are using an overlay selecting words to build up sentences	English AT2	3	3, 4, 6
• A group of children are producing a report based on their observations of familiar materials and events in the environment.	Science AT1	1	1, 2

A Guide to I.T. and the Core Subjects

Main Focus SCIENCE



SCENARIO

A Y5 class are using a data-base as part of their work on rubbish. Members of the class work at levels 3,4,and a few at level 5. They have access to a microcomputer system (with printer) at the end of each day. The aim is to monitor the contents of each classes' waste bins together with the playground litter over a period of six weeks; to make their findings known to each class on a regular daily basis in the hope of modifying the behaviour of the pupils. The class has previously worked on the properties of materials; they understand biodegradables; they have set up experiments to find out what will rot and what does not and what can be recycled. The project intends to reinforce and consolidate this knowledge.

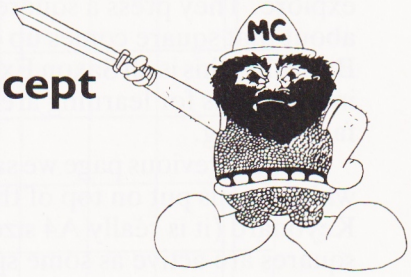
The use of the computer data-base enables the class to gain immediate feedback from the data and through a selection of graphs/presentations to create a persuasive argument to change the childrens' behaviour in their attitude to rubbish.

ANALYSIS

Description	AT's	Level	Statements
• A group of children are sorting and classifying the rubbish they have collected from the other classes. They are recording their findings onto a data capture sheet which they designed.	Science AT 1 Science AT 1 Science AT 5 Science AT 5 Maths AT 12 Maths AT 12	3 4 4 5 4 5	6 5 1 2 1 1
• A group of children are using a data-base and entering data relating to the rubbish which they have sorted and classified.	Science AT 12 Maths AT 12	3 3	1, 2 1, 2
• A group of children are printing graphs, bar charts and pie charts showing the results of one day's rubbish analysis. They are discussing their results.	Science AT 12 Maths AT 12 Maths AT 12 Maths AT 13 Maths AT 13 Maths AT 13	3 4 5 3 4 5	3 2, 3 3 1 2, 3, 4 1, 3

At the time of going to press the English AT's have not been published above level 3 and are therefore excluded from the analysis.

Saxons, alive and well and living in East Genes?



Exploring the Saxon World with the Concept Keyboard and *Touch Explorer Plus*

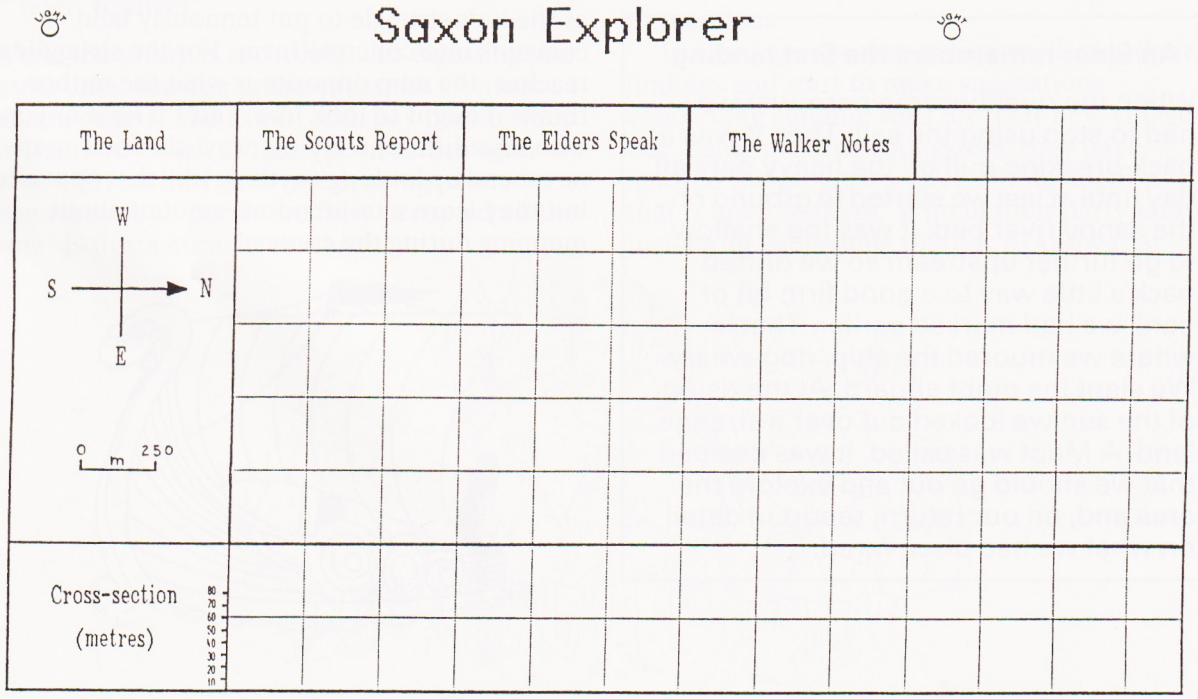
Martin Clarke
Advisory Teacher (IT), Leeds

Let's face it, the Saxons are all dead but the study of them remains as fascinating as ever to us teachers. Perhaps they are really alive and well and living in East Genes? It's an idea, but not one guaranteed to excite the young Saxoneer! Meanwhile, back at the forest boundary, we encourage the kids to sift through the evidence concerning Saxon life. We would like them to put themselves in the place of Saxon characters, to make Saxon-like decisions from a Saxon world view; in short, we want them to empathise.

So how do we start? With a siting game/exercise which asks the kids to put weighting values on the major subsistence resources? Very few of the pupils I have taught have ever tried to carry a bucket of water for 200 m. How about felling a tree, digging up the roots, cutting up the trunk, carrying the whole lot for a kilometre or so? Not very Green, is it? There are limits to this empathy lark after all. We are thrown back inevitably into time-honoured attempts to stimulate the imagination. Imagination? Ah, now there's a funny thing.

You see, I am a dreamer of landscapes. I can't be walking on a hillside or along a terraced street without thinking 'Yes, but what was it like *before*?' Before what, you say? Before the clearance of the lowland forests is the one in my mind, the pre-Saxon landscape of forest, marsh and apprehension. What must it have been like for those small groups of Saxon settlers who, having left their homeland and with a tough crossing of a dangerous sea behind them, found a willow scrub reception committee waiting and the forest wall hiding the land?

Well, there's this thing called a Concept Keyboard. It is a flat A4-size tablet with a touch-sensitive surface which is organised into a grid of 128 squares and you plug it into the user



port of the computer. With a great piece of software called *Touch Explorer Plus* it is possible to create a hidden landscape for kids to explore. They press a square and information about that square comes up on the screen. Basically, this is all Saxon Explorer does but the implications for learning are a little more far-reaching.

On the previous page we saw the printed sheet which pupils put on top of the Concept Keyboard (it is really A4 size). Not all of the squares are active as some space is needed for information purposes eg. the area showing direction and scale. The areas called 'The Land', 'The Scouts Report' and 'The Elders Speak' are Control squares which are used for switching between levels of information. If this means nothing to you, don't worry, read on.

To begin with, this material is not a replacement for more conventional approaches to teaching about the Saxon World. It is envisaged that it would take its place alongside the study of farming, housing, social structures and the analysis of documentary and archaeological evidence which would be under way in a typical Saxon classroom. One group of five or six pupils would be working with the computer whilst the rest of the class, also in groups, would be following equally demanding paths using books, maps, documents, etc. So let us have a look at what the Saxon Explorer group would be up to.

To set the scene, the group read the short passage 'An Elder remembers the first landing'.

An Elder remembers the first landing

When the river became narrower we had to stop using the sail. Then it was a back-breaking pull on the heavy oars all day until at last we started to ground on the sandy river bed. It was too shallow to go further upstream so we drifted back a little way to a good firm bit of bank we had marked earlier. That is where we moored the ship, dog-weary. We slept the night aboard. At the rising of the sun we looked out over a strange land. A Moot was called. It was decided that we should go out and explore the area and, on our return, report in detail on what we had discovered.

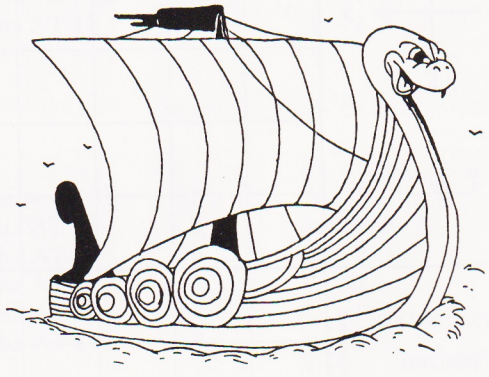
Their task is to produce a detailed report to the Moot on the suitability of the area for settlement. The report has to contain accurate maps as well as a full written submission and a speech justifying the selection of a village site has to be prepared. To achieve this efficiently the group splits into two parts, one to prepare a base map of the land and the other to map the major resource regions. Ultimately the second map is an overlay of the first, just as an O.S. map is made up of a series of overlays. The problem for the kids is in making organised sense of information which comes to them in tiny discrete pieces. It requires serious thought, develops ordering, cooperation, generalising and communicating skills and, above all, forces the group into *imagining* the landscape. The computer gives out no easy pictures. Kids of today are awash with images but here they have to make their own from the guidance available. It is a bit like radio!

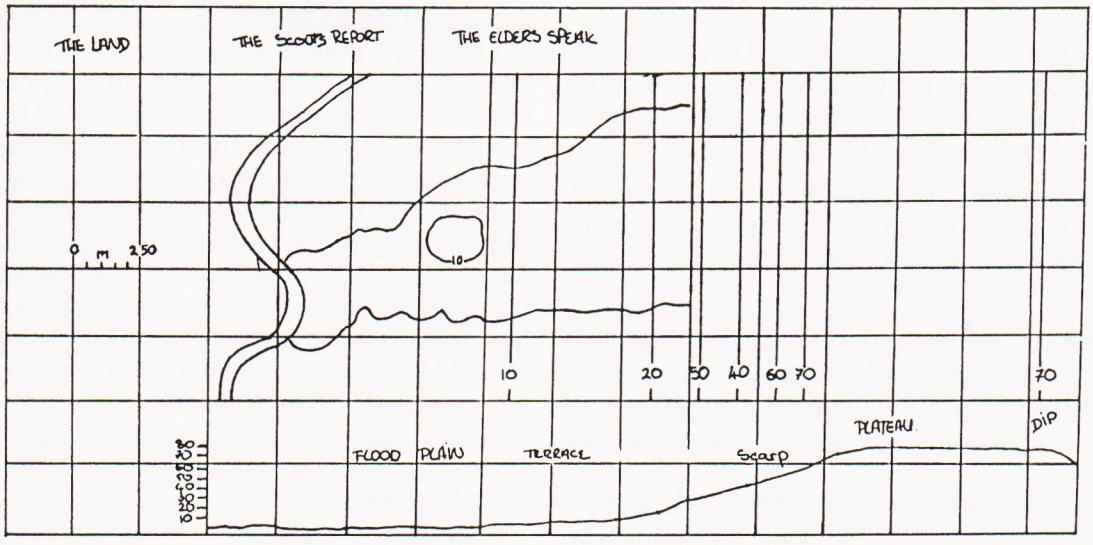
When the program starts, the pupils are at Level 1 which happens to be information about The Land, so pressing a square will give messages like:

Land rises to about 48 metres a.s.l.
There is a spring at just below 30 metres

KEYWORDS: ESCARPMENT SPRING

Pressing a square within the Cross-section area will give simple height above sea-level data. By exploring the overlay and recording the information on a copy, pupils are able to put together the wherewithal for the construction of a map! The ensuing exercise is liable to throw a cloud over the teacher's claim to have 'done mapping' as the kids struggle to put tenuously held concepts into concrete form. For the struggling teacher, the map opposite is what the author thinks it ought to look like, and I'll fight anyone who says different. By the way, the kids' maps never end up looking anything like that opposite but they learn a tremendous amount about mapping during the contest.





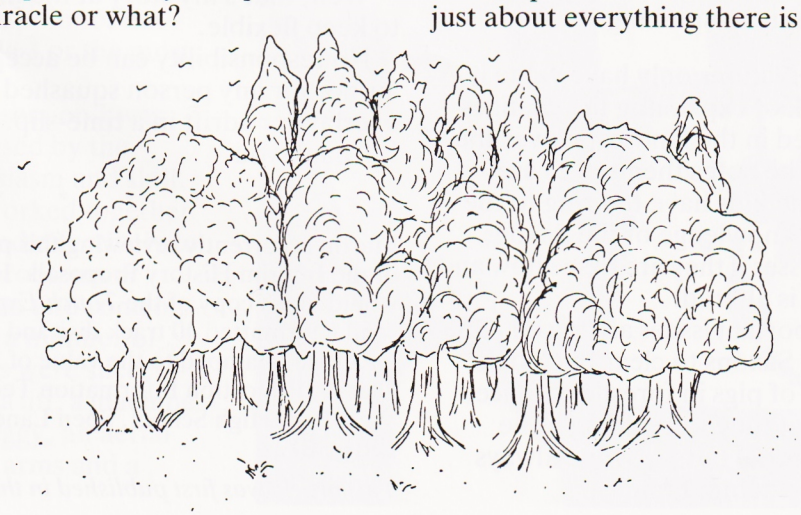
Meanwhile the second group are trudging through the ings, up onto the terrace and into the dark and rather frightening forest. Hey, wait a minute, how can they be doing this if the first group is using the concept keyboard thing, huh? I'm glad you asked that question and if you didn't then shame on you for not paying attention. What happens is this. To get information about resources a pupil simply presses the Control square called 'The Scouts Report'. Any square on the map area will then give messages of this type:

> 'Rich loam soil (mixture of clay, silt and sand). Oak-wych elm forest with hazel, hawthorn, holly underwood. Bramble. Sorrel. Boar, deer, squirrel.'

While the group is recording and digesting this latest data, the first group press the Control square called 'The Land' and, hey presto, they are instantly back to the type of information we have seen earlier! This interleaving of access ensures that all pupils are fully occupied all the time. Is this a miracle or what?

So the second group have an awful lot to do. Researching the trees and their uses alone is a mighty source of stimulating work but here we are dealing with a variety of soils of great significance to our low-tech Saxon incomers. And what of the relationships which may become apparent to the kids as they try to plot areas of like forest onto their map? Will they find trees and soils bound together geographically? Will they see the effect of drainage on the vegetation coverage? Will they begin to ask awkward questions? Who's been clearing the plateau of trees, anyway? Who indeed. The scope for research, for tying in knowledge gleaned in the other Saxon fields and for the formulation and presentation of conclusions is tremendous.

The two groups now merge to discuss their findings and start to make suggestions concerning suitable sites for their new village but, being modern youngsters, they have ignored the greatest source of information that is open to them. Who in their party knows just about everything there is to know that



is of any use whatsoever? You've got it. The Elders!

Back to the Concept Keyboard to press 'The Elders Speak' and get the lowdown, the distillation of years of valuable experience including pithy little admonitions like this:

> 'This may look good now but it will be flooded most winters. When it is dry the grazing will be good. If you plant crops here you'll rue the day, we can tell you that.'

The group now reconsiders its earlier judgements and makes a final decision. It can now finalise its presentation in preparation for the day when it will be called to the Moot to give account of its work.

I think the power of this material is that the kids have to explore it in apparently tiny chunks and yet each message is actually loaded to the gunwhales with information which has consequences for the child's next action. This makes it intellectually stimulating but still accessible to the less able. If you are interested in seeing Saxon Explorer or think that you would like to try it out with your kids next time you hit the Saxons, why not give me a ring on Leeds 782762? I would be delighted to hear from anybody who has managed to read this far!

Hold everything! This is the latest development of Saxon Explorer:

Catch the Time Plane!

When our little group of settlers found out that some smart alec had written an article about them they started to feel that they had a responsibility to their audience. They needed to show what a dynamic lot they really were.

Let us return then to that benighted spot some ten years forward in time bearing in mind that the word 'forward' has little meaning in the fourth dimension.

What we have got here is a Walker. We don't know much more about him except that he is literate enough to keep a diary as he walks along the paths and tracks. He is not a fool. He does not venture into the forest itself.

Neither does he write an awful lot. We are likely to get at most a few dispassionate phrases like these:

> Track follows stream uphill. No undergrowth near track. Narrow track splits off to west when elms stop. Stacks of oak braches. Dome-shaped mound, smoking.'

The Walker's observations only have value if pupils have the task of explaining the changes which have occurred in the landscape over the ten year periods. The notes themselves are simply pointers. The kids have to bring to the discussion all their knowledge of the Saxon world and its processes if they are to see how and why the landscape is altered.

A number of important issues are raised. One is the ability of the Saxons to clear thick oak forest and the role of pigs in forest clearance. Did they know what they were doing? The Saxons, not the pigs of course. Swine always know what they are doing, I find.

A second question is that of isolation. How well were these settlers connected to the world around them? Were they alone there in the great and frightening forest, prey to monsters and malevolent spirits? Many of our greatest Northern European tales would suggest that they were but archaeological evidence leads us to a different view. So, where exactly are all the tracks going? Why are some of them obviously better used than others? Where did that 8-metre sea-going mega-vessel come from?

Which brings us to the wider question of trade. By the way, the kids will look in vain for answers to their questions! They will just have to do a bit of research or, even better, make up a good story!

The aim of this level is to illustrate the processes of change in the landscape. Once these processes are understood, it is possible to make further projections with a reasonable chance of staying near to 'what really happened'.

Well, that's my story at the moment but I like to keep flexible.

No responsibility can be accepted by the author for any person squashed between overlays or adrift in a time-slip.

Thank you.

* * * * * *

Martin is currently reviewing this project in the light of the Interim History Proposals. However, if you would like a copy of the *Touch Explorer* files please send a formatted 40 track disc and a self-addressed envelope (stamped to the value of 30p) to Martin Clarke, Education Information Technology Centre, West Park High School, Spen Lane, Leeds LS16 5BE.

This article was first published in the Leeds IT News.

To build a robot . . .

Simon Hill
Windlesham House School, West Sussex

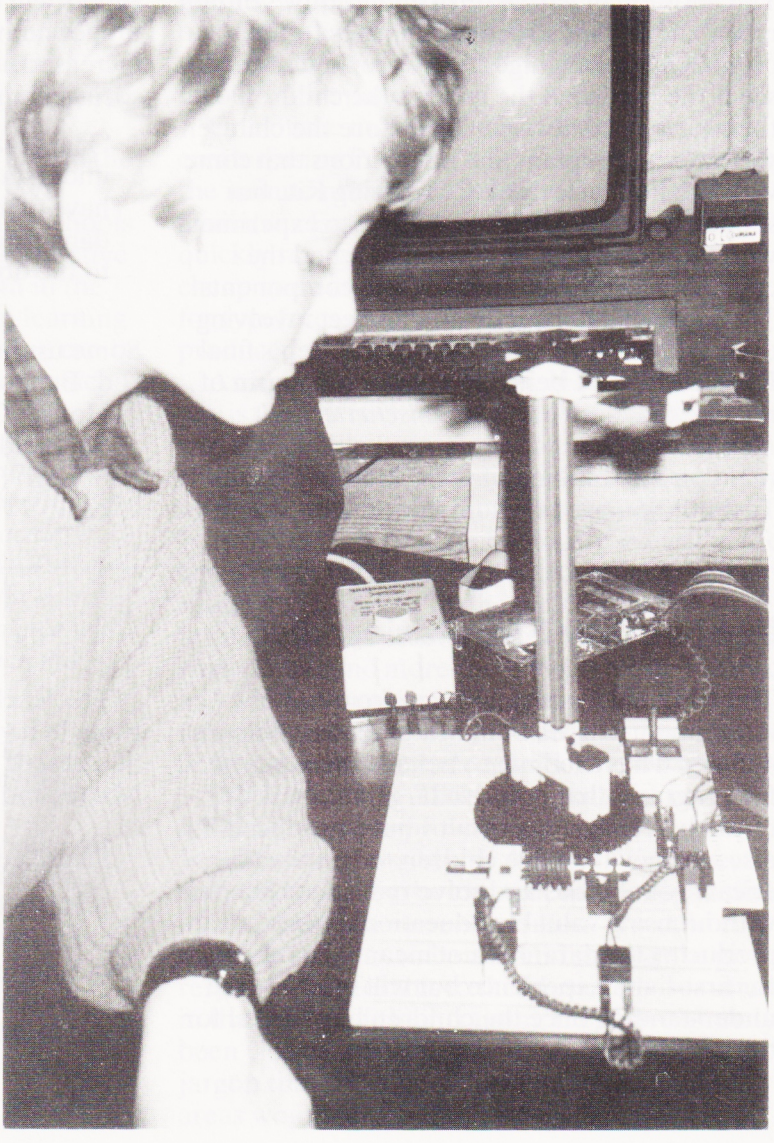
> 'The best way to learn how a car works is to take one to pieces and put it back together again. The best way to learn about robotics is to build and experiment with your own robot devices.'

This is a quotation from the 'Bible' of robotics, Richard Pawson's excellent and exhaustive study, *The Robot Book*. Thinking along similar lines, our Head of Craft, Design and Technology decided that the best way of responding to the National Curriculum's emphasis upon Control Technology for CDT was to ask an unsuspecting colleague (me!) to experiment with an Economatics 2000 kit the school had been given. The 2000 kit is a fairly comprehensive selection of Fischertechnik components that includes 6 volt main motors, gears, building blocks and various lengths of aluminium extrusion. To this was added two Computing kits, an interface and a power supply.

The result of my experiments was last term's Robotics Activity, involving seven children. It was run partly in their time-tabled CDT lessons and partly as an optional afternoon activity. I wanted to know whether children of Middle School age can build robots without too much adult help, so I made a point of not involving the oldest or the most able children.

From the first session I was pleasantly surprised by the children's enthusiasm and skill. In groups they worked together co-operatively and effectively to solve the many problems of robot construction and control. During the term a number of different projects were successfully completed: a lift, a machine tool, a simple buggy, an aerial rotor, two robot arms and a mechanical digger. When the initial construction phase was over, each model was wired up to the Acorn interface which in turn was linked to a BBC micro via a ribbon cable to its User Port. If the robot did not work at first, then the wiring was checked and, if necessary, modifications were made to allow the motors to function properly.

How much of the work was the children's own? Simply following the instructions that come with the Computing Kit cannot in itself be regarded as 'Design Work' or 'Technology'. However, we should not forget that for many children interpreting instructions and making



sense of technical diagrams are demanding processes – processes that may well be of value when they come to write their own accounts and produce their own designs. The children's ingenuity was certainly stretched when the instruction booklet was unclear or when the 'finished' model refused to work. Furthermore, the trial-and-error testing and the 'debugging' it entailed surely lie at the heart of what Control Technology should be all about.

Robot-building becomes creative after the instructions have been followed and the robot is 'finished'. It was at this point that the children themselves suggested improvements upon the original design, to enhance its capabilities or introduce new functions. In the case of the computer controlled machine tool, the children were dissatisfied with the axle that is supposed to 'represent' the drill: they wanted something that looked like a real drill and actually worked. Then there was the question of how the work-pieces arrive at the turntable to be machined. The addition of a 'real' drill and a conveyor belt meant significant structural changes to the original model, changes that were then tested to see if they satisfied the criteria the children themselves had devised. Therefore the children started with the plans and instructions that come with the Fischertechnik Computing Kit, but soon became both willing and able to experiment with their own designs, having learned the capabilities and limitations of the components. The mechanical digger was a project involving even greater development, the children's final Digger Mark VI being a very distant cousin of the one that appears in the *Fischertechnik Hobby Book*.

If you are thinking of using kits for Control Technology in your school, it would be wrong to imagine that Fischertechnik is the only possible option. Lego Technic have recently brought out a number of components that are most useful for robot construction and in fact the rival systems each have their own advantages. When using any kits with children, cost, durability and the availability of spares must be major considerations. With younger children, Lego Technic has the advantage that they have probably already played with it at home, whereas Fischertechnik is more durable and has a wider range of more sophisticated components. At Windlesham we now have some Lego Technic 1092 sets, together with the Lego interfaces and the Lego 'Lines' programs for our BBC micros. We are hoping to introduce Control Technology with Lego Technic lower down the school (perhaps for the ten or eleven year olds), with Fischertechnik for the older children in their final year.

What then is the value of Control Technology in our schools? As their mechanical dexterity, sensing power and intelligence increases, so robots will be capable of an increasing proportion of human tasks. The advantages of increased automation must be balanced by its social changes and the moral questions it raises.

> 'The greater the number of people who understand robots, the greater the chance we have of maintaining that balance, for the most dangerous science is the science constrained to the domain of experts.'
>
> (Richard Pawson, *The Robot Book*)

Some useful addresses:

Economatics (Education) Ltd., Epic House, Orgreave Road, Handsworth, Sheffield S13 9LQ.

Lego (UK) Ltd., Wrexham, Clwyd LL13 7TQ.

Probability Simulation disc

The National Curriculum requirements of Attainment Target 14 in Mathematics at levels 4, 5 and 6 have led me to believe there is a need for programs that produce large numbers of random events. As a result I have produced this disc which will enable children to test the theoretical probabilities and solve realistic problems without using valuable educational time producing the data. It is not meant as a substitute for first-hand experience but will enhance the understanding once the children have a feel for the activity.

The teachers who have seen the disc have thought it very useful. It is available through me at a cost of £5.00 including postage (BBC, Master and Master Compact versions available).

Please contact:

Betty Lumley,
Maths and Science Centre,
Kingston Lane,
West Drayton UB7 9ED
Tel 0895 446182

Whither the technology?

Geoff Strack
Advisory Teacher, London Borough of Harrow

Here in Harrow I have recently noticed that many of our teachers are encouraging the use of a revolutionary facility, available at a ridiculously low price from many well-known suppliers, namely a **P.E.N.C.I.L.**, this being the acronym for *Putting the Entire National Curriculum In Limbo*.

The cost of this revolutionary technology is such that it is possible to provide it, L.M.S. permitting, free to every child in a class. Eventually even the basic cost may be covered by encouraging advertising on them. One could foresee organisations extolling the equanimity of the Poll Tax, or the virtues of Cape apples etc. However, if we wish to encourage the discussion and co-operation that Seymour Papert considers so important then it would be important to restrict them such that children shared them one between two or possibly three.

The recent publication from the D.E.S. in the Curriculum Matters series, *P.E.N.C.I.L. Technology from 5 to 16*, sets out to help schools devise a coherent strategy for making effective use of P.E.N.C.I.L. Technology, both in the enrichment of existing subjects and in learning about the technology itself. Its relevance can be seen particularly in paragraph 13, from which I quote in full:–

> *Working with P.E.N.C.I.L. Technology can motivate, excite and give pleasure to pupils of all ages. Both boys and girls often achieve levels of expertise with P.E.N.C.I.L. Technology that surprise their teachers and themselves. There is a value in allowing competence with P.E.N.C.I.L. Technology to grow in the context of pleasurable learning.*

Eventually we could find ourselves in a situation where the Government provides funding for half of one per school. If P.E.N.C.I.L. Technology is to really take off and producing lasting changes in education, then some form of regional support would be required. A possible name for the organisation would be the Pencil Education Programme or P.E.P. This body of course would only be transitional since once the teams had built up a body of expert knowledge and experience it would be time for reorganisation. As we all know this would be ideal for creating an illusion of progress. At the same time this would enable MPs and other influential bodies to escape the rigours of an informed body.

If we consider further the advantages of P.E.N.C.I.L. over say *Folio*, then the most striking feature is the infinite number of typefaces that are instantly available. Furthermore there is no constraint as to the number of characters that you can have on any line. I already see the numerous possibilities of layout that children could experiment with using P.E.N.C.I.L. Technology. On one page they could have various line lengths, hanging paragraphs, different typefaces, justification off or on, and indented paragraphs. Instantaneously they would have an overall impression of the layout of the page.

One of the most significant features of work created using P.E.N.C.I.L. Technology must be the infinite number of individual styles that are available. Each child can see at a glance and quickly recognise his or her own work. The cheap and easy availability of different colours for typefaces enables wall displays to be produced that are exciting and varied.

An amazing feature of P.E.N.C.I.L. Technology is that there is very little restriction regarding space available for maintaining a record of the children's work. Constraints such as there being room for only 31 files on a disc are unknown. Using P.E.N.C.I.L. Technology it is easy to see when space is becoming limited and corrective action can be taken by the child or by the teacher. A major frustration with *Folio* has been when there is no more room available on the disc and a lengthy process requiring the learning of new skills and greater confidence by the teacher is demanded if the child's work is to be saved.

If P.E.N.C.I.L. Technology catches on each LEA will need to provide a team of Advisory Teachers and possibly an Advisory or Inspectorial post could also be created, or the responsibility attached to a current position. It would however, appear to be a sound strategy to give responsibility for this to the Music Adviser since in the course of their training they have already been closely associated with unique skills and jargon that colleagues from other curriculum areas would find an exciting challenge.

The team involved must be well versed in the issues of equity, since it would be essential that both the question of equal access by gender and multicultural implications are fully considered. The fact that P.E.N.C.I.L. Technology enables writing to take place from left to right and up and down the page must not be ignored. Unlike the situation with other devices there is no limitation to the range of typefaces that can be generated for languages such as Punjabi, Urdu, Japanese etc. For 1992 this could have wide implications for our performance in the European market.

Teachers would need to take special care to ensure that the use of P.E.N.C.I.L. Technology is not male dominated. We would hope that female teachers would be able to recognise themselves as role models and ensure that they exploit the use of this device to the full. It may well be that ways will need to be found to make P.E.N.C.I.L. Technology much more socially attractive for girls, particularly if we hope that many more of them will take up a career in this field. Customising the devices such that they are visually more attractive and emphasising the sociological aspects of P.E.N.C.I.L. Technology are further avenues for exploration.

Separate posts for Early years, Primary and Secondary support specialists would be required since as we all know there is little transfer in skills and knowledge between the different phases. Nevertheless we would need to ensure that colleagues from all curriculum areas take on the challenge of P.E.N.C.I.L. Technology and incorporate it into their teaching programme. In the secondary schools there could be a case for establishing P.E.N.C.I.L. Technology as a separate GCSE subject and as we have found in the past, non-availability of resources need not prevent this from happening. In time we may see organisations such as RSA offering awards for teachers and students with perhaps the eventual prospect of TVEI taking it on.

In-service training would be a major feature of any initiative of this kind and courses could be provided to teach the necessary skills for P.E.N.C.I.L. Technology. Cost could be a limiting factor here but this could perhaps be overcome by careful planning and the incorporation of suitable exercises with P.E.N.C.I.L.s on Baker days.

Headteachers would initially at least need to create an environment that would enable teachers to do things for themselves using P.E.N.C.I.L. Technology. Government could perhaps contribute further by lifting VAT on this type of equipment for teachers' home use. For the equipment that was initially only available in schools, LEAs could provide insurance cover to enable teachers to take them home and practice their use in a non-threatening environment. Obviously schools would need to record the serial numbers in the school inventory and security mark them in prominent places.

Whatever happens we must not lose sight of the fact that the value of Technology in education is that it makes the curriculum accessible to many more children. Each step forward is made as a result of previous ones. The fact that some steps become more firmly embedded than others is irrelevant. What we must try to ensure however is that in our endeavours to move forward we don't throw out the lead with the shavings.

MAPE Problem Solving Programs

MICRO-SCOPE 27 included details of how to send for a disc containing two problem-solving programs (*Knights Challenge* and *Topol*). The classroom materials for *Knights Challenge* were included in the centre pages of *MICRO-SCOPE 27*, with the promise that the classroom materials for *Topol* would be included in the next *MICRO-SCOPE* (see green centre pages).

If you have not already acquired the disc you can do so by sending a blank formatted disc (only BBC 40T or Nimbus PC please) and a self-addressed adhesive label, plus 35p in stamps, to the MAPE Information Officer (KG), Computer Centre, Newman College, Bartley Green, Birmingham B32 3NT.

The materials are copyright of MAPE, but may be freely copied for educational purposes. We are grateful to Pete Young and Roger Keeling for preparing the resources, to Les Watson for 'pagemaking' the results, and to Geoff Turrell for the illustration.

TOPOL

Teacher's Page

How to use the Program

After loading the program you are shown a choice page:

A: Choose a random game
B. Choose a preset game
C: Set a new problem
D: See the notes
E: Stop

Pressing Q (or escape) at any stage will return you to the initial menu.

Playing the game

There is a choice between playing a random game, in which the letter bricks are scattered randomly over the grid, or playing preset problems. The latter have been carefully graded to lead the pupils through a series of techniques and experiences which will enable them to tackle the more ambitious randomly generated problems. The preset problems should be attempted in numerical order. The same problems are shown on the worksheet in order to help the pupils keep a record of the path they have traced out. The black grid square is the starting position. Move the square by means of the arrow keys. Notice that it leaves a trail behind which may not be retraced or crossed. The letter bricks can only be dealt with in alphabetical order. When all the letter bricks have been linked, the game ends and there is the choice of repeating exactly the same game, scrambling the positions of the letters on the grid and playing again, or of returning to the main menu.

The preset problems are different from those in the version of the program that appeared on MAPE Tape 4. This version also contains a delete facility (i.e. the delete key) which will enable the player to erase the path just drawn.

In the case of the randomly generated problems you will also be asked how many letters you wish to use; the number chosen will be the number of bricks displayed on the grid (maximum 26).

Set a new problem

Trailers are first asked to choose the number of letters that they want to use in the problem (maximum 26). Use the arrow keys to guide your position square around the grid. Press RETURN to indicate the starting position of your problem. Continue moving with the arrow keys and press RETURN every time you want a letter positioned. It will be labelled automatically. The game will start after the last letter has been placed.
Note: Although the game can be replayed, it cannot be saved to disc.

Scoring facility

Players are 'paid' a 'wage' based on the number of letter bricks which have been successfully linked. The basic wage is 50p. One penny is deducted for every brick used and a bonus is added for every letter linked up, 10p for the first letter, 20p for the second, 30p for the third etc.

Topol
Pupil's Page 1

Topol, the troublesome trogg, has been building walls of invisible bricks all over Topazia. Unfortunately these walls are cluttering up the countryside and everyone keeps bumping in to them. Things are so bad that the cottage hospital is running out of bandages and plasters. The council has employed a Trogg Trailer to search for the walls but he too has been injured bumping against the invisible bricks. Your task, apprentice Trogg Trailer, is to discover where these invisible walls are and to draw them on charts so that the council can remove them before anyone else gets hurt.

You have several clues to help you find where the invisible walls are.
They all start at the black brick and link up letter bricks in alphabetical order.
Topol always uses as few bricks as possible.
His walls never cross each other or double back on themselves.

To help you in your task the last Trogg Trailer has made eight problem walls for you to practise on. These start with very easy walls but they soon become more difficult. Topol doesn't like his walls being discovered and has started making them more and more complicated. You will need all your wits about you, my friend, if you are to succeed. Good luck in your task!

Trogg Trailer Training Sheet

How to choose a problem to practise on

1. Select 'Choose a preset game' by pressing A (RETURN)
2. Now type in the number of the problem you want (RETURN)
   Start with problem number 1 which is the easiest to solve.

This is how you should begin

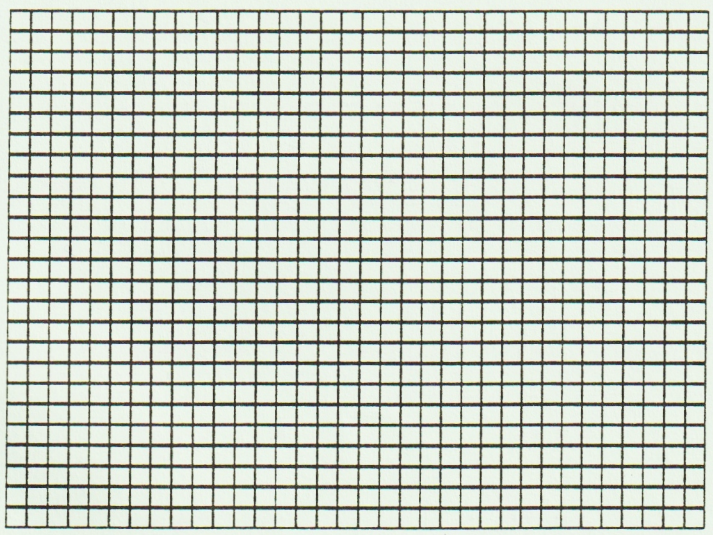
Look at the position of the letter bricks on the chart.
Start at the black brick and use the arrow keys to chart a route which will pass through all of the letter bricks in alphabetical order.
You will not be allowed to cross over your path or to retrace it. You are allowed to delete your path if you find you have gone wrong.

Wages

The council will give you 50 pence to begin your task and they will pay you a fee for each letter brick you can link to. Bricks are expensive however so they will charge you 1p for each one you use.

Charting the walls

The Trogg Trailer has marked out the position of all the letter bricks on charts like the one shown below.



Draw out your path on the grid and check your pay against the amount which you could have earned. If you didn't earn this amount look again and try to see if you can find a better route. Try this new route and check your pay again. If you can match the target wage you will have done very well and should move on to more complicated problems.

Playing for Real
Now that you have successfully completed your apprenticeship, you are ready to become a fully qualified Trogg Trailer!

This is how to begin
1. Choose the option to play the random game.
2. Type in the number of letter bricks you want to try to link up.

Start with seven or eight, but you can increase the number if you find the task too easy (up to a maximum of 26 letter bricks).

Topol's Trails for Two Players
You can plot Topol's Trails with two players!
One player must be Topol the troublesome Trogg and the other player is the Trogg Trailer. Topol begins the game by building an invisible wall in secret for the Trogg Trailer to find.

How to Build the Invisible Wall
1. Choose 'Set a new problem' by pressing C (RETURN).
2. Now type in the number of letter bricks you want to use, between five and ten should be enough to start with.
3. Use the arrow keys to move the black starter brick to where you want the invisible wall to begin. Now press (RETURN).
4. Keep using the arrow keys to build your wall. Press the (RETURN) key when you want to place a letter. Make sure the Trogg Trailer isn't watching as you do this!
5. As soon as you place your last letter brick the computer will hide your trail and only the letter bricks will be shown on the screen.
6. Now your finished wall is ready for the Trogg Trailer to find.

Targets for the practice problems

1.	**£1.53**	**5.**	**£1.04**
2.	**£1.18**	**6.**	**£1.31**
3.	**£0.94**	**7.**	**£1.42**
4.	**£0.96**	**8.**	**£2.04**

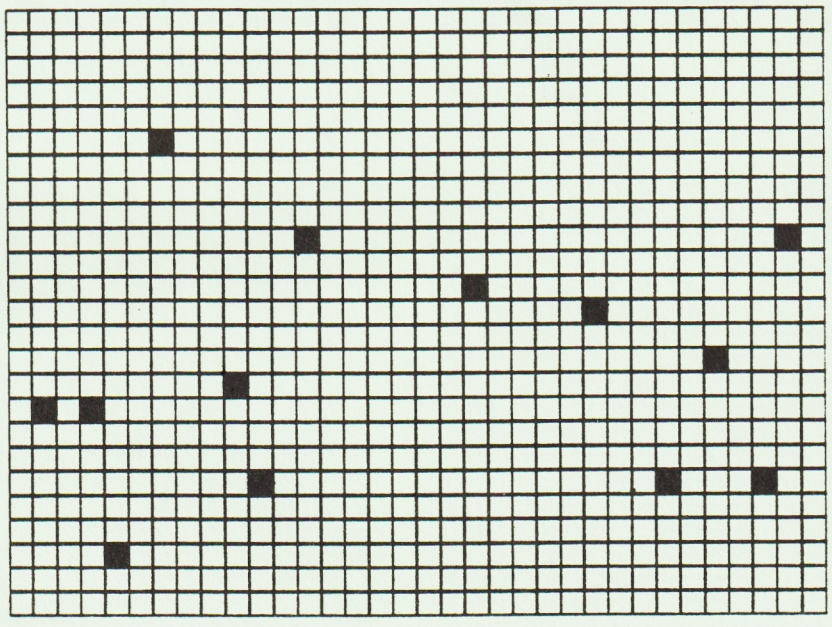
Competition!

Topol's Tricky Trail

Topol has laid a fiendishly tricky trail of his invisible bricks across Topazia. Only advanced Trogg Trailers will be able to solve this troublesome problem. The Council have put up a reward for anyone who can uncover it.

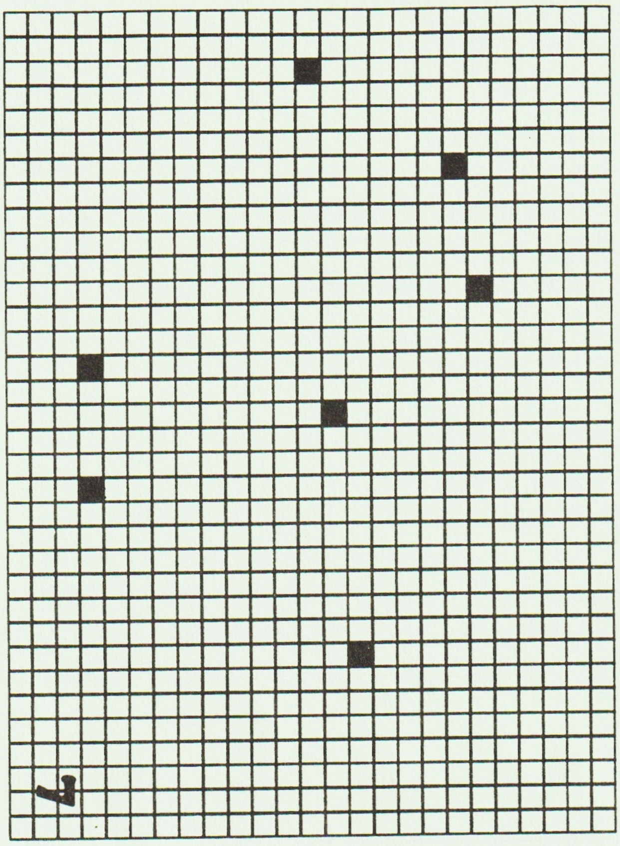
What You Have To Do

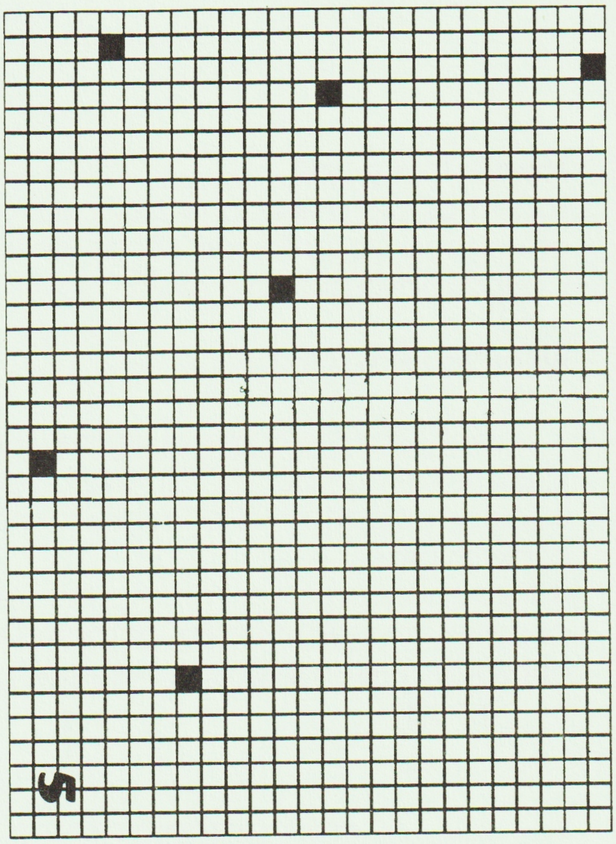
1. Select 'Choose a preset game' by pressing B (RETURN).
2. Enter the number 9 (RETURN) to see the Tricky Trail!
3. Study the pattern of letter bricks and work out a route which will link up all the bricks in order.
4. If you can match or improve the Top Wage shown in the score box, you can consider yourself to be a Champion Trogg Trailer! To claim your reward, draw out your route on the grid below and post it to the address shown at the bottom of this page.



Topol's Tricky Trail,
c/o Roger Keeling,
Newman College,
Genners Lane,
Bartley Green,
Birmingham B32 3NT

If you can exceed a wage of £5.50 why not send in an entry? Make sure that you include your name and school address; mark in your route on the grid and state the maximum score that you achieve.



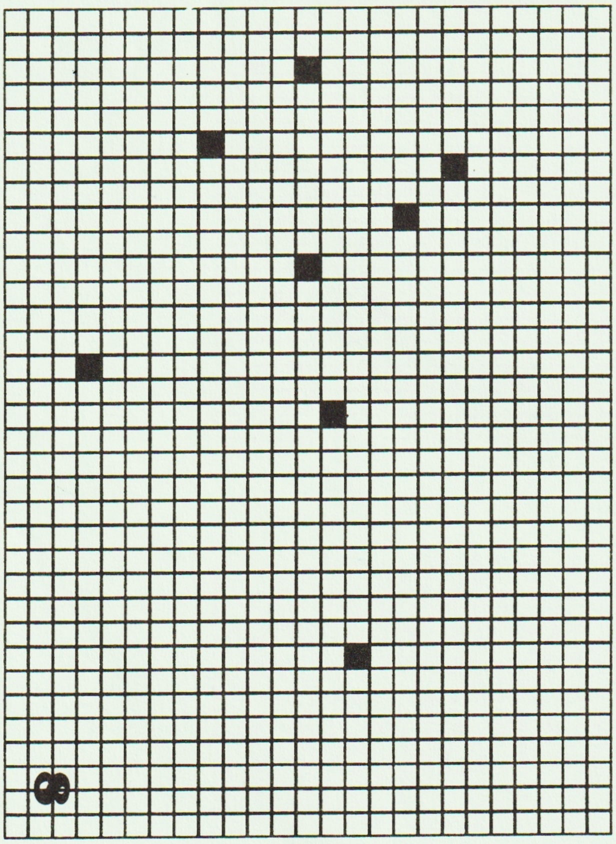


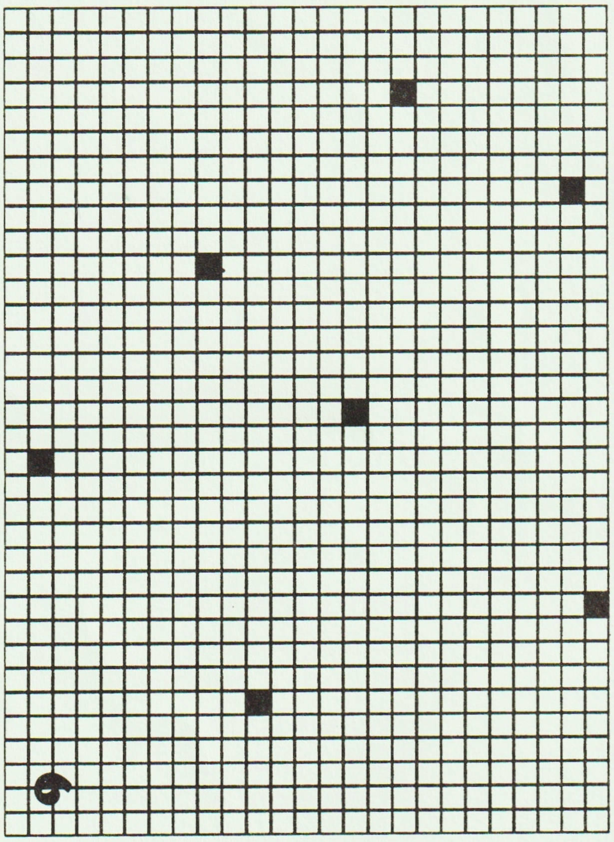
Your pay

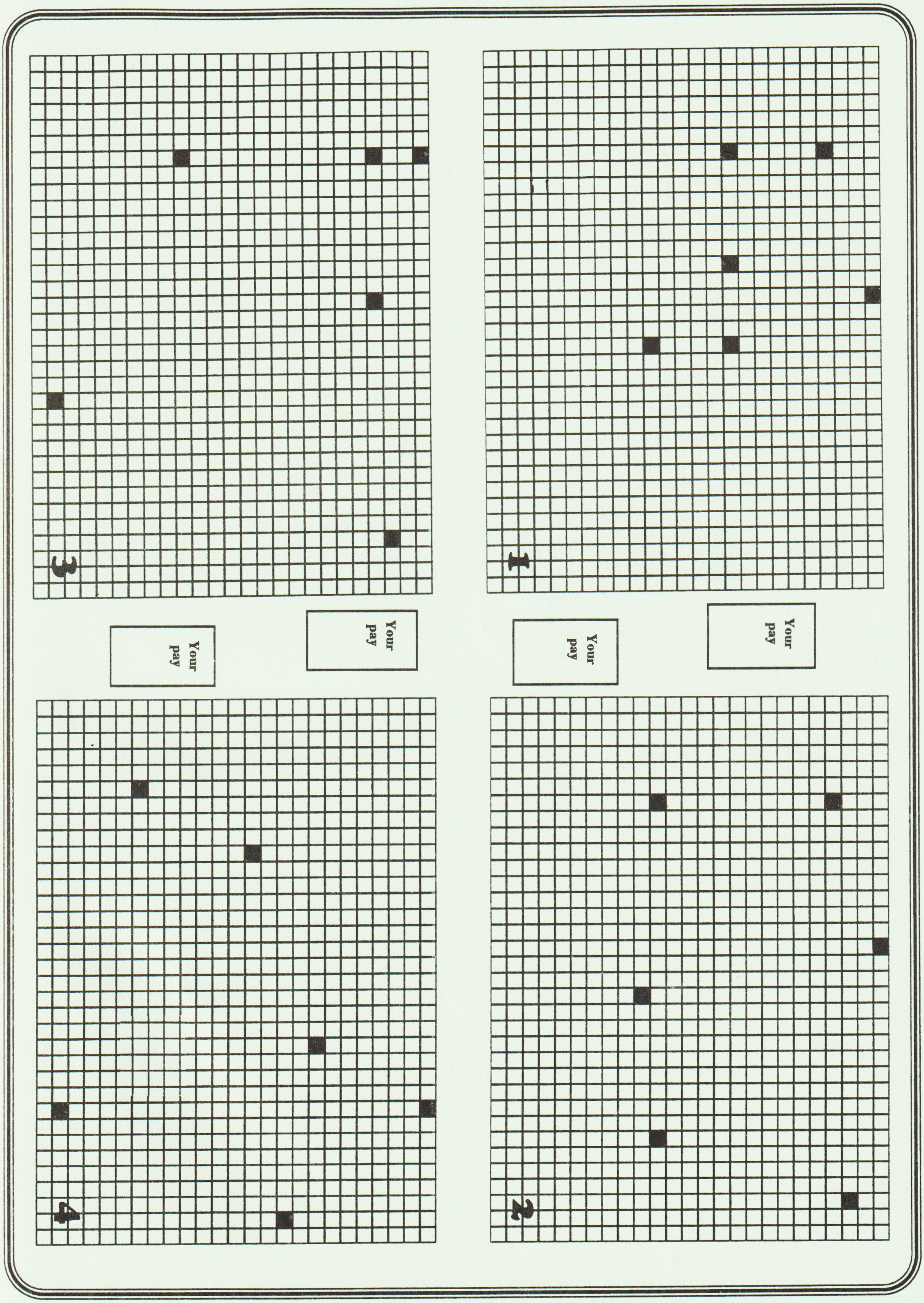
Your pay

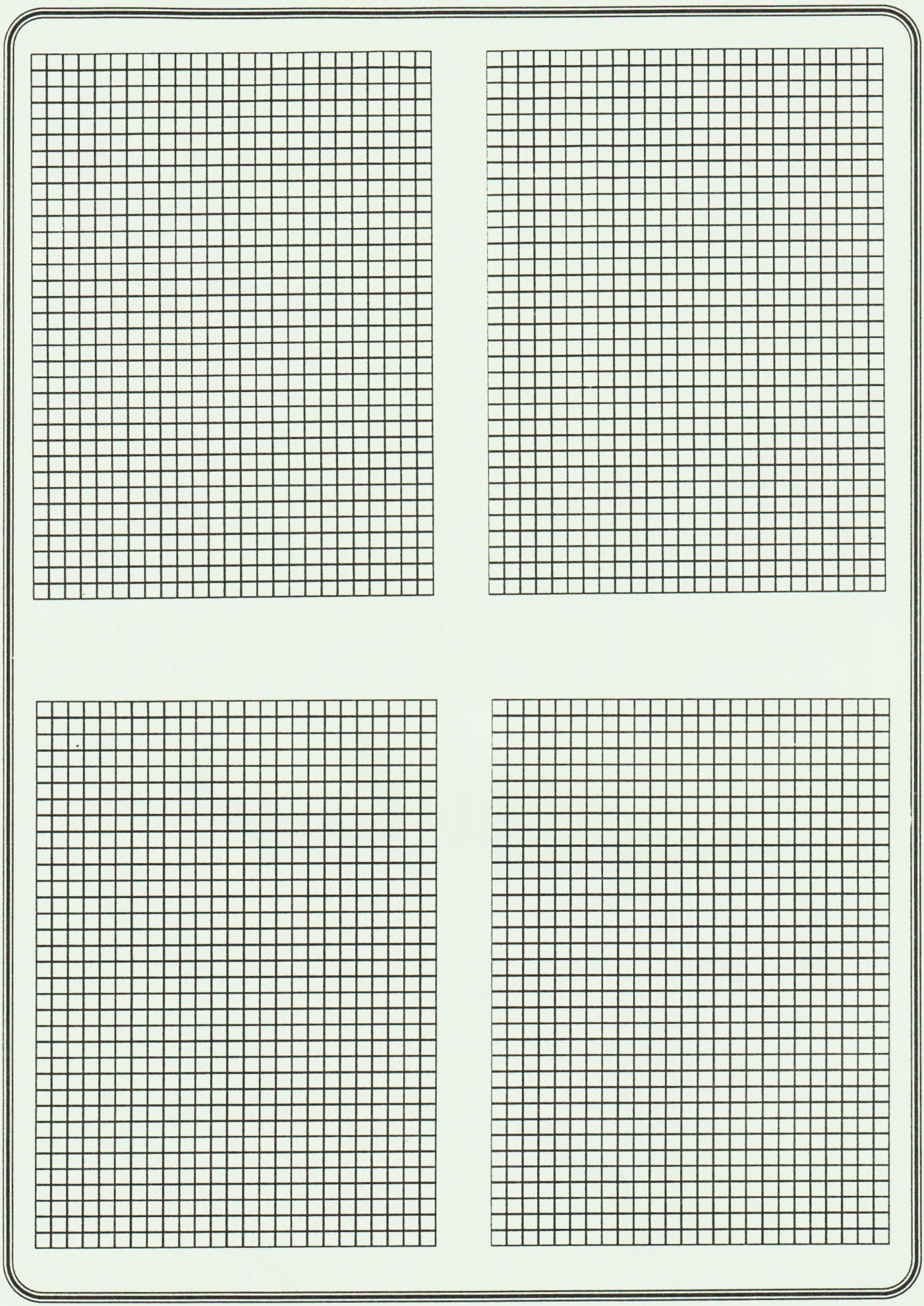
Your pay

Your pay






1
2
3
4
Your pay
Your pay
Your pay
Your pay



'Portability, that's the beauty of CAS . . .'

CAS: Computers available for schoolchildren

David Dodds
Senior Primary Adviser, Shropshire LEA

A case for the introduction of the affordable, portable, micro into the classroom

The National Curriculum requires that all children are given adequate access to computers to enable them to wordprocess and dataprocess. The new HMI document *Technology 5–16* adds Music and Art to the prescription. The Design and Technology Interim document makes the point that all subsequent Foundation documentation should make reference to uses of IT. There is only one drawback to these ambitious plans. . . . We have not got the computers!

There are perhaps *four* identifiable stumbling blocks to the successful spread and integration of the computer into the classroom context.

1. affordability
2. accessability
3. compatability
4. applicability

1. Affordability

Most schools in the primary phase of education have little purchasing power. Capitation has to resource the entire curriculum, including expendables, and averages £18 per child per year. There is little left at the margin to purchase expensive hardware. Schools therefore have to resort to community fund-raising to provide the technology *and many other items*. One can only go to the community every so often.

Most manufacturers seem unaware of this dilemma, and the current statements being issued by them indicate a purchase price of between £800 and £1000 per computer unit, once we have added the printer to the price; for a work station *must* consist of a computer, disc drive, monitor, *and printer*. Prices quoted invariably preclude the printer, and a computer without a printer is less than worthless because it forces the teacher into providing brain rotting trivial pursuits rather than the genuine applications that HMI and the National Curriculum are demanding.

The *colour* monitor is another item of expenditure that should be looked at seriously. Why *colour*?, one must ask. There is a case for suggesting that the first machine into a school should be equipped with colour, and perhaps those machines that will be dedicated to the early years, but in the main a monochrome monitor will cater for all the software requirements of the primary school: wordprocessing, data-processing, and control plus a logo-like environment do not require colour. The saving accrued by a non-colour dependency is considerable. Over time, over additional machines, it soon amounts to the wherewithal to purchase additional *computers*, and surely this is what the ultimate aim is: 'one per desk', to quote one manufacturer's clever slogan.

Thus there must be a different pricing policy if computers are to be seen to be within the reach of all classrooms and all children.

One partial answer is DES support, which does allow machines to be funded and subsidised into the classroom. However the DES is currently very prescriptive in the machines it supports. This coupled to policy making which varies from year to year, and some very last-minute fund releases make it difficult if not impossible for schools to develop sensible long-term computer acquisition policies. However, schools are trying to increase the number of keyboards available to children. This does not involve the purchase of one expensive esoteric machine but the purchase of *many* affordable keyboards. With twenty-five thousand primary schools in the UK alone that could mean a lot of business. If we then add the demand that would arise from the middle school, secondary and tertiary sectors there is an enormous market potential for a machine that is priced correctly. This is without going into the potential of the home-computer market, where home–school links must be only a matter of time when it comes to IT. The electronic equivalent of the pencil-box cannot be far away, for homework and home-based activities.

2. Accessibility

The computer is a tool rather than a curriculum area or a study in itself, and therefore it should be available to the child, or a group of children, when required. Many schools still ghetto the

hardware in specific departments thereby denying access to the equipment for the child except when they are timetabled to have 'hands-on'. This results in inappropriate activities taking place – as activity is not associated with need.

In many schools the number of keyboards means that the computer is an extremely scarce resource. The children therefore have to wait for the computer to reach their classroom over considerable periods of time. The computer might be available once per term, or even less frequently. Those schools that have developed a 'time-share' approach to the distribution of the computer(s) often create a counter-productive situation of the child having too short a time at the keyboard for real educational advantage. This results in such educational trivia as skills-and-drills or so called 'educational games'. Alternatively, how can a young child wordprocess for a ten minute 'burst'? Can we expect a youngster to switch suddenly onto 'wordprocessing writing mode' when sitting at a keyboard. In reality what happens is that the child will have written out and corrected the work as a pencil and paper activity before keying it into the machine to print out the 'best copy'. This isn't wordprocessing; it's Jumbo typewriting – but there is a lot of it about!

3. Compatibility

This is often the scourge of the secondary school. Different departments in a school will purchase the computer that most suits their particular need – graphics, music, business studies, audio-visual capability – each machine has a particular strength and will be purchased accordingly. The result is a series of departments that cannot communicate with each other through IT. The very tool that could have united different curriculum areas in cross-curricular activities is negated through a lack of communication ability.

At the primary phase level schools and LEAs become trapped in a 'one-make' purchasing policy that makes the organisation dependent upon the whims and vagaries of that particular manufacturer. Thus the manufacturer becomes in reality a monopolistic enterprise. One computer manufacturer is currently considering replacing a model that is to be found in hundreds of classrooms with a new machine which will not run the software that has been built up over the past years and has become the bedrock of computing development within many LEAs! This isn't 'continuity and progress'; it's change, and change that is neither welcome nor unavoidable.

4. Applicability

In the business applications sector of the market the concept of 'bundled' software has been developed for a considerable period of time. Purchase a computer and the appropriate software for its application is provided as part of the deal. The small business will purchase a micro complete with wordprocessor, database, and graphics package to enable instant applicability to the task in hand once the machine has been unpacked. Not so the educational computer! Inappropriate software of dubious quality has been provided on cassette in the past. Some on-board firm-ware is now provided on some machines – but the programs that are resident have not been designed with the young child in mind; and those that do cater for the young child are educational cul-de-sacs. *ABC*, the introductory wordprocessor on the BBC is an example of this. Where does the child who has outgrown *ABC* go to? There is nothing that this program relates to directly. Having learned, the children must relearn, and this does not make a policy for putting wordprocessing *through* a school in terms of continuity and development an achievable task!

Affordability, Accessibility, Compatibility, Applicability. . . . We are now close to a solution with the arrival of the portable lap-top computer.

The closest match to these criteria is the Z88 by Cambridge Computers, which we have been desk-testing in many Shropshire schools.

1. Affordability

The educational price of this machine outdistances it from all competitors. The drawback is that memory has to be purchased as an optional extra. The primary child does not require mega-K of memory, but an on-board facility of 48K (usable) would cover all primary eventualities. Additional ROM could be purchased as plug-in for secondary and tertiary education applications, and the current range of add-on memory cartridges would certainly suffice.

Affordability would mean the possibility of access to a keyboard for many school children, which is the intent of the National Curriculum, and the dream of all schools. To turn the current nightmare into a dream into reality, over time, would be no mean feat!

2. Accessibility

Here the portable is outstanding; and of course we must differentiate between the truly 'portable' and the 'luggable'. For school work and field work the portable is the solution. Through 'portability' the keyboard is a genuine tool in the classroom. The child, or group, can take the computer to the task instead of queuing for a place at the 'work station' (surely a word coined to legitamise a totally unsatisfactory situation). Also through portability data-capture data-input and on-site note-taking become a reality. The portable machine can control robots more easily by being embedded within the artefact, machine or model when required.

3. Compatibility

The genuinely portable machine is portable not only in itself but in its ability to communicate with different machines. 'Connectivity' is the current 'buzz' word, and a machine that can provide a source of additional keyboards that will 'connect' with the indigenous machines of the school will be a welcome additional resource. The fact that remote work can be spooled and aggregated into a Desk Top Publication, a cross-curricular mathematical study, or a class or school theme will be good news indeed to those schools that are seeking to give 'hands-on' experience to all pupils rather than a select few.

More good news! The machine that can down-load to various machines can also up-load from them. The portable can provide the bucket for carrying work between machines and between departments. Work undertaken on the Beeb can be spooled into the portable and carried to the PC, the Mac, or the Atari – thus departmental work is no longer an isolated activity. The National Curriculum's statements about 'Communication' can now be a source for inter-departmental collaboration. The integrated nature of real learning becomes a reality. Further the strengths of the various machines in the mixed economy can now be capitalised upon – the Mac can be used for the high quality DTP whilst the ubiquitous workhorse – the BBC – provides the raw text, supported by the portable which provides both the means of transferring and carrying but also the much needed additional keyboards.

That is at the secondary and tertiary stages of education; it should also be noted that the portable machine in the primary school can also 'bucket' work from the feeder primary school to the receiving secondary school to allow for the continuity of work that will become central to work within the National Curriculum. Small rural primary schools that are increasingly urged to 'cluster' together to support the National Curriculum will also welcome a machine that will facilitate the transfer of text and data between schools for collaborative work can in consequence be undertaken.

4. Applicability

The notion of 'portability' is enhanced with on-board software. The moot point is: what constitutes appropriate educational software?

The National Curriculum requirements and the recent HMI document 'Technology 5 to 16' points up the software requirements for classroom applications: wordprocessing, dataprocessing, control and art applications. The latter are art, design and electronic music. This makes four application areas, but this does not mean that schools should be expected to purchase or 'acquire'(!) libraries full of programs to run on the machines. One manufacturer currently boasts that over 4000 programs are available for their product. Basically all that is required is a 'bundle' of word and data processing and a control package. In the portable this can be the resident software. The few additions could be provided through cartridge insertion.

The software itself should be 'upwardly expandable', in that the program should allow for a simple entry point for the young child or novice, and yet should have the facility of switching into more sophisticated support for the more advanced applications. *Folio* almost covers these criteria, were *Folio* a genuine wordprocessor. *DIY Database* is such a program within the dataprocessing range.

Thus the case for the introduction of an affordable, truly portable, dedicated educational computer is incontrovertible.

The history of human communication through the written word has shown a move towards the portable and the accessible. Gone are the clay tablet, the quill and soot concoction and the secretaire. The notepad and rollerball give us immediate access to written communication whenever and wherever we require it. It must surely be only a matter of time before computer literacy reaches the same dimension. The question is: how long can a child in a queue of one hundred or sixty children (to quote the Design and Technology Interim Report) afford to wait?

'No, John, it's not your turn for the *HB pencil* until next Thursday week, so you must wait!" . . .

Chaos!

Reg Eyre
College of St Paul & St Mary, Cheltenham

A recent Channel 4 TV programme aimed to explain the phenomenon of 'Chaos'.

It was described as pattern seeking for orderliness within apparently random complex physical situations. One example which was given was the butterfly effect on weather systems, where the flapping of a butterfly's wings can cause a minute effect on the initial starting conditions for the complex mathematical model that the meteorologist has devised for predicting the weather. This small effect on the starting conditions can get magnified so much, that the predicted weather across the Atlantic could range from mild to storms.

This work has also been closely aligned with the work on Mandelbrot sets. D.E. Reeve has written a nice description of regular, as opposed to random, deterministic fractals. The article comes with computer code and print-outs – 'Some Relations of the Mandlebrot and Julia Sets: a computational Exploration' in *The Bulletin of the I.M.A.* Vol. 25, Nos. 7/8, July 1989.

Apart from these two aspects, the programme fleetingly showed examples of random behaviour which produced regular patterns. It was obvious to me that Logo was the natural computer language to use to try this work for myself.

The problem can be stated as follows:

Imagine three fixed positions. Start from a position anywhere inside the three original positions. Now face, at random, one of the three original positions, and move half-way towards it. Mark this new position. Now choose, at random, one of the three original positions to face. Move half-way towards it, mark, and continue this process indefinitely.

The code is fairly simple:

```
TO GO
HT
SETPOS [0 0]
MAKE "N 1
BROT
END
```

```
TO BROT
MAKE "N :N + 1
IF :N > 3000 [RECYCLE]
MAKE "R RANDOM 3
IF :R = 1 [PU SETPOS SE XCOR / 2 ( YCOR +
  300 ) / 2 PD FD .1 BK .1 ]
IF :R = 2 [PU SETPOS SE ( XCOR – 346.4 )
  / 2 ( YCOR – 300 ) / 2 PD FD .1 BK .1 ]
IF :R = 0 [PU SETPOS SE (XCOR – 346.4) / 2
  (YCOR – 300) / 2 PD FD .1 BK .1 ]
BROT
END
```

Here are some outputs (Figures 1–4):

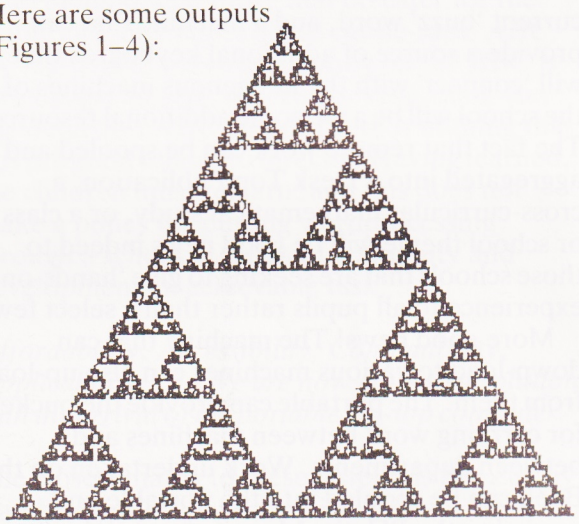


Figure 1

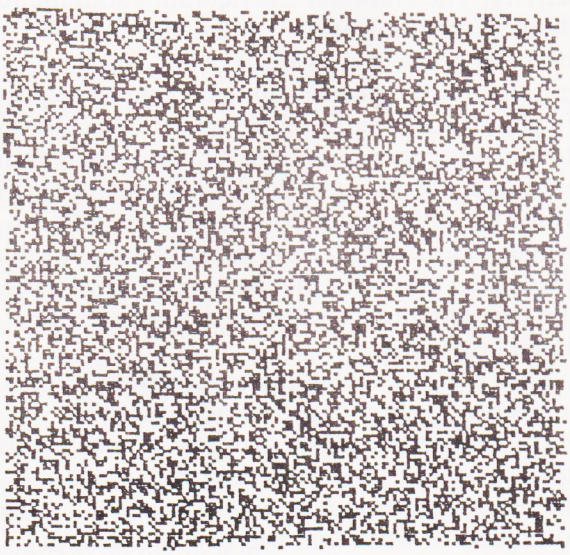


Figure 2

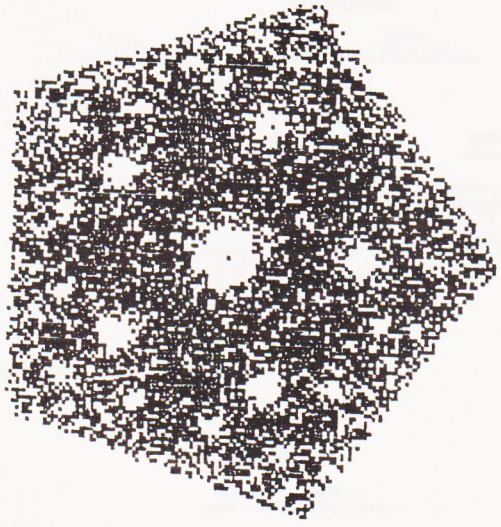


Figure 3

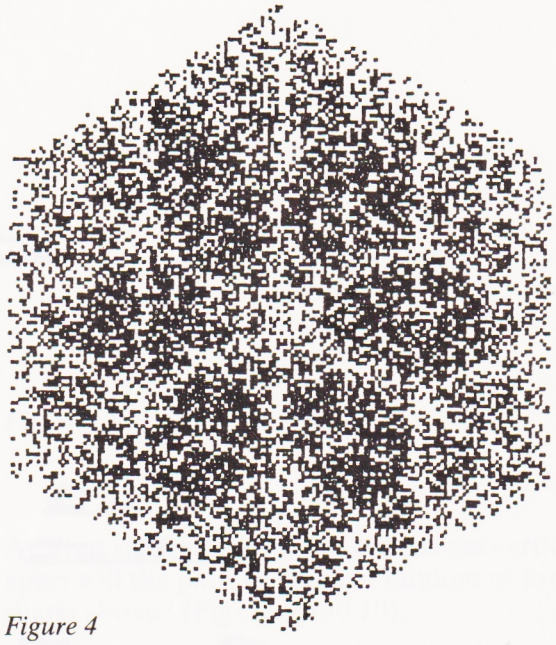


Figure 4

Some typical questions for extending this work could be:

What happens to other vertex positions for triangles?

What happens for non-regular shapes?

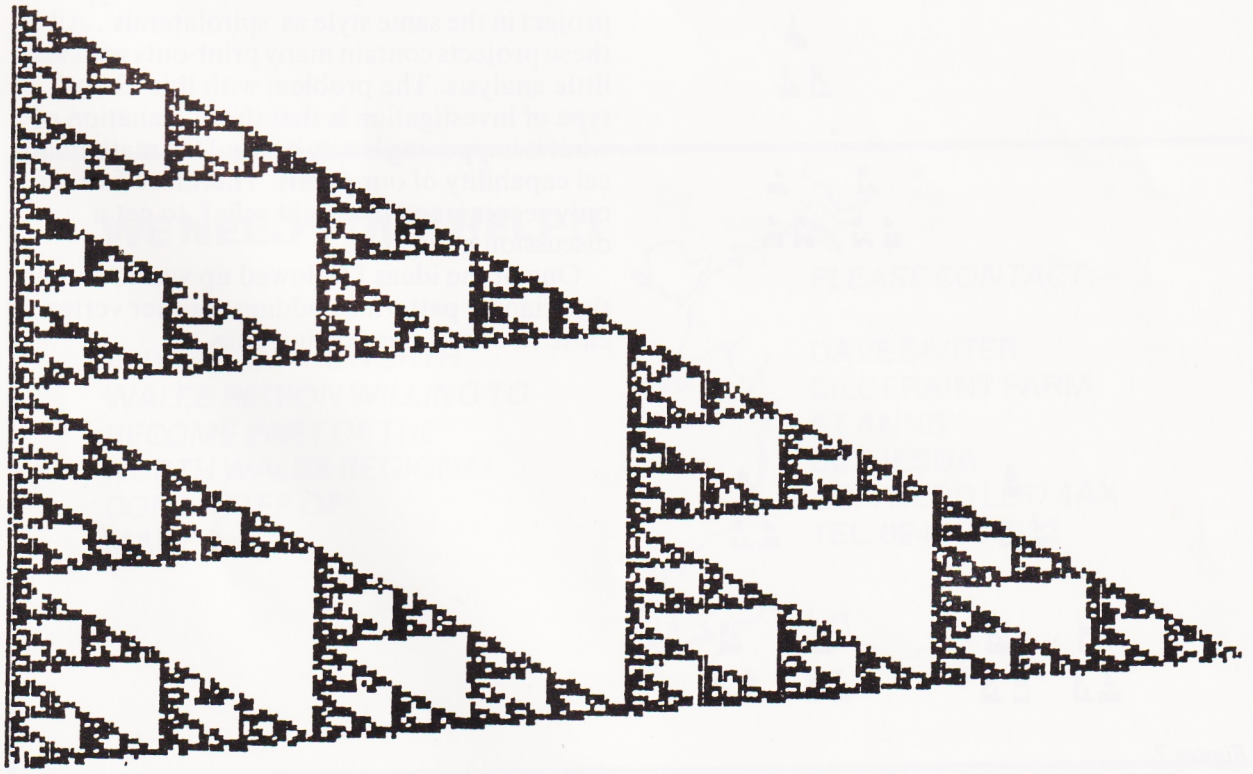


Figure 5

What happens for other regular polygons?

What happens if a ratio, other than 0.5, is chosen for placing the marked point?

Figure 6

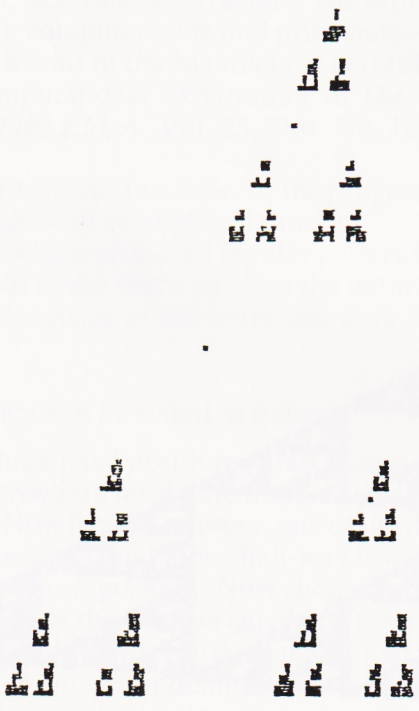


Figure 7

I began to worry that what we might end up with is another computer mathematics type project in the same style as 'spirolaterals'. All of these projects contain many print-outs with very little analysis. The problem with this 'chaos' type of investigation is that the explanation of what is happening is way beyond the mathematical capability of our pupils. Therefore I would only recommend it as light relief, to get a discussion going, etc.

One of the ideas I followed up was to extend the triangle pattern by adding another vertex close to one of the existing ones.

Figure 8

Figure 9

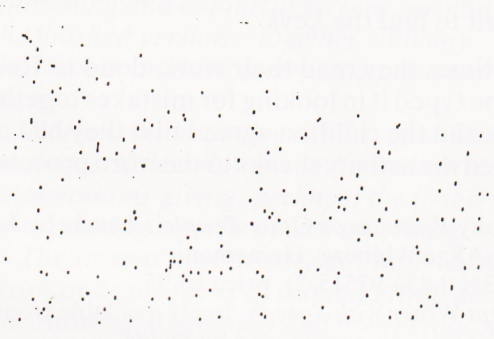


Figure 10

At what stage of moving the two close vertices apart will the pattern become random as for the shape above? (Figs 8, 9 and 10).

N.B. The programme I watched was a repeat and some of the suggestions above have been suggested by Derek Ball in the latest edition of *MicroMath*.

First Class Post

Sue Marlow
Cheltenham

As an Advisory Teacher I am in the very privileged position of being able to see many creative ideas which are happening in classrooms.

One such idea was the making of books about *The Jolly Postman* compiled by J1/J2 children at St. Briavel's Parochial Primary School.

Ros Andrews told the class the story. The postman delivers letters to different characters on his route. The letters in envelopes are included in the book and are 'handwritten'.

- Goldilocks apologises to Mr and Mrs Bear for sleeping in Baby Bear's bed and eating his porridge and invites them to a party.
- A witch receives a leaflet about spells and potions which she can buy.
- Jack (of 'Jack and the Beanstalk' fame) sends a postcard to the Giant saying how much he is enjoying his holiday!

The children were excited by the prospect of writing their own books and creating their own characters. These ranged from sending a cosmetic leaflet to Madonna, an urgent letter to Dr. Foster to ask him to come to the palace as Humpty Dumpty had fallen off the wall, to an invitation to Miss Piggy from Kermit inviting her to tea.

Ros chose this idea because of the availability of *Concept Writer with Speech* and a printer so the children's work would look like a real book.

She asked the children to plan out the book, the characters and the type of letters so they knew where they were going next! Some children showed me books written in their own way. Ros suggested they could write out the story a little at a time in rough before using the word processor. Their work was printed out twice, just in case! The second sheet was then used for 'cloze' procedure, the children putting together the story but cutting out words for their friends to insert later. The next stage was to write to the authors to tell them what the school had done with the program. (See the reply they received below.)

By watching the children Ros felt the activity had given a great deal of pleasure – all were given an opportunity to work at their own level. Great delight was experienced by children reading each others' books.

What did the children think?

'No more messy writing!'
'No more hand-ache!' – although it was difficult to find the keys.

Sometimes they read their work aloud to Ros and she typed it in looking for mistakes together.

Ros and the children agreed that they had all enjoyed the activity thanks to the word processor.

The Jolly Postman or Other People's Letters by Janet and Allan Ahlberg, Heinemann (ISBN 0-434-92515-2), price £6.95.
Concept Writer with Speech, freely available from Advisers, now superseded by *Stylus*.

8th December, 1987

Mrs. R. Andrews,
St. Briarels Primary School,
High Street,
St. Briarels,
Lydney,
Glos.
GL15 6TP.

Dear Boys and Girls and Mrs. Andrews,

Thank you all very much for your letters - Janet and I have enjoyed reading them - and we think the pictures and coloured borders are brilliant! We are pleased to hear that you have enjoyed The Jolly Postman, and are writing Jolly Postman letters of your own. It may interest you to know that we got the idea for this book from our daughter, Jessica, when she was 2. She loved to play with the pot when the postman brought it each morning. She loved putting the letters in and out of their envelopes. So we thought it would be a good idea to make a book with letters in it. But it took a long time - and when the book was finally published, Jessica was 7!

Many of you have asked for my autograph - so here it is. I made a few copies using my copying machine.

Well, thanks again for writing and best wishes.

Yours sincerely,

Allan Ahlberg

P.S. Here is a copy of The Vanishment of Thomas Tull, which Janet and I hope you will also like. We hope you haven't heard it or read it yet.

An evaluation of *Caption*

Chris Hopkins
Computer Support Teacher for Special Needs, Berkshire

'Caption is a new framework program which allows activities to be constructed for all ages and abilities right across the curriculum. It was particularly designed to motivate reluctant writers and to support language work done by students with motor and learning difficulties. It invites users to write in text windows on interesting and colourful screens, printing out the finished version – together with any illustration on the screen – as a permanent copy.

Work looks attractive at all stages. The editing facilities allow for unlimited corrections or alterations giving, perhaps, the first chance of producing a perfect piece of writing.

The screens may be used for individual work or as the focus of a small group activity encouraging discussion and co-operation, drawing together a variety of skills and ideas.'

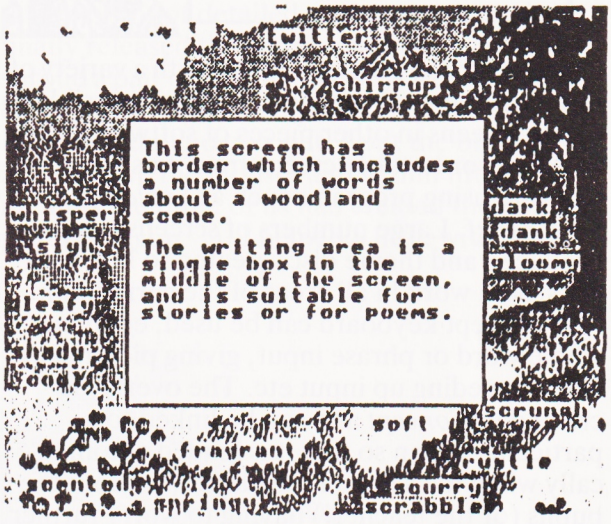
(taken from the Caption *documentation)*

The program comes with a wide variety of screens ready for classroom use and the facility to design new pages related to specific activities, helping to reinforce and enhance the work taking place in the classroom. Some of the examples are screens created for specific purposes and help to illustrate the many ways in which the program can be used, and the different forms of writing they can stimulate and encourage. There is also a section in the documentation giving suggestions for classroom use.

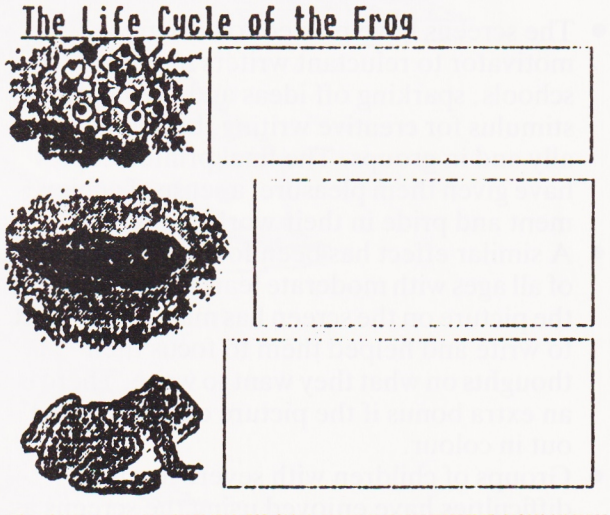
The program is simple to use. There is an option to see the screens so they can be looked at before a decision is taken about which one to choose. When a screen is chosen, it is displayed and the pupils can write what they want into the text windows that are set up on the screen. The program has the functions of a simple word-processor, so the writing can be edited if required. Also, the colour of the writing can be changed to any of the four colours on the screen.

If the writing has to be left half way through, it is possible to save the work so that it can be reloaded subsequently, so that pupils can carry on writing. There are, unfortunately, a few pitfalls to avoid when doing this; for example, the reloaded portion of the writing cannot be edited, and changing the colour of the reloaded text will result in the complete loss of text! It is wise therefore, to correct mistakes and decide on the colour of the writing before it is saved.

A screen can contain either one large writing area or a number of smaller ones, depending on the type of screen being used. A screen which gives an attractive border will have one large area in the centre:



whereas an information gathering sheet will have many:



The program can support different styles of writing and different areas of the curriculum. For example, forms can be simulated to give pupils practice at filling them in, with on-screen help given if necessary.

Although the program comes with a variety of sample screens on the discs, it is also possible to create screens in other pieces of software, such as *Image*, or to take screens from existing software using programs such as *Snatch* or *Screenthief*. Large numbers of screens can be produced and theme discs created to link with classroom work in all areas of the curriculum.

A concept keyboard can be used, enabling whole word or phrase input, giving pictorial clues, speeding up input etc. The overlay is created in *Concept* and can be linked to a particular screen so that it is loaded automatically when the screen is displayed, without the pupils (or the teacher!) having to worry further about it.

The program has been trialled in a number of schools in Berkshire and has been used to great effect in many different situations:

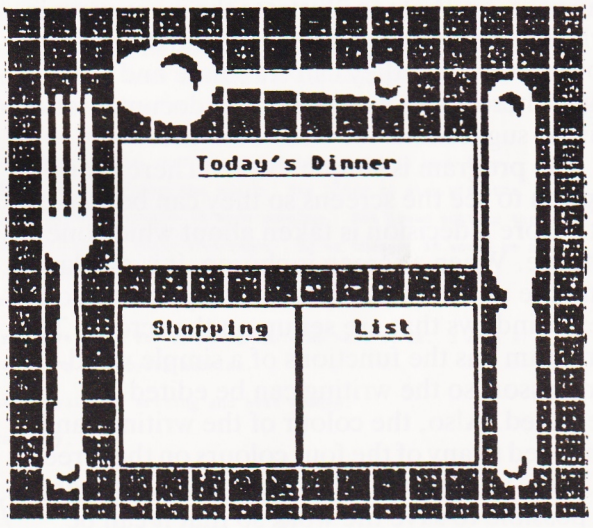
- The screens have proved to be a great motivator to reluctant writers in secondary schools, sparking off ideas and providing the stimulus for creative writing, both individually and in groups. The final printed copies have given them pleasure, a sense of achievement and pride in their work.
- A similar effect has been found with children of all ages with moderate learning difficulties; the picture on the screen has made them want to write and helped them to focus their thoughts on what they want to write. There is an extra bonus if the picture can be printed out in colour.
- Groups of children with severe learning difficulties have enjoyed using the screens as part of a conversation and story telling session, the teacher recording on the picture what the children have said.
- Children whose second language is English have used specially created *Podd* screens linked to overlays as follow-up work, having previously used the program *Podd*.
- Language and Literacy Units have found *Caption* screens very rewarding, stimulating in children the desire to write both on screen and on paper.
- Last, but by no means least, it has impressed the teachers who have been introduced to the program, even those who had previously shown a marked reluctance to use a computer in their classrooms!

For all ages and abilities, *Caption* screens seem to produce the desire to write.

- to motivate reluctant writers
- to support work done by students with special needs
- to encourage positive group interaction and interdependence
- to foster a critical appreciation of the presentation of written information
- to promote a positive image of students with special needs and their written work

These aims have certainly been realised during the trialling of the software in Berkshire schools.

Caption is published by NCET and is distributed by Hoddle, Doyle, Meadows Ltd., Old Mead Road, Elsenham, Bishops Stortford, Herts.
Tel 0279 813939.



A report on the use of a Commodore AMIGA with *Deluxe Paint II*

Graham Keeling
Earlesfield C.P. School

Commodore delivered the AMIGA at the end of April. We had 30 minutes' instruction on the use of the Art package *Deluxe Paint II* and then we were on our own.

The children were thrilled – at last a real computer! Everyone except teachers knows that *real* computers are called Amstrad, Atari or Commodore. The children knew more about it than I did – some of them had had hands-on experience of this actual machine before. I couldn't even get the cling-film off the handbook!

The lady from Commodore had created a mini masterpiece in about three minutes flat, but I knew that it was just a bit of show for the punters. After two years of wrestling with art packages for the BBC series of 8-bit computers I knew art packages to be complex creatures that take months of detailed study to master. As I finally released the handbook from its plastic shroud a pair of fourth-year boys were using the curve line to draw a dolphin. The line along the back wouldn't go on right. I put the book down and took up the mouse, and within fifteen minutes the three of us had created the dolphin picture (Figure 1). I helped a little with the

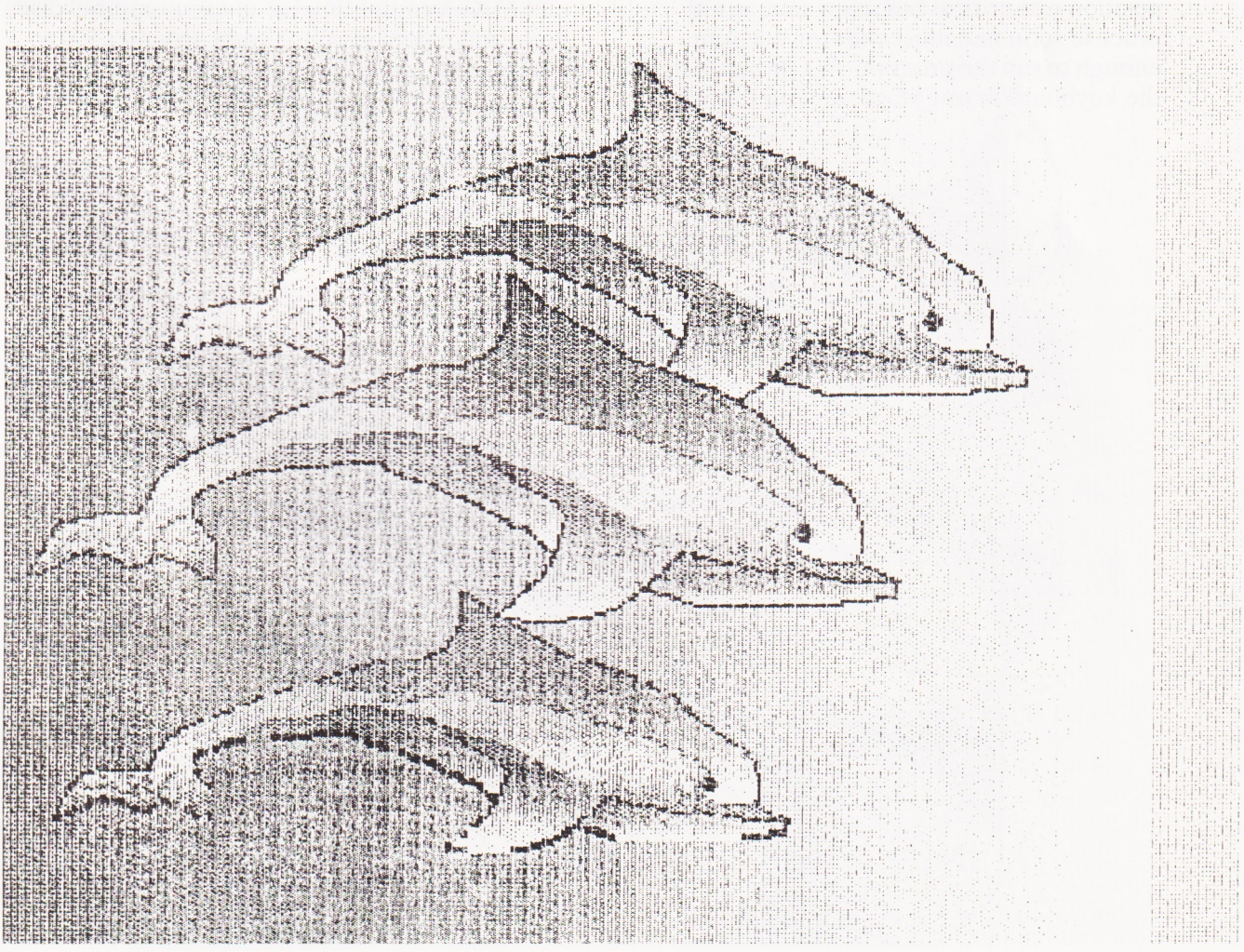


Figure 1

outline of the creature. After that the mouse was the property of the children doing the drawing and I was left to look on and refer to the handbook as the children asked, 'How can we make the colours run together?' or 'Can we get some lighter shades of blue?'

The answer to the first question was simple once we had put down the book and started to click the two buttons on the mouse. The second question was even easier to answer. Yes! In fact we could have over thirty shades of blue if we so wished.

The program was easy to access. My own son who was nearing his third birthday was soon able to start up the disc and begin pattern making with no help from his older sister. Some teachers took longer to teach but one must expect such problems with adults. One great advantage over art packages for the BBC micro is that the mouse has only two buttons – one to do the obvious, the other to bring up a menu for further control of the system or simply to access commands which would normally be obtained via the keyboard. We did find that pointer position was critical but a few minutes of practise soon had most children accurate enough to run the program. We did, in fact, lose the keyboard at one stage under a pile of artwork. The mouse was all we needed except when entering file names.

The flexibility of *Deluxe Paint II* is most impressive. Two attributes which we found most useful were the colour and brush control. With the brush one can draw on the screen and then pick up the image and draw with it. The cavemen were drawn using this technique. The colour control is real control, not just scrolling through a limited number of preset colours but total control of all aspects of all colours. These colours are then saved with the image so that when interesting combinations of colours are developed they can be accessed easily and used over and over again.

Deluxe Paint II cannot be compared with art packages for the BBC B and Master series computers. The AMIGA 500 is a 500K machine. For those who have forgotten, the BBC B has 32K of memory and art packages written for it have all the subtlety of drawing with a dinosaur. Neither will I compare *Deluxe Paint II* with Clare's excellent *Artizan* which has been written for the Archimedes. The Commodore package of AMIGA computer plus an extra external disc drive and colour monitor costs around £500 to educational users. Ask your LEA what your school will have to pay for an Archimedes and

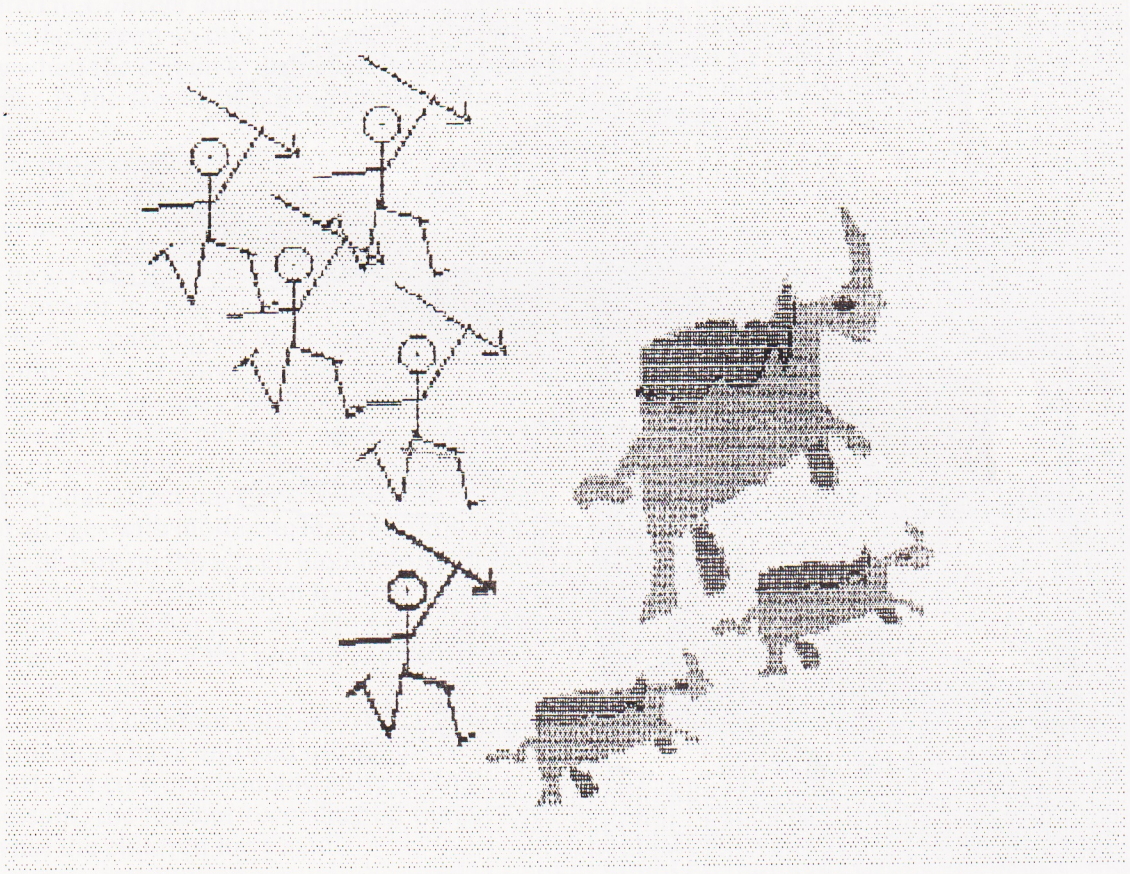


Figure 2

then take a good look at the Commodore AMIGA and ask yourself if this machine will do what we require from a dedicated art machine.

It is as a dedicated art machine that I see AMIGA begin to find a place in our primary schools. HMI tell us in their guidelines for IT that they wish to see children creating artwork on computers. I would say that the computer should be linked to a good colour printer. Most reasonable sized primary schools should be able to afford an AMIGA and colour printer when the bill could come in at less than £1000.

Our own first-year junior children have drawn cave paintings for their stone age topic (Figure 2). Other first years have drawn butterflies to add to their work on symmetry and life cycles (Figure 3).

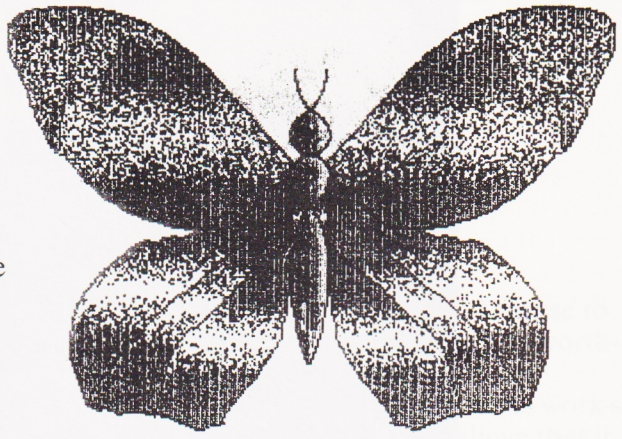


Figure 3

Older children drew aeroplanes, and our fourth-year children did patterns (Figure 4) and the dolphins. This is after only three weeks with the machine. Our children have taken *Deluxe Paint II* to their hearts. They are now able to look at all their artwork with new eyes. Any art package will make children look again at what they attempt in the visual arts but *Deluxe Paint* II is by far the best package that I have seen for children of all ages.

We await a music package with ill-disguised impatience. Already we can hear the five-track stereo on the demonstration disc. Whether or not the software will be of use to primary children we cannot tell until we see it.

I will attempt to keep you informed.

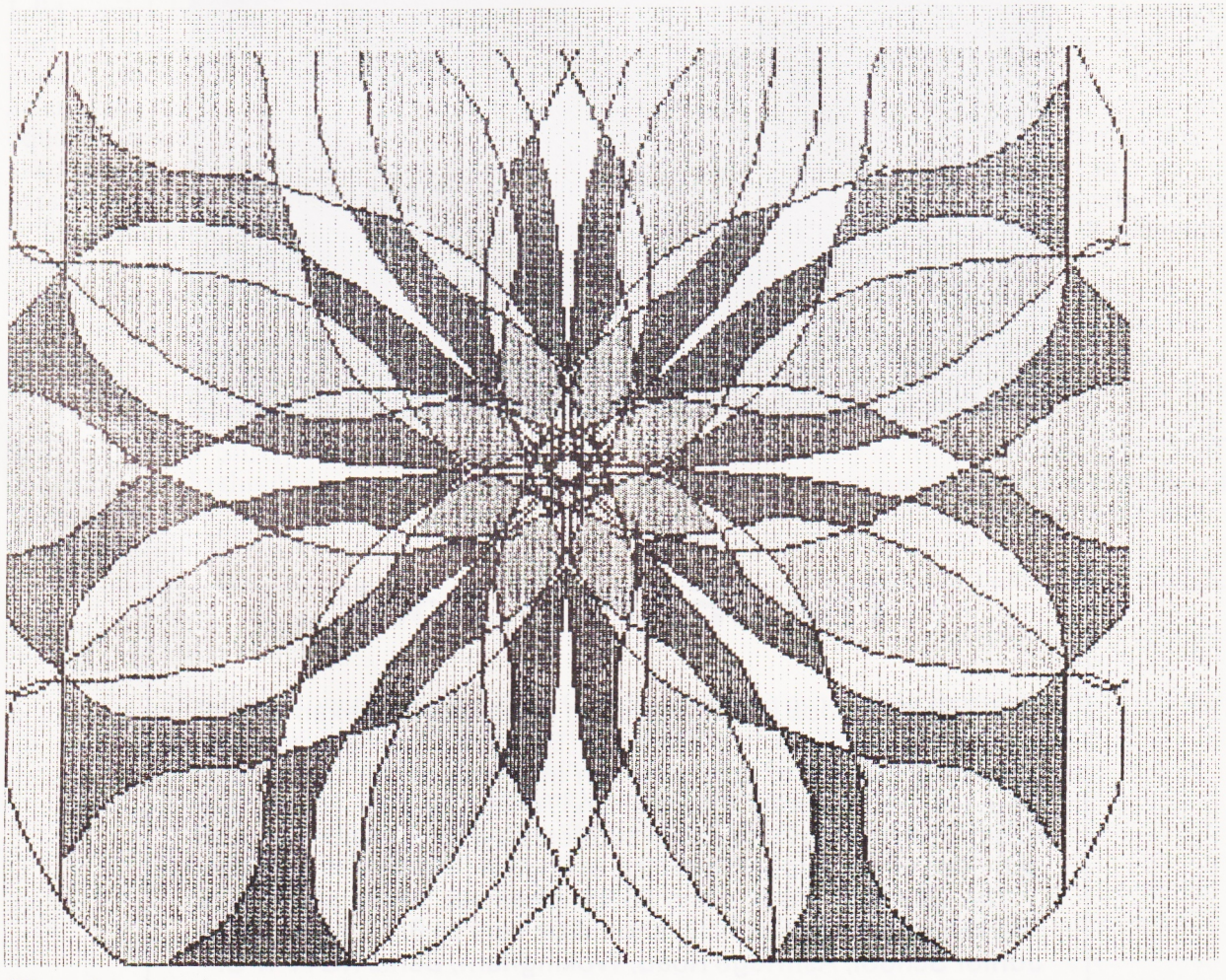
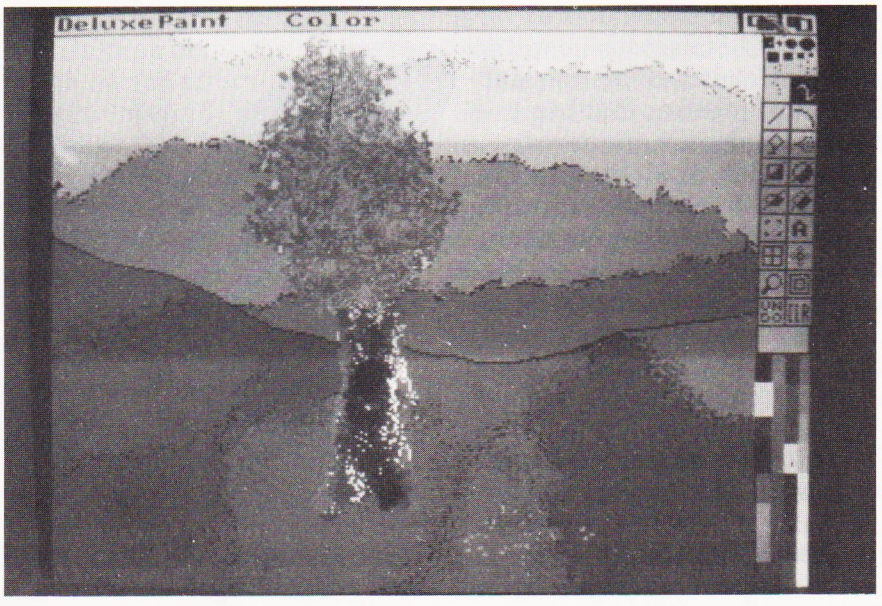
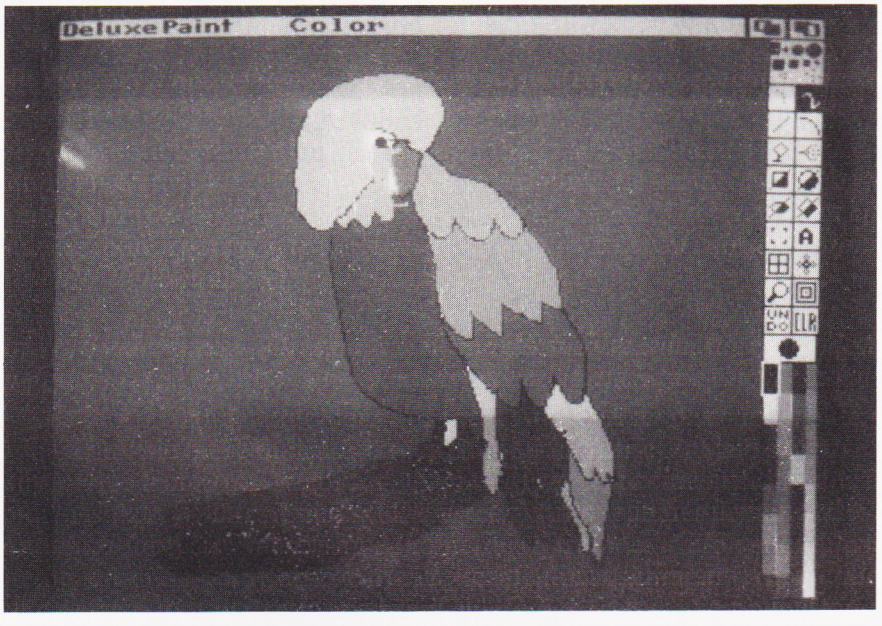


Figure 4





The BEAM IT Book

The BEAM IT Book is a compilation of articles and examples of work by teachers and children in Berkshire primary schools, involving the use of computers in all areas of the curriculum. You can read about Information Technology in Music, art, design, technology and social studies, as well as a wide range of activities which support learning in English, Maths and Science.

The BEAM IT Book costs £5.95. Cheques, made payable to 'Berkshire County Council', should be sent to BITT, Keep Hatch Junior School, Ashridge Road, Wokingham, Berks RG11 1PG.

Conference reflections *or* Sisters, where were you?

Sally Paveley
Advisory Teacher, London Borough of Hounslow

Caerleon was my first MAPE Conference and I would like to begin by saying thank you to the many people who obviously worked extremely hard to make it so enjoyable and informative. The comments which follow are not intended as a criticism of the Conference organisers or delegates, but rather as food for thought for all the readers of this publication.

As I have said, it was my first MAPE Conference and I decided to spend my time attending presentations. I picked up my blue plastic folder, sat down in a comfortable chair, and began to read through the list in order to plan my time. As I did this I became increasingly aware of the fact that most of the presenters were men. I did a quick head count and sure enough only four of the nineteen were women. A similar pattern emerged with the themes. I looked around the room; there appeared to be a fairly equal distribution of men and women. So why, I asked myself, had so few women chosen to present their work?

The reluctance of women to put themselves forward publicly is, unfortunately, a fairly common phenomenon. Modesty is a virtue which has been nurtured carefully in women over the centuries! Yet many of the women at the Conference were advisory teachers who must be used to leading discussions and demonstrations. Surely they would not lack the confidence to do this in an unfamiliar setting? Perhaps the additional workload of preparing a theme or presentation was more difficult for women with family commitments? I refuse to believe that the women simply had less worthwhile work to present!

Does it really matter who presents the work so long as it is worth presenting? I believe that it does. It is now common knowledge that girls tend to regard computers as 'boys' toys'. The low number of girls taking computer courses in higher education is giving such cause for concern that schemes to attract them are being designed! It is the anticipated drop in the number of school leavers in the near future, rather than any real desire to provide girls with the same career opportunities as boys, that appears to lie at the root of such concern. Nonetheless the point that girls are failing to take up the New Technology, and therefore to benefit from the possibilities it has to offer, has been acknowledged. I would suggest that the lack of women at the forefront of this year's Conference is a symptom of this phenomenon. I may be wrong, but can it be entirely coincidental that the girls in schools are behaving in a similar way to their adult educators and role models?

I would like to conclude on a positive note. We are instigators of change working with the technology of change. We *can* find ways of changing our behaviour and in doing so we may begin to redress the imbalance which so clearly fails to benefit any of us. As I stated at the start these thoughts are not intended as a criticism of anybody but rather as points for you to consider and act upon as you choose.

Bronwen Roberts and Margaret Carlshausen have produced a short account of design and technological activities undertaken by young children in their classes. Their 20-page book *Infant Design and Technology* costs £3.50 (inclusive of postage and packing), and can be obtained from Mrs M. Carlshausen, 26 Carne View Road, Probus, Truro, Cornwall TR2 4HZ; Tel 0726 883423.

MAPE software information

MAPE software is distributed free of charge only to those people who are members at the time of publication. However, those who subsequently join may still obtain copies of the software.

MAPE Tapes 1–3 (on disc now) were produced a number of years ago. A selection of the better programs has been collated in order to produce:

The MAPE Compendium
Micro: BBC, RM480Z
Cost: £8.00

The programs included are:
Canal Locks, which simulates the way lock gates work;
Mangonel, which allows you to investigate the workings of a Roman catapault;
Marsh, a problem-solving activity;
Mallory Manor, the famous detective game;
Crackit, in which you crack the code;
Pattern, a simple pattern creation activity;
Front Page Extra, the easiest and simplest newspaper program;
Mousey, a shape matching activity.

and, in addition:
BBC only: *Jumbo*, a problem-solving activity involving a crane and an elephant;
Deetree, a branching tree program for information handling.

RM480Z only: *Treasurer Hunt*, an adventure game for the very young;
Picture Builder, in which you construct pictures and patterns by operating on a range of given shapes.

Also available:

MAPE Tape 4 (on disc)
Micro: BBC, RM480Z
Cost: £6.50

This includes the following programs:
BBC: *Pond Dipping*, which simulates a systematic exploration of a pond;
Magic Telephone (Part 1), a pictorial adventure game;
News Bulletin, which allows you to produce an electronic magazine;
Topol, a problem-solving game.

RM480Z: *Adventure Story* and *Adventure Editor*, which allows you to create and edit branching stories;
Picasso, a picture creation package.

And the latest offerings:

MAPE Owl Pack (software and resources)
Micro: BBC (B and Master), RM480Z, RM Nimbus
Cost: £12.50
£7.50 to new members of MAPE
£9.50 for bulk purchases (more than 20)

A whole resource pack for very young children on the topic of owls: postcards, posters, story book, database, fact sheets and software.

MAPE Tape 6
Micro: BBC (B and Master), RM480Z (*Orb of Zalibar* only), RM Nimbus
Cost: £12.50
£5.00 to new members of MAPE
£9.50 for bulk purchases (more than 20)

MAPE 6 includes *Stylus*, an introductory word processor (an update of *Concept Writer*) and *The Orb of Zalibar* adventure game.

(Please note that if you require the Nimbus versions of MAPE Tapes 5 or 6, could you enclose a blank formatted disc.)

Please send orders (include information about the type of micro) to:

MAPE Information Officer
Computer Centre
Newman College
Bartley Green
Birmingham B32 3NT

Please make your cheques payable to MAPE.

MAPE news

MAPE in Ireland

The 1988/89 educational year has been a period of growth for MAPE in Ireland. Membership has grown to around 150. The normal pattern of monthly workshops in Belfast has been continued and these attracted an average of some twenty-four participants. The wine and cheese 'Open Evening' proved a very popular way to begin the school year, with over fifty teachers, advisers and inspectors attending, and this has been repeated in September 1989. In March we held a most successful two-day course/conference in Stranmillis College. We were indebted to Roger Keeling, Alison Galbraith and Andre Wagstaff who were good enough to venture across the sea to help the proceedings along. The committee worked extremely hard on mounting the event and were more than adequately rewarded by a turn-out of over 120 teachers. The feed-back from these souls who gave up their leisure time willingly to attend was very encouraging and plans are well under way for a bigger and (we hope) even better event in the spring of 1990.

Ulster Bank/MAPE
Primary Schools' Computer Competition 1989

This year our annual £1000 competition attracted a record number of entries from across the Province. As in previous years, the task facing the schools was to produce a class project in which the microcomputer is used to enrich and extend work across the primary school curriculum. The twenty finalists brought their projects to Stranmillis College and put them on public display in the College Hall during the week 12–16 June.

This year Gray Horner (the 'Mr MAPE' of Ulster) had the unenviable task of judging the entries. After several lengthy sessions viewing the displays during which time he enlisted the assistance of his colleague Ron Cromie, and a two hour session interviewing the children from the schools involved, the following schools' projects were proclaimed as winners.

Overall Winner
Cookstown Primary School with their project 'Water'.
Prize: a complete BBC Master Compact computer system.

P.1/3 Winner
Annahilt Primary School with their project 'The Farm'.
Prize: an Epson LX800 Printer.

P.4/5 Winner
St. Paul's Primary School (Irvinestown) with their project 'Eyes'.
Prize: an Epson LX800 Printer.

Special Section Winner
Glasvey Special School (Limavady) with their project 'All About Me'.
Prize: an Epson LX800 Printer.

The regional MAPE Committee are indebted to the Ulster Bank for their continued sponsorship of this prestigious event and to C.E.M. for supplying the hardware prizes. We would also like to thank all five Local Area Boards for their support in organising the heats and for donating prizes of software packages for all competing schools.

Pete Young

MAPE South West
The Medium is Not the Message

It's the writing that's important: not the computer. This was the message of Peter Hunter, the author of *Pendown*, at the MAPE (S.W.) May event at Rolle College, Exmouth. A group of about thirty teachers from all over Devon listened, tried *Pendown* and *Front Page Extra*. Their enthusiasm shone through despite the call of the sea nearby – on the hottest day so far this year – and despite the temptations of Cup Final day.

Peter Hunter explained how writing came about as a response to developing needs in society – for example cuneiform writing in Sumaria began as a means of stocktaking of sheep and goats. The purposes to which it is put have grown ever since, as have the means of writing – from stylus to ball-point pen. The computer is part of that developing technology, but it will not replace handwriting; what it does is to bring a new freedom – a freedom to compose at the keyboard. He was emphatic that those who prepare writing in rough and use the computer to produce a 'neat' copy are wasting the resource! A piece of writing may be begun,

developed, revised and edited several times. This takes time, but children are more receptive and constructive about changes in their work as they become distanced from it by both time and emotion. This way they become real authors!

We heard about the speech-driven word processor which will give a child who cannot read the ability to write; of new skills of developing graphic layout to convey meaning . . . the future is exciting.

After lunch in the sun, or a walk on the beach, the group got some hands-on experience. They used *Pendown* to develop note-taking skills. A group would list words associated with a specific topic, e.g. ears, Tetbury, architecture. . . . The next group put these in sentences. Collaborative news articles were made from outline plots using *Front Page Extra*.

These skills of notetaking and developing writing from notes are increasingly important in our fast-moving society.

Look out for more thought-provoking and action-packed days from MAPE South West.

Judy Gale
Cullompton Junior School, Devon

North Wales

There's hope yet!
Even though an attempt to get a 'regional meeting' failed through lack of response to a circular sent round to all primary schools in Gwynedd and Clwyd, the advert asking for volunteers to serve on the Regional Committee, in the last copy of *MICRO-SCOPE*, produced two offers of help to get the Region moving. This means that there are now five who have declared their support.

It is now intended that a Regional Committee meeting should take place in November with the intention of arranging a MAPE day at a Clwyd school before the Christmas break.

My own involvement in matters other than MAPE has recently prevented me from being as diligent or swift as I would have wished in replying to some of the enquiries. I must sincerely apologise to the people that this concerns who should now have received some communication from me.

I look forward to an increasingly high profile of MAPE in the North Wales region, and would like to repeat the request for help from anyone interested. Maybe a sub-regional group could form in an area where there is a nucleus of support. (Our main problems lie in the large distances that are involved in areas where public transport is negligible.)

Dave Siviter

MAPE Conference 1990

Venue: Nottingham University
Dates: 6–8 April 1990

invites anyone interested in making a presentation (60–90 minutes), to submit a resumé by 31 December 1989 to: Stan Norman, 70 Mouth Pleasant, Keyworth, Notts NG12 5EH

The theme of next year's Conference is IT and the National Curriculum.

The Conference organisers particularly wish to hear from practising classroom teachers who have real experience of using IT within the Primary Curriculum.

The organizers are prepared to make a payment of £25 per presentation. It is anticipated that each presentation would normally be repeated once.

MAPE National Committee Members 1989

Chairman — Roger Keeling, Newman College, Genners Lane, Bartley Green, Birmingham B32 3NT.
Tel: 021 476 1181 TTNS YLJ008

Treasurer — Keith Whiting, 149 Sherbourne Avenue, Nuneaton, Warwickshire CV10 9JN.
Tel: 0203 396132

Secretary — Anne Liddle, Pentland Primary School, Pentland Avenue, Billingham, Cleveland TS23 2RG.
Tel: 0642 552848 Home 0642 781546 TTNS YLV097

MICRO-SCOPE Editor — Senga Whiteman, Newman College, Genners Lane, Bartley Green, Birmingham B32 3NT.
Tel: 021 476 1181 TTNS YLJ008

MAPE Administration — Mrs G.E. Jones (MAPE), 'The Old Vicarage', Skegby Road, Normanton on Trent, Notts NG23 6BR.
TTNS YNE070 FAX 0522 45584

Regional Representatives

CHILTERN
Betty Lumley
26a Chamberlain Way,
Pinner, Middx HA5 2AY
Tel. 01 866 0827
LEAs
Barnet, Bedfordshire, Brent, Buckinghamshire, Ealing, Enfield, Haringey, Harrow, Hertfordshire, Hounslow, Hillingdon, Northamptonshire, Oxfordshire
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Tel. 0242 513836 TTNS HFE111
LEAs
Somerset, Avon, Wiltshire, Glouc s
Code 08

IRELAND
Pete Young, Strand Primary School,
78 Gilnahirk Road, Belfast BT5 7DJ
Tel. 793136 (home)
Code 14

NORTHERN
Alison Galbraith, 34 Bristol Street,
New Hartley, Whitley Bay,
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LEAs
Cleveland, Cumbria, Durham,
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NORTH WALES
Dave Siviter
Cilgeraint Farm,
St Anns, nr Bethesda,
Gwynedd LL57 4AX
Tel. 0248 600612
BTG 74: MIK2080
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Clwyd, Gwynedd, Powys (Montgomery)
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Barry Wake,
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CO-OPTED MEMBERS
Ron Jones, 'The Old Vicarage',
Skegby Road, Normanton on
Trent, Notts NG23 6BR
Tel. 0522 754408 TTNS YNE070
FAX 0522 45584

André Wagstaff, NCET,
Unit 6, Sir William Lyons Rd.,
Science Park, University of Warwick,
Coventry CV4 7EZ
Tel. 0203 416994 TTNS TCD024

Les Watson, College of St Paul and St Mary, The Park,
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Nottingham University

Micros and Primary Education

April 6,7,8

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