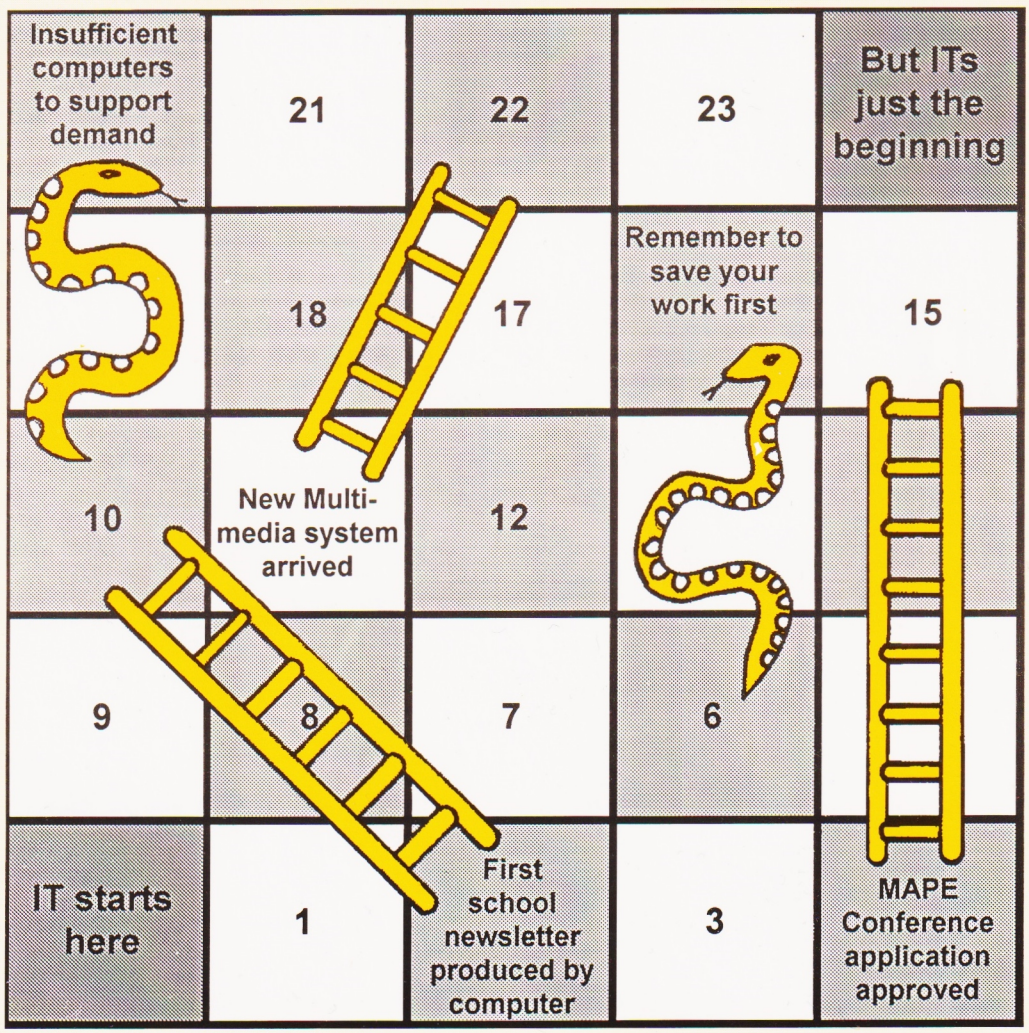
MICRO-SCOPE

► Special

► in collaboration with NCET

► Autumn 1994

IT Starts Here!



NEWMAN COLLEGE with MAPE

Contents

MAPE is grateful to NCET for their support in agreeing to the reprint of their information sheets in this publication.

Editor: Chris Robson
Contributors: Anne Farr, Roger Keeling, Chris Robson, Janice Staines, Senga Whiteman
Cover designs: Eddie Pope/Terry Prosser/Barbara Faux

ISSN 0264-3847

Correspondence to the Editor: *MICRO-SCOPE,* 99 Foxcote, Wokingham, Berkshire RG11 3PG.

MAPE (Micros And Primary Education) is open to individuals and institutions. The current subscription of £15 pa UK; £10 pa students; £20 pa overseas; includes direct mailing of *MICRO-SCOPE.*
Application forms from: Mrs G Jones, 'The Old Vicarage', Skegby Road, Normanton on Trent, Notts NG23 6RR

Published by Castlefield (Publishers) Ltd

Individual copies from: Castlefield (Publishers) Ltd, Castlefield House, 12 Headlands, Kettering, Northants NN15 7HP

MAPE reference for Income and Corporation Tax relief on membership fee: T1644/23/1968/MT
Charity Commission reference: OSP-292898-R Reg No 292898

VAT Number: 544 8661 18

Produced by The Castlefield Press, Kettering, Northants

Introduction

Senga Whiteman
Newman College

Although computers have been in schools for a number of years now, there is always more to learn about the ways in which they can be integrated into the curriculum. Just when you think you've got to grips with things, either a new micro hits the desks, or your favourite program is updated and changes beyond recognition. We often feel as if we are starting again although we are consolidating past experiences at the same time. This publication is designed for anyone who needs to know more about specific aspects of Information Technology. You might be beginning your teaching career. You might be starting a new job in a school with different micros from those you are used to. Your school might have changed its purchasing policy. We hope that the contents will support each of these situations and many more.

Firstly, a few words about MAPE. We are an organisation which exists to promote the use of Information Technology within the Primary curriculum. Our members are teachers, advisory teachers, lecturers, advisers, inspectors and students. We offer a termly journal and 'Specials' – this publication fits into the latter category – in which the focus is on one specific aspect of IT. We hold national and regional events. We offer a network of support. If we don't know the answer to a specific question, we almost certainly know a person who does!

This publication focuses on issues relating to organisation, management, professional development and assessment. If you usually feel overawed by the jargon used by 'Techies' don't panic – our articles are fairly jargon free, and, in case we slip occasionally, we've included a guide to some of the more commonly used expressions. There will always be those who talk in a foreign language, using expressions like 'Mine's got two thousand million gigabytes and . . .', but don't worry, not understanding is a sign that you're still a member of the human race rather than a Being from the planet TechFreak.

There's nothing worse than a computer that doesn't work. You try everything and it just sits there. You try everything again, in a different order, and it just sits there. You get very cross and it just sits there. We can't prepare for every eventuality but we have included some suggestions for dealing with uncooperative hardware and software (and pupils). Our advice is, don't take it personally; it usually isn't you, it's the equipment that's gone wrong. Wires inside leads can break, fuses blow, discs corrupt. We can help you to identify the fault – that's a positive step towards getting it rectified. We've included a problem page; it's not quite as riveting as those in magazines designed for teenagers, but it does highlight common difficulties.

There are several sources of help and advice to whom you can turn. There's MAPE for starters, then there's the National Council for Educational Technology (NCET), whom we thank for permission to include many of their help and information sheets in this publication. We've included a list of other useful sources of support.

Just when you thought you knew the curriculum – it changed. With the new Orders in the process of being developed (or should that be ratified), we've included some advice about the kinds of activities that are appropriate for different aspects of IT use, with different ages of children. It bears repeating that progression doesn't mean using a more complex program, it means offering the children a more complex/sophisticated learning activity.

The newspapers refer, occasionally now, to people being fined huge sums of money for breaching copyright regulations. We've included a brief summary of the implications of the current regulations. If you, or your school, didn't buy the software (from your LEA, a software company, or a hardware manufacturer), then you need to check the legality of using that program. If the disc is unlabelled, and you've never seen any documentation, warning bells should start to ring. Software piracy is theft.

There's an article which provides guidance about integrating Information Technology into your classroom activities, and some questions to help you find out whether or not you have achieved this. We've included some teachers talking about their feelings about IT and also some case studies which show IT in action.

This publication is designed to be 'dipped into' as necessary. It's a resource to keep to hand although you might like to copy certain articles (fault diagnosis?) and stick them on the wall. We believe that every article will be of value at one time or another. If you feel that we've missed something major, then please tell us. We can always respond in future issues of *MICRO-SCOPE.*

IT starts here and, as experience teaches us, IT never ends! Bon Voyage.

Information Technology – why bother?

What is I.T.?

Information Technology (I.T.) is concerned with the storage, processing and presentation of information by electronic means. Computers and microelectronic devices are built into washing machines, tape recorders, video recorders and many other everyday objects in the home and workplace.

Why is I.T. important?

I.T. is playing an increasingly large role in all areas of life – the home, the workplace and leisure pursuits – so we all need to develop the skills that will help us to cope with our rapidly developing and changing technological world.

Getting to grips with technology will help you to save time and do more efficiently things you need to do regularly. You will also be able to use it to help the your pupils to learn and be better prepared for their adult life. What I.T. can do for children and why it is important to the curriculum is explained below but, remember, you too can benefit from using it in the same ways.

What does I.T. help children do?

I.T. allows children to:

- draft and redraft their work with less effort than with pencil and paper
- combine words and images to produce a 'professional' looking piece of work
- test out ideas and present them in different ways for different audiences
- explore musical sequences and compose their own tunes without needing a wide knowledge of music
- investigate and make changes in computer models and see what happens as a result
- store and handle large amounts of information in different ways
- do things very quickly and easily which would be tedious or time-consuming if done by hand
- experience, through simulations, things that would be too difficult or dangerous for them to attempt in real life
- control devices by turning motors, buzzers and lights on or off, or by programming them to react to changes in things like light or temperature sensors
- communicate with others over a distance via fax machines, satellite links or electronic mail.

Why is it important for children to use I.T. in school?

Children using I.T. in school are usually more motivated and will concentrate on a task for much longer than normal. They develop social and communication skills through collaboration and team work. They develop increased confidence and self-esteem as they experience success, and acquire a positive attitude to 'error' making. They are able to plan more effectively and are more confident in dealing with problems.

In addition, I.T. can enhance and extend children's learning in many subject areas. In mathematics, for example, children can quickly and easily draw shapes and graphs on screen. They can explore mathematical ideas and concepts through computer models and simulations. In giving instructions to a screen or floor robot they can more easily understand concepts such as negative numbers.

In science, children can use sensors to log things like room temperature over a period of time or to test which materials are the most effective insulators. Their results can be displayed in graphical form and the children can 'tell the story' of their graphs.

What does the National Curriculum say about Information Technology?

I.T. is incorporated in the National Curriculum for two reasons:

- to extend and enhance learning in all the subject areas
- to help the child develop I.T. capability.

I.T. capability will be developed progressively over a child's school life through a range of experiences matched with opportunities for reflection on the appropriateness and relevance of its use in and out of school. All children develop and learn at their own pace. The foundations of I.T. capability will be laid during the primary stage of education and extended and developed further during the later stages.

The National Curriculum outlines the I.T. experiences and understanding which a child should have in order to develop I.T. capability. This is organised into five strands:

- communicating information
- handling information
- measurement and control
- modelling
- applications and effects.

Communicating Information involves children using words, sounds and images to present ideas in different ways. They draft and redraft their work to refine their thinking and to present their work in different formats and for different audiences.

Handling Information encourages children to pose questions and hypotheses and to collect the data needed to allow them to find answers, or to verify their thinking by spotting patterns and relationships in the data they have collected. They are encouraged to collect, store, retrieve, manipulate, interrogate and present their work in the most appropriate form.

Measurement and Control involves children giving sequences of instructions to control devices and to use instruments like light or temperature sensors to measure changes in the environment.

Modelling encourages children to detect patterns or rules and to explain how those rules are working. They are also encouraged to asked 'What if...?' type questions, by changing the rules and seeing what happens as a result of their changes.

Applications and Effects requires children to reflect on their own use of I.T. in order to explore whether they have used it effectively and to notice how I.T. is used in everyday life. They are encouraged to discuss the use of I.T. in electrical appliances in the home or their own toys. They are also encouraged to notice the use of I.T. in everyday devices like automatic doors, the check-out at the supermarket or the cash dispenser at a bank. In addition, it urges children to consider the ethics of personal information being stored on computers.

Much of the work done at the early levels of developing I.T. capability involves children working on activities which do not necessarily involve the use of I.T. For example, when children are learning to handle information they will spend a lot of time sorting and arranging sets of objects in different ways, and this will help them to understand how a computer database will classify and sort data.

What is I.T. capability?

A child who has developed I.T. capability should:

- be confident in her or his use of I.T.
- select and use I.T. appropriate to the task
- identify situations where the use of I.T. would be relevant
- be able to reflect and comment on the use of I.T. s/he has made
- recognise that I.T. affects the way in which people live and work.

Getting started with computers

Despite the spread of information technology into nearly every sector of our lives, people are still put off by the mystique of computers. Technology is all around us, however, and often we don't worry about it. Most people who are scared of computers cope quite happily with a washing machine, electric alarm clock, cooker timer or bank cashpoint. Of course, it's one thing to be on the receiving end, and quite another thing to use them ourselves. That's when the panic really sets in. Ideally, computers should enable us to save time or do more efficiently things we need to do regularly.

Here are some suggestions to help you get started. The commonest packages used in business, the home and education are the word processor and the spreadsheet.

What is a word processor?

A word processor is a software package which helps users to compose and edit text on a computer. It is much more than a typewriter because the user can move text around the screen so, for example, you can *cut out* a paragraph in the middle of a letter and *paste* it at the end.

To use a word processor you need only be able to:

- load the software
- enter text
- edit text
- save text
- load text
- print.

Once you can do this, you have mastered the basics of word processing. Overleaf is a checklist of skills for you to keep track of your own learning. The list might look a bit daunting at first but it covers all the important skills and gives you a route through your manual. Use the index in your manual to find out how to carry out one of these functions and then practise it.

What is a spreadsheet?

A spreadsheet handles information, usually numbers, in a grid. It has columns which go down the page and rows which go across. The individual squares of a grid are called cells. A cell can be given a formula so that it carries out a particular function, such as adding all the figures in the column above. Even if you change every one of the figures in the columns, the spreadsheet will still add them up.

To use a spreadsheet you only need to be able to:

- load the software
- enter the data
- edit data
- save the datafile
- load the datafile
- print.

Once again, have a look at the checklist (over) and use it to work through your software manual at your own pace.

These ideas are taken from the BBC booklet *Computing for the Terrified.* Both this booklet, and a Projects Pack to accompany the new BBC series *Computing for the Less Terrified*, are available from BSS, P.O. Box 7, London W3 6XJ.

Word Processor: Action log

	I can do this	I need help
1 Load the software		
Open a new file		
2 Enter text		
Use the *cursor* key		
Use the *shift* key for a single capital letter		
Use the *caps* key		
Use the *enter/return* key		
3 Edit text		
Move through a document using page up/page down		
Delete a word		
Delete a piece of text		
Insert a piece of text		
Select and move a piece of text		
Use "undo typing"		
Put a heading in bold		
Put a heading in italic		
4 Save text		
Give the file a name		
5 Load text		
Load an existing file		
6 Print		

Spreadsheet: Action Log

	I can do this	I need help
1 Load the software		
Open a file		
2 Enter data		
Use the cursor key		
Understand the cell references		
Enter a number in a cell		
Enter a formula in a cell		
Select a range of cells		
Enter decimal numbers		
3 Edit data		
Move cursor around the spreadsheet		
Alter the number in a cell		
Add a range of numbers		
Change column widths		
Delete the contents of a cell		
Call up a chart		
4 Save the datafile		
Give the file a name		
5 Load the datafile		
Load an existing file		
6 Print		

Pupil Profile

These pupil profiles are intended to:

Key Stage 1

- give students and teachers a feel for the sorts of activities that children at differing stages of I.T. capability might be involved with
- provide pointers for the types of things that children can show they are able to do
- indicate the sorts of things that children at different stages can say about their work
- indicate the kinds of discussions they might be having
- suggest the questions children might be asking and decisions they might be able to make about how they approach their work.

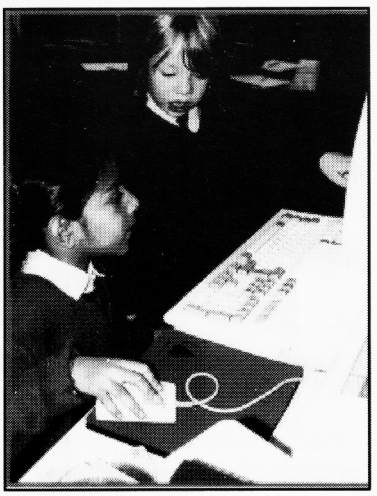
The teacher's notes are intended to suggest the kind of notes it might be useful to keep over a period of time in order to help teachers in their assessment of a child's progress in I.T. These notes are presented in more detail than those you would keep for each child in your class. It is important, however, that a regular note is made showing the date, some indication of the context being used and the evidence that has been witnessed. These notes should be made over a period of a year or key stage and should occasionally be supplemented with examples of the child's work.

In addition to the teacher's comments we have indicated which strand of I.T. Capability the child is addressing. For the purposes of these profiles we have used the following abbreviations:

CI	–	**Communicating Information**
HI	–	**Handling Information**
M	–	**Modelling**
M&C	–	**Measurement and Control**
A&E	–	**Applications and Effects.**

These profiles are from *Building I.T. Capability*, NCET, 1993.

Rapinder



As part of a topic looking at life in Tudor times, Rapinder was able to use the computer to design a dress for one of the Tudor women at Hampton Court. She was confidently able to use the mouse to select the Tudor roses and the other decorations to fit into the dress outline.

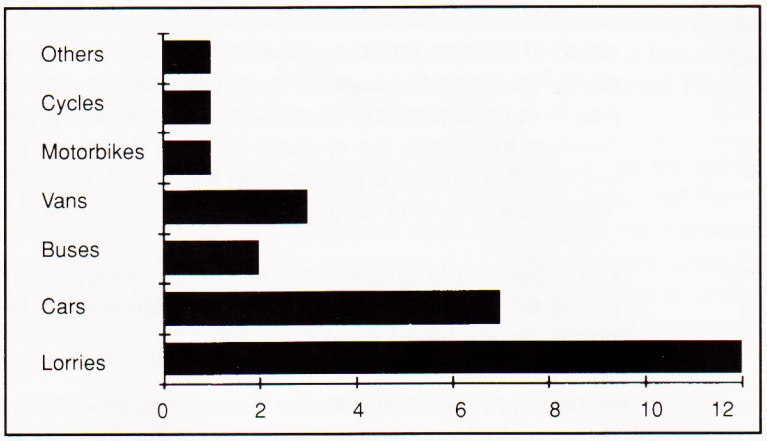
Communicating Information

After a talk on road safety given by the school's community policeman, Rapinder worked with a friend and they took it in turns to use the computer keyboard to type in the words to match road signs that appeared on the screen. Rapinder then coloured in the print-outs of her signs to put in her topic folder. Rapinder also used an overlay keyboard with words on the overlay relating to road safety and supplemented these words by using the computer

keyboard to create the text for a poster on road safety. She painted a picture to illustrate her poster and pasted the words and picture together.

Handling Information

During her time in the role-play area, Rapinder used a multilingual word processor to create messages in Panjabi about road traffic accidents which she then gave to other Panjabi-speaking children in the school.



Traffic passing the school at Monday lunchtime

Rapinder and her friend drew pictures of the kinds of vehicles which regularly pass the school and pasted these onto an overlay. They then used the overlay keyboard to record the number of vehicles passing the school during a five-minute period. They also used the computer to draw a bar chart of the vehicles and printed this out. Rapinder decided they should repeat their survey at different times of the day to see when were the busiest times for traffic. Rapinder was able to talk about which were the most common vehicles passing the school and to compare their print-outs to see which times of day were the busiest for traffic passing the school.

Rapinder used a 'free text' database to type in descriptions of various road signs and what they meant. Since she hadn't finish typing in all the signs before home time, she was helped to save her descriptions onto disc. The following morning she loaded her work back into the computer and continued adding her descriptions. She spotted that road signs are made up of just a few shapes and that a limited number of colours are used on them. She printed out her descriptions and added them to her 'Road Safety' folder.

As part of her science work, Rapinder described different materials and then sorted them into labelled hoops using the criteria of 'comes from animals', 'comes from plants', and 'man-made'. She then created a 'binary tree' by framing questions which could only be answered 'yes' or 'no' until she was able to individually identify each of the pieces of material. Rapinder used a computer 'branching' database to enter the information from her 'tree' and asked one of her friends to 'test' her tree. Rapinder printed a copy of her tree and the questions she had asked to stick in her science book.

Modelling

Rapinder and her friend used an overlay keyboard with an overlay showing the outline of a castle and the surrounding countryside. They used the messages which appeared on the screen to help them draw a plan of what appeared in the scene. Once they were happy that everything within their plan was in the right place they set to work to construct a 3-D model of the castle and its surroundings.

Measurement and Control

Rapinder used the school tape recorder to interview a number of children about some of the dangers they face from traffic when they walk to school. She confidently operated the buttons to record, rewind, play back her recordings and pause in between each one. She is also able to operate the remote control handset to change the channel on the TV and to increase or decrease the volume, brightness and colour. In PE, Rapinder enjoys playing games like 'Simon Says' and is very good at following the instructions or directions given.

Applications and Effects

Rapinder is able to talk about how the computer can store lots of information in its memory and on disc and that this information can be used over and over again without being 'forgotten'.

Rapinder knows that she can use a word processor to enable her to write Panjabi characters. She chose to use the Panjabi word processor when she wanted to share her work with other Panjabi-speaking children.

When Rapinder visited the supermarket she was able to describe the way in which the sensors above the doors knew when someone was approaching them and send a signal to open the doors to let them in. She also spotted that as she passed through the gate at the entrance she was 'getting in the way' of a light beam which made the gate open to allow her to pass through.

Pupil Record – Rapinder

11 September	Rapinder and Shui designed a dress for a lady-in-waiting at Hampton Court. They used the Tudor roses to make a border for their design and stuck the print-outs in their topic folders (CI).
16 - 25 September	Rapinder and Katie drew pictures of the different vehicles they noticed passing the school. We made their pictures into an overlay. (HI) They then recorded the vehicles passing the school over a 5-minute period by pressing on the right picture for each vehicle. They used the computer to make a bar chart of the traffic and printed it out. They repeated their survey at different times of day over the week and compared their graphs (HI).
28 - 29 September	Rapinder and Katie matched road signs and their meanings by typing in the words to go with the sign. They printed out their signs, coloured them in and put them in their topic folder (CI). Rapinder used the Panjabi word processor to produce messages about traffic accidents (CI). She said she used the Panjabi word processor because she wanted other Panjabi speakers to understand her messages (A&E). She also used the 'Road Safety' overlay to print out the text for a poster on how to cross the road safely (CI).
5 October	Rapinder typed descriptions of her road signs into the database. She used shape, colour and whether the sign had words on it as her key-word labels. She saved her work to continue working on it tomorrow (HI). Rapinder said that it was good that the computer could store lots of information in its memory and that it could be stored on disc so that it could be used over and over again (early A&E).
6 October	Rapinder loaded in her file of road signs and continued typing in her descriptions. She found that there were only a few different shapes and colours used and that very few had words as well as pictures on them. She said this was probably because it would confuse the drivers (HI).
12 October	Rapinder recorded interviews with a number of the class on dangers they face in crossing the road. She was able to operate the tape recorder without assistance from me (early M&C).
16 October	Rapinder described different materials and sorted them in different ways. She asked what she should do with the materials which were mixed fibres. We decided they should go into the hoop which showed which was the largest component material (early HI).
19 - 21 October	Rapinder worked with Sally to create a 'binary tree' by sorting the materials using questions which could only be answered 'yes' or 'no' (early HI). Rapinder used the computer branching database to enter her questions on the materials. She asked one of her friends to test her tree. She printed out her tree and questions to put in her science book (HI).
4 November	Rapinder played 'Simon Says' in PE and was very good at following the instructions (early M&C). She talked about the TV handset and showed me she could change the channel and increase the volume and change the brightness (early M&C).
18 - 20 November	Rapinder and Katie used the overlay 'Castle' to explore and make a plan of the castle and its surroundings (early M). They then made a model of the castle and its surroundings. They had a lot of discussion about the scale and size of things to go in the castle (early M).
8 December	Rapinder described the way sensors controlled the automatic doors at the supermarket. She also noticed that breaking a light beam controlled the opening of the gate at the entrance (early A&E).

Pupil Profile

Key Stage 2

These pupil profiles are intended to:

- give students and teachers a 'feel' for the sorts of activities that children at differing stages of I.T. capability might be involved with
- provide pointers for the types of things that children can show they are able to do
- indicate the sorts of things that children at different stages can say about their work
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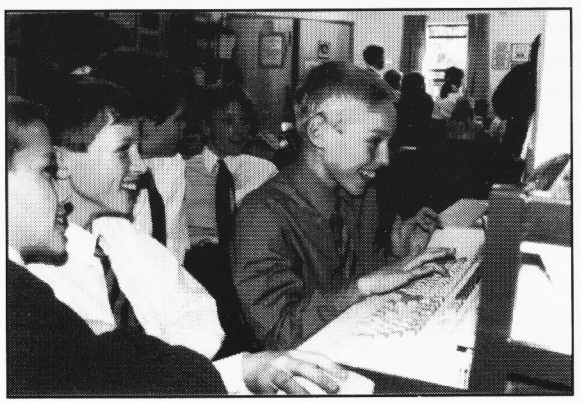
Simon

Handling Information

Using his notes from an interview he had conducted with his grandparents, Simon wrote an account of what life was like when his grandparents were children. He used a painting package to illustrate his work and decided to use a music program to create the music to go with the skipping rhymes which his grandmother used to sing. Simon presented his work to the rest of the class.



For the celebrations of the school's 25th anniversary, Simon worked with his friends to collect information about the families who lived in his street. They prepared their data collection sheets and decided on the questions they would need to ask in order to collect the information they needed. They added their information to the database on the local area that had been built up by children from several classes.

Simon was very interested to see where some of the families had lived before they moved into the area. He

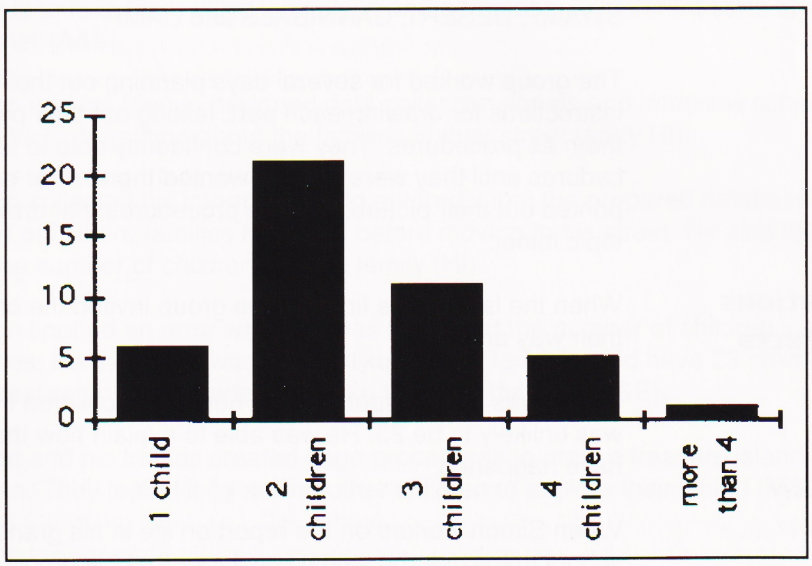
worked out the questions he needed to ask in order to retrieve the information he was interested in, searched the database and produced a graph to show his results. Simon spotted that one family had got two entries on the database and that the information was different in each of the entries. He checked with the children who had collected the information on this family and discovered that one of the entries should have been for the family who lived in the flat upstairs in the house.The entry was changed to show the correct name.

Modelling

When Simon produced graphs of the families in his street he decided he wanted to show the number of children in each family. He was very amused to find that one family seemed to have 23 children! When he checked his collection sheets he found that they only had 2 children and decided that his finger must have hit the 3 key by mistake when he was typing this entry into the database.

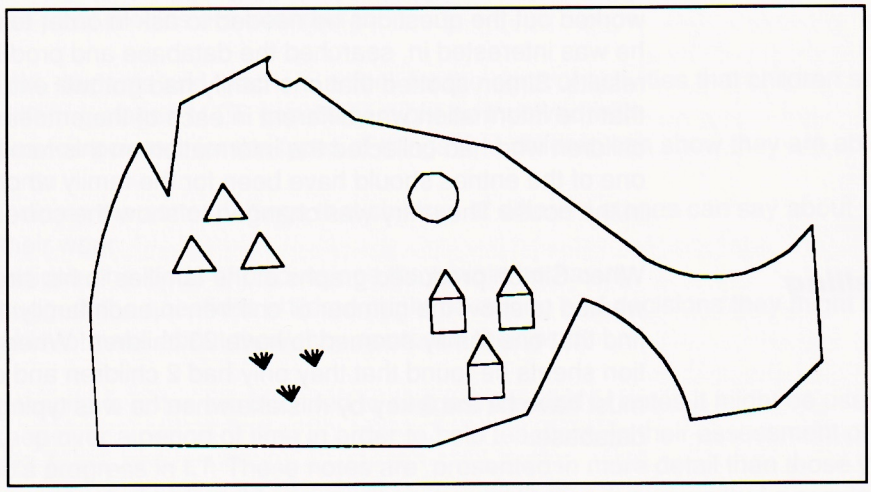
Measurement and Control

As part of his work looking at famous explorers, Simon and his friends used a Logo microworld to steer a ship around various islands. As they entered their commands to move the ship they noticed that something was affecting the way



The number of children in families in my street

their ship was moving. They talked for some time about what might be causing the strange effect and checked that it wasn't simply a problem with the program by loading it again and starting afresh. The same thing happened again as they tried to steer their ship between the islands. Simon noticed that their ship was 'being blown off course' even if they weren't entering any directions and so they decided that there must be a wind blowing that was affecting the ship. They worked out which way and how hard the wind was blowing. They edited the Logo procedures, firstly to stop the wind blowing altogether (that was too easy!) and then to change the direction and speed of the wind. They steered the ship with several different speeds and directions of wind blowing and timed how long it took them for each trip. They challenged other groups to beat their times.



As an extension to their work on famous explorers, Simon and his friends decided to create their own map of a treasure island using Logo and the screen turtle. They create a procedure called MAP which drew everything on the screen. This procedure used other procedures called OUTLINE, SWAMP, DESERT, CANNIBALS and CAMP.

The group worked for several days planning out their map, working out the instructions for drawing each part, testing out their procedures and saving them as procedures. They were confidently able to test and edit their procedures until they were as they wanted them. After each session they printed out their picture, and the procedures that drew it, to include in their topic folder.

Applications and Effects

When the island was finished the group invited the other children to navigate their way around it.

Simon was able to spot that the number of children in the family in his street was unlikely to be 23. He was able to explain how the incorrect entry must have happened.

When Simon worked on the report on life in his grandparents' time for the school magazine, he said it was lucky that his report was saved on the computer or he would have to start writing it all over again.

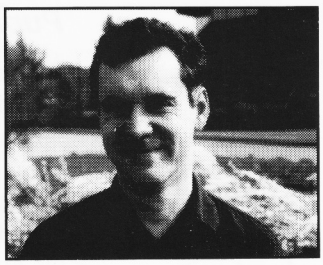
Simon was fascinated by the computer model of the wind blowing his ship off course. He said that the captains of ships and pilots of aeroplanes must have to use computer programs to help them steer their way around the world.

Pupil Record – Simon

21 September	Simon used the word processor to redraft the notes he made on life in his grandparents' time (HI). He said it was lucky that he could use his notes which he had saved before, otherwise he would have had to start all over again (A&E).
24 September	Simon used the painting package to create images of his grandpa and grandma. He played with different colours and screen effects before deciding on his final choice (CI).
22 - 25 September	Simon used the music program to re-create the skipping rhymes which his grandma used to sing. He recorded them onto the tape recorder adding percussion instruments to his computer-generated sounds (CI).
1 - 5 October	Simon and his friends used the Logo Microworld to steer their ship around the islands. They noticed that something was happening to their ship as they steered it. Simon spotted that a wind was blowing it off course. They edited the procedure to try out different wind speeds and directions (M).
5 October	Simon said that captains of ships and pilots of aeroplanes must use computer models to help them steer their ships and aeroplanes in different sorts of weather (A&E).
20 - 23 October	Simon and his friends designed data collection sheets and interview schedules to collect information about the families in their street (early HI).
2 - 6 November	Simon collected his information and entered it into the prepared database. He found out where families had lived before moving to his street. He also found out the number of children in each family (HI). Simon spotted an error when he was looking at the number of children in the families. He thought it was very unlikely that a family would have 23 children and realised he had made a mistake typing in his data (A&E).
8 - 11 December	Simon and his friends created Logo procedures to draw a treasure island on the screen. They tested it by asking other children to explore their island (M&C).

Teachers talking about I.T.

Two teachers from a primary school were asked to talk about their experiences in using I.T. Mrs E is the head of the infant department of the school. Mr Mc is deputy head of the school and teaches a mixed class of Year 5/6 children. The school has taken part in a 'Whole School' I.T. development project run by NCET and is currently part of the NCET Schools Partnership Scheme.



When did you first become interested in using I.T.?

Mr Mc: My interest started in the mid-80s when the LEA seconded a teacher to support local primary schools. He came round with his computer and worked with my class and whipped up great enthusiasm, but he took the computer away again at the end of the day. It was only when we managed to purchase our first computer and it was put in my classroom that I finally had a chance to get my own hands on the computer – and it took off from there.

Mrs E: I think I really became interested in using I.T. with my children when I was asked to take part in a project run by NCET. I thought about giving I.T. a higher priority in the classroom and I was able to see that actually using a computer had tremendous educational value in the classroom with my five-year-olds.

How do you plan your I.T. work?

Mrs E: We work and plan as a team and we discuss what we are going to do firstly as a yearly plan and then as a weekly plan. As we are planning for the whole curriculum we also include work with I.T., we discuss the programs that are going to be applicable, how we are going to use these programs and how to integrate them into the curriculum. I think as there are three of us working together that is a great bonus.

Mr Mc: With a vertically grouped class of Years 5/6 the spread of ability is going to be enormous. With word processing, for example, an activity that most teachers will be doing, we are using a variety of packages. There is a very simple one for the less able children and that particular package will read aloud to them the words they have written. This provides them with a great deal of amusement but it also gives them the extra interest and confidence to progress further. With the older and more able children, and the ones about to go to secondary school, we will be using a more sophisticated package where they can move text, cut and paste. They are beginning to use simple desktop publishing packages.

Where do you see I.T. as being of real benefit to your children?

Mrs E: Special educational needs! I think this is where I.T. really does come into its own, because it means children can be proud of their work. It is very important to children that they have work displayed and that the work on display is work they are proud of and that they feel is worthwhile. A child whose writing is very difficult to read and blotchy can produce a really beautifully presented piece of work on the computer.

Mr Mc: They are not afraid to make mistakes. It is usually the adults that are afraid but the children don't have that fear. They have enthusiasm and exuberance to go ahead and then they feed from each other. Every child needs varying levels of support and it is my role to support this through my classroom organisation.

How easily do children and staff take to I.T.?

Mr Mc: I.T. is an extra tool in the classroom that we might not have had previously. There is a great acceptance on behalf of the children to take the new technology in their stride. We have varying problems in involving members of staff and getting them confident in using I.T., and this is an issue we are very much aware of in our school. We are trying to address the needs of the staff but the children take it on quite readily. It offers a greater dimension to the children's learning – one that we would not normally be able to provide with pen and paper. You can see from the work they produce that the children have great pride in their work.

Have you had to change the way you teach in order to use I.T. in your classroom?

Mr Mc: The way I teach is still the same. I use individual methods, group or whole-class methods and I use the same styles with the computer. I don't think anything has vastly changed. The computer is part of the classroom. I.T. has helped me professionally in the work I have to do, both at home and at school, with producing things like worksheets. I purchased a second-hand Archimedes for use at home and I have found that the work I am able to produce for the children is of a higher quality so I feel much better about I.T. myself now.

Mrs E: I think we have changed as a school in that, when I made a video on progression and continuity throughout the school, we all worked together and thought about I.T. within the school. I think this helped us all to talk more openly and to see, in fact, how we were progressing. It focused our minds on I.T. within the whole school and we've built on that since then.

I have also used my knowledge to produce a new entrants' booklet with graphics, using the computer skills which I didn't have before. I have done another booklet on playground games. I think as an infants team we have progressed tremendously. Through gaining more confidence we have learned to use far more programs and we have given I.T. a much higher profile throughout the whole of the infants' school.

What are your future plans for using I.T. within your school?

Mr Mc: We have invested quite heavily in a rolling programme of INSET, which was our main priority. We have also integrated that into the school development plan and this is probably something we might not have done before. We have identified areas that we need to develop within the school, e.g. the control technology, and by finding in-service courses we hope there will be a greater use of control technology within the school.

The other thing we are trying to do is involve parents more. Whereas before there might not have been so many parents involved in our I.T. developments, the staff now have greater confidence to talk to parents about it. There is a great deal of interest from our parents and many are getting actively involved in using I.T. with their children.

What to look for

When you are preparing for your first school experiences I.T. is just one of the things you will have to think about. This sheet is intended to help you make the most of your time in school by highlighting some of the key issues surrounding use of I.T. in the classroom.

Factors indicating successful integration of I.T.

- ***Schemes of work include appropriate I.T. activities; the I.T. work should be closely linked with the other tasks.***
  For example, in *Starting from Stories,* when exploring the castle on an overlay keyboard children are prompted to carry out a number of investigations and measuring activities away from the computer.

- ***Children know why they are using I.T. and can talk about what the I.T. is contributing to their work.***
  Year 6 pupil: "I prefer using the computer because in a book it's all set down; you can move things around with a computer."

- ***Learners look critically at the outcomes; for example, they assess whether their findings from information handling or data capture tasks are realistic.***
  A sound sensor left in a classroom overnight produced an unexpected large peak in the graph; the children needed to establish what caused this.

- ***Children are aware of both the potential and the limitations of the technology they are using.***
  Using a CD-ROM can help children to find large amounts of information but they need strategies and skills to make the best use of the results.

- ***Enough time is available with the software for children to achieve worthwhile results.***
  If children need lots of time for entering data, it is important to give them time to explore and analyse it as well.

- ***I.T.-based activities are appropriate for the learners.***
  Different children may need different programs or ways of using them; some children may benefit from a wordbank or overlay keyboard to support their word processing.

- ***Children have the opportunity to make informed choices about the best tools for each task; they need to learn when I.T. is appropriate.***
  They may want to use a word processor when their work is to be read by others or go on display.

- ***Teachers assess and respond to children's developing I.T. skills alongside their subject skills.***
  Children can show an increased understanding of graphical ways of showing information when using data loggers to record temperatures or light levels and produce 'realtime' graphs.

To ensure that your classroom experiences are successful you will need to gather some information from a range of people involved with the school.

Who should I talk to?

Your school tutor/mentor

A senior manager

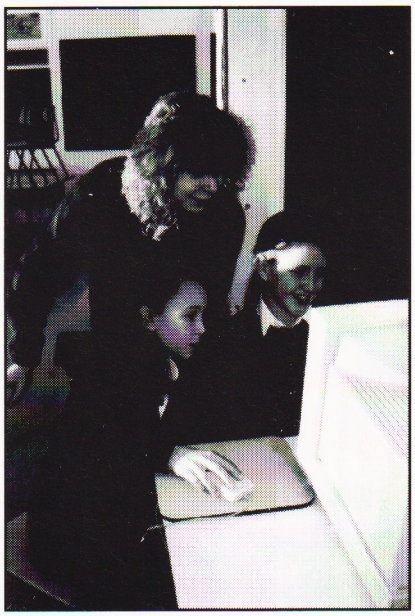
The I.T. co-ordinator

Teacher with responsibility for resources

Classroom teachers

Pupils

Parents



What do I need to know?

Does the school have an I.T. policy? Is it available for me?

How does I.T. fit into the scheme of work for the class(es) I am going to work with?

What resources are available for me to use (software, hardware, overlay keyboards, Roamers, turtles, sensors, printers)?

How does the school manage children's I.T. work (class discs, individual discs, back-up copies, print-outs...)?

How does the school manage the recording of children's progress in I.T. capability?

How do I arrange access to computer resources for my own use and for classroom use?

What do the children know and use already? (Don't forget about home users.)

How does the class teacher usually manage and organise computer use? What help is available in school?

What other sources of help might be useful to me? (Are there parent helpers with I.T. skills?)

Whether you're observing someone else's lesson, being observed yourself or assessing your own classroom performance the same set of criteria will apply for the successful use of I.T. These two pages are adapted from Inspecting I.T.: materials to support the inspection of information technology in schools. *They were developed by NCET and NAACE (National Association of Advisers in Computer Education) to support OFSTED inspection teams with the information technology content of lessons.*

Lesson Observation

- ***Content of lesson***
  Include reference to software and hardware resources used

- ***Standards of achievement***
  Standards should be judged against National Curriculum requirements
  Pupils' attainment and the strand(s) covered should be noted.

- ***Quality of learning***
  Pupils making gains in:
  – I.T. capability
  – subject knowledge, skills and understanding
  – competence as learners:
    literacy and numeracy
    posing questions and solving problems
    organising and evaluating
    observing and infomration seeking
    analysing and discriminating
    interpreting, synthesising and reconstructing
    communicating

  Pupils working:
  – independently or collaboratively, as appropriate
  – confidently, with perseverance and concentration
  – with commitment and enthusiasm

- ***Quality of teaching***
  Lesson planning
  – I.T. supporting lesson objectives
  – I.T. integral to the learning activity
  – Activity building on previous I.T. experience
  – Access provided to appropriate range of resources

  Lesson content
  – Matching school plan for I.T. delivery
  – fulfilling the National Curriculum requirements

  Delivery
  – Teacher competence in use of I.T. resources
  – Realistic expectations with sufficient challenge
  – Active engagement of all pupils
  – Differentiation and pace
  – Sensitive intervention
  – Pupils' I.T. work assessed and recorded

Contribution to achievements in other areas

- ***Does the use of I.T.***
  – enable higher levels of attainment?
  – restrict potential attainment?

Discussion with teachers can assist judgements about:

- today's lesson being typical in I.T. terms
- the balance between I.T. capability and I.T. to support the subject
- the teacher's contribution to the assessment of I.T.
- the teacher's contribution to the school's I.T. policy
- I.T. helping to meet the individual learning needs of pupils
- factors which enhance or inhibit the work of the teacher:
  - School management and co-ordination
  - Training (appropriateness of the teacher's own skills)
  - Technical back-up
  - Reliability of resources
  - Availability and appropriateness of software and/or hardware
  - Accommodation

Talking with pupils can assist judgements about:

- enjoyment of I.T., pupil collaboration and co-operation, confidence and ability to work autonomously
- effectiveness of their use of I.T. – in I.T. terms as well as in terms of subject achievements
- Access to I.T.:
  - How typical?
  - How often?
  - In this subject?
  - In this classroom (as opposed to library or computer room)?
  - Who chooses to use I.T. (and what software/hardware) – pupil or teacher?
- Pleasures and frustrations
  - Enough time
  - Hardware and software availability and reliability
  - Availability of technical advice
  - Whether pupils evaluate their work and make realistic judgements

Looking at pupils' work can show:

- progression and consolidation
- pupils' ability to reflect on their use of I.T. (by making notes and annotations about their successes and failures)
- standards of achievement in I.T. capability
- how I.T. has enhanced the subject
- I.T. balance within and between strands.

10 Tips for QualITy

I.T. CAN...

Help you to be better informed

To support your research, vast amounts of information can be accessed using a computer and a CD-ROM, which is a compact disc holding masses of information – text, sound and pictures. In addition, information from on-line databases can be accessed, saved to a file or printed out via a computer and modem – all for the cost of a telephone call. Beware, however, that information from these sources is not always up to date.

- ***Did you know that you can get collections of newspapers on CD-ROM now?***

Save you time

For school-based work, using I.T. to plan and create worksheets which can be easily changed and edited will reduce the amount of time you need to spend on preparation. Setting up a database of information relating to students in your groups will allow the easy production of class lists.

- ***Did you know that there are programs available which combine word processing, desktop publishing, database and spreadsheet facilities?***

Help you to support differentiation

Since using I.T. allows the easy creation and editing of handouts and worksheets, it is easy to adapt them to suit the individual needs of learners. They can be produced in a similar style so that they look and feel the same, but some might be printed in a larger font, use symbols or simplified language to explain a particular task, provide suggestions for extension work or contain technical help for managing hardware and software applications.

- ***Did you know that there is a mass of cheap computer graphics – 'clip art' – available to help you enhance your materials?***

Improve your image

I.T. allows the easy creation, editing and printing of text and graphics and it is therefore ideal for preparing and easily updating your assignments, teaching materials – or Curriculum Vitae. The ease with which borders, logos and graphs can be incorporated also makes the preparation of professional-looking documents a relatively simple task.

- ***Did you know that with many printers you can print directly onto overhead transparencies – colour too?***

Improve your efficiency

An electronic organiser would hold personal timetable information, details of your family and friends and the alarm would remind you of things you need to do. A portable computer could be used to take notes in lectures and in the library to enable you to get started with assignments.

- ***Did you know that you can make phone calls direct from the address lists?***

Improve the image of your institution

I.T. allows text, pictures and graphics to be easily changed and combined to produce high-quality, professional-looking print-outs. These can be effectively used to produce an institutional brochure, corporate logos, publicity handouts and fliers, advertising posters for forthcoming events, programmes for open days, plays, sports fixtures . . . This is becoming increasingly important to schools and colleges.

- ***Did you know that you can use the computer linked to a sewing machine, lathe or loom to create your own badges or shields?***

Support your creativity

I.T. can offer interesting ways to present work. For example, images can be copied into a computer by using a scanner or a digital still or video camera and be incorporated into reports and assignments. Software packages which allow the production of multimedia presentations can be used to present work, or to provide a continuous 'slide show'.

- ***Did you know that some schools have produced multimedia – and multilingual – displays for their local tourist office?***

Help you cut down on repetitive tasks

I.T. is excellent for taking the drudgery out of boring or repetitive tasks. For example, building up templates for frequently sent letters and a database for addresses will allow a 'mail shot' to be quickly and easily achieved. (The computer inserts names and addresses into a standard letter . . . you still have to lick the stamps, though!)

Setting up formulae within a spreadsheet will allow automatic calculations to be undertaken to produce totals or averages of figures. In addition, graphs, tables and charts can be easily produced from data in databases or spreadsheets.

- ***Did you know that you can do a computerised tax return?***

Help you manage money better

Spreadsheets can be set up to help you monitor and manage your finances – even your Bank Manager would be impressed! Formulae can be placed within the spreadsheet allowing you to test out what effect certain changes might have on a situation, for example, how increasing prices might affect your solvency.

- ***Did you know that you can include all sorts of things in spreadsheets – pictures and even voice messages?***

Help you bring your teaching to life

I.T. is interesting and motivating for most students and its use will help you to enhance your teaching and learning. Through the use of computer simulations such as managing a nuclear power plant, students can experience situations which would be too costly or dangerous in real life. Software applications also allow the modelling of events like sales over a period of time to see the effect of price increases on the sales of certain products. Also, by providing students with access to devices like CD-ROM or CD-Interactive, you can enable them to take a greater responsibility for their own learning and encourage them to pose and test hypotheses.

- ***Did you know that you can tour Paris on CD-ROM (in French or English), plan a vacation in the National Parks of North America or go on a dinosaur safari?***

Ten Tips for Assessment

1. ***Plan for IT assessment when you plan other aspects of your work***
Ideally an IT assessment task should be nothing more than an activity within a curriculum topic which involves the use of IT as a natural part of the task, and where a note is made of achievements in IT.

2. ***Consider what aspects of IT you want to assess***
IT is usually better assessed within a curriculum context and this may enable you to make a subject assessment at the same time. Assessment of the applications and effects of using IT only really makes sense if done within a curriculum context.

3. ***Ensure that software allows users to demonstrate their IT capability***
Often individuals are prevented from showing their true ability because the software does not allow higher levels of IT capability to be demonstrated.

4. ***Assessment during group work is easier if group members have similar abilities/experiences***
Time may be wasted by group members having the explain to less capable or inexperienced individuals within the group what they have to do and how to carry out the task. This may cause frustration and prevent the group from completing the set task.

5. ***Check that other groups have all they need to continue their work without needing your attention***
Make sure that all the materials, equipment etc. are available so that you can concentrate on the group or individual you are assessing. If possible, have another adult or competent student available to answer any queries or deal with problems as they arise.

6. ***Watch a group working and note who contributes to discussions***
If one particular individual is dominating the conversation, you may wish to intervene and ask the others to offer their thoughts, ideas or opinions. If, however, the group are talking and discussing ideas easily, you should make no attempt to stop them. If it is not possible for you to sit with a group, leaving a tape recorder running may also provide you with an insight into who contributes what to group discussion.

7. ***Collect printouts and notes arising from the activity and add the date and a short description of the task***
Putting the evidence into context is very important as weeks or months later it is easy to forget what the groups were working on. It is also important to remember that, where the printouts have been produced as a group effort, they alone cannot be used to indicate an individual's IT capability.

8. ***Spend a few minutes talking to individuals to establish what they understood about the task***
You might ask questions such as:
- How did the group decide on what they needed to do?
- Did everyone have chance to say what they thought?
- How did you manage to save your work? Why is it important to save it?
- Can you think of any other way you might have completed the task which wouldn't involve using a computer?

9. ***Use individuals' responses and your notes to help you decide on their level of achievement in IT capability***
Any assessment you make should be formative and can be supported by discussions and observations which you have carried out during lessons. Learn to trust your own professional judgement.

10. ***Give regular opportunities for individuals to demonstrate, and reflect on, their IT capability***
It is important that any individual who is displaying a level of capability above or below your expectations should be given other opportunities to demonstrate what she is capable of achieving. This is particularly important when the assessment has been carried out early in the academic year.

Don't Panic!
(the micro doesn't appear to be working)

Roger Keeling
Newman College

If we were to list all the ways in which different micros can fail it would probably take up the whole of this publication. Fortunately things don't go drastically wrong too often – witness the number of BBC machines still in use! However there are one or two simple steps you can take to try and identify the fault.

Suspected hardware fault

This is made easier to diagnose by the fact that when a system goes wrong most schools have a second system of the same type to experiment against. The basic premise is to alter one variable at a time. Hence if the micro appears not to be working:

a) check that it is plugged in at the wall socket – remember that the disc drive and monitor may have their own wall sockets (and on/off switches);
b) check that the power supply to the micro, monitor and disc drive are all switched on (this particularly applies to the older BBC machines);
c) check that the micro is switched on at the side/back of the machine;
d) check that all the appropriate leads are plugged in and are firmly 'seated' – if, by moving a lead, it causes an inconsistent response (the screen flickers or a light flashes), then there is probably a fault in the lead/connectors;
e) check that the disc drive door is fastened (if appropriate).

If all of these tests have been performed satisfactorily, something more serious may be at fault. Try checking the fuses in the three pin plugs (all of them) and the fuse in the micro itself (only if you know where it is). Now at this point the second micro comes into play – but check that it is working before starting.

Systematically start to replace components on the working system with components from the faulty system.

a) where possible, swap power leads, monitor leads, printer leads;
b) swap the monitors over;
c) swap the keyboards, mouse or disc drives.

If the second system still works after all these components have been fitted, then the error must lie with the micro itself. For example, the power supply might have failed or a hairline crack developed in a circuit board. The solution is probably a 'return to base' repair – check with your LEA or independent Computer Centre to see what facilities they have for repairing machines. Provide as much information as possible as to the cause or symptoms of the problem and keep a record of all the correspondence/transactions.

Software problems

These are identifiable by the fact that all the hardware appears to be working (including the disc drive trying to read the disc) but the software doesn't load satisfactorily. Once again try to load the software on the second system. If it works on the second system, what are the differences between the two machines? Has the one more internal memory; has it a different disc drive? In the case of the BBC micro, is the drive switched to the right setting (40 track or 80 track)? In the case of double drive machines, have you inserted the disc in the correct drive? In the case of hard disc machines, is the micro trying to read the hard disc instead of your floppy disc? If you still can't get the software to function you could phone the software publisher – most provide a telephone support service.

Printer problems

These are thorny problems to solve. Every piece of software needs a printer driver (an extra piece of software) to enable the program to 'talk' to the particular printer you are using. In some cases this software is 'invisible' as it is built into the program. The problem is compounded by the fact that most printers have 'dip' switches that allow you to configure them in different ways. How is the software meant to know which way you have set the switches? Given the number of variables involved it is a miracle that any printer works! The basic rule is to save your work before trying to print it out. At least it can then be redisplayed on the screen. You are also able to take the file to other machines to see whether a printout can be achieved from other machines. If it can, then make a note of the successful combination and don't waste any more time on the problem – you're not paid to be a technician. For example, stick a label on the micro to the effect that *this* system will always give a reliable printout from *Caxton Press*. In general, all you can do is to experiment with different printer drivers if you have them. In particular, when you buy new printers check beforehand that the programs you want to use will work with the printer you are intending to buy – once again your Computer Centre should be able to advise you.

Multimedia

Using and making multimedia

Multimedia applications allow users to create computer files which combine text, sound and pictures. Available on CD-ROM and IV (Interactive Video), they provide a very rich resource for both pupils and teachers to use.

Multimedia titles can combine resources for immediate use and reference with tools which allow the user to adapt these into interactive presentations.

The *British Birds* CD-ROM, for example, was produced for the Archimedes and the PC in association with the Royal Society for the Protection of Birds and the British Library. The disc contains thousands of full-colour images of British birds, motion video sequences, bird calls and songs, a map facility for analysis of geographical factors, and a quiz.

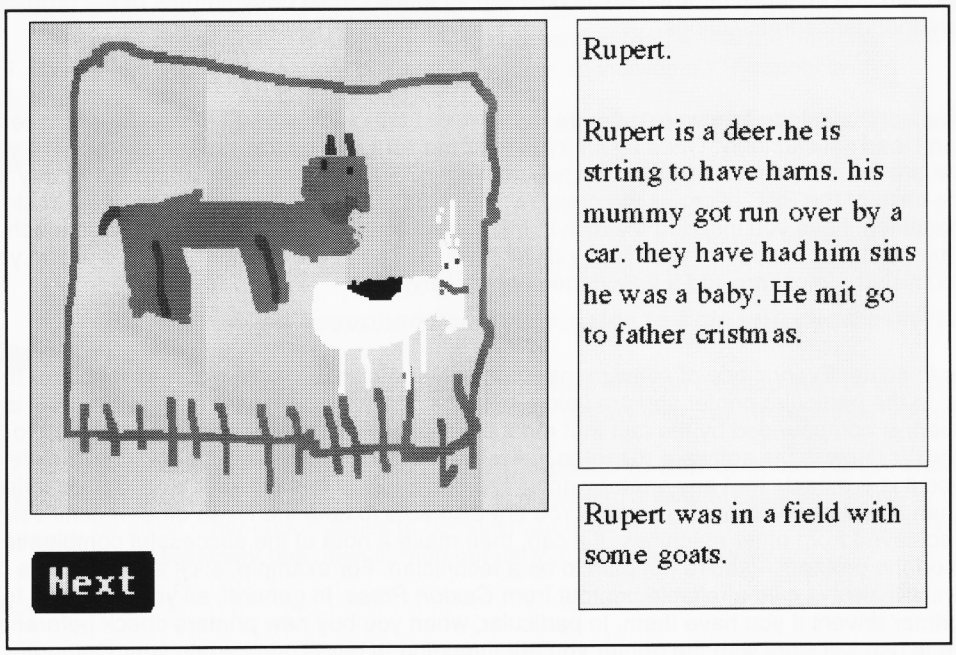
It also displays these resources together with options for capturing text, sound files and images, and saving these in a scrapbook. Users can then add their own text and arrange the pictures in any order. The work can then be saved on a floppy disc and accessed by any other user who has a CD-ROM. In this way customised applications can be distributed and shared amongst users.

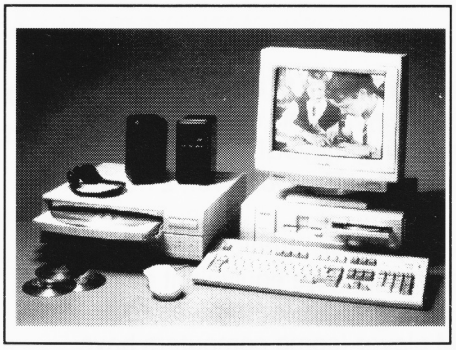
Making multimedia

There are now increasing opportunities for teachers and pupils to make multimedia applications themselves.

The Reception class at Petersgate School, for example, used the Genesis authoring package in order to document their trip to a dairy farm. Their illustrated essay incorporated photographs which they took themselves with an Ion camera, with graphics and text captions also created by the pupils.

This and other applications from Hampshire's Horizon Project are being documented and will be stored and distributed on CD-ROM and floppy disc. The aim of this project is to offer the outside world a vision of what is happening in schools, together with a collection of resources for pupils to use themselves and a collection of interactive learning resources linked to the curriculum.





Interactive Video

Combines sound and pictures from a LaserDisc with text, graphics, audio and data from a computer. LasterDisc offers up to 55,000 single frames, or some 30 minutes of video, on each side of the 30cm/12" disc; still and moving pictures, mono or stereo audio, and computer text and images can be presented in virtually any combination.

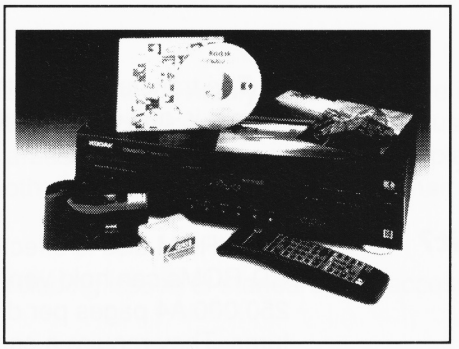
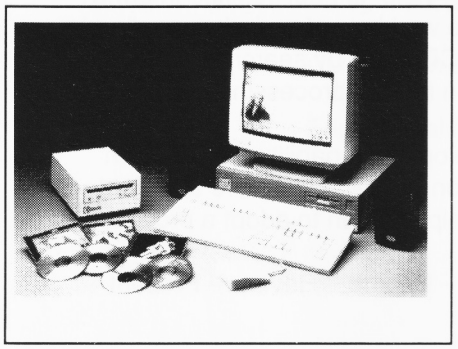


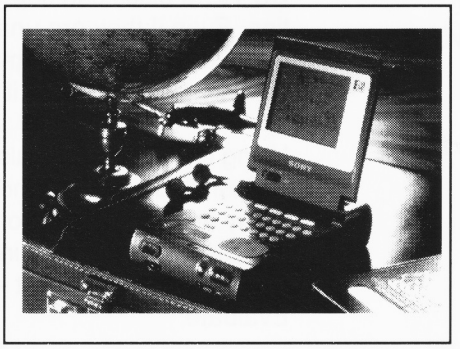
Photo CD

This is to pictures what audio CD is to sound: compact medium for high-quality recordings. Up to 100 images (at quality levels up to eight times greater than broadcast television) can be stored on one recordable disc. Photo CD is compatible with other CD platforms, and the images can be displayed on a TV or used in multimedia and desktop publishing.



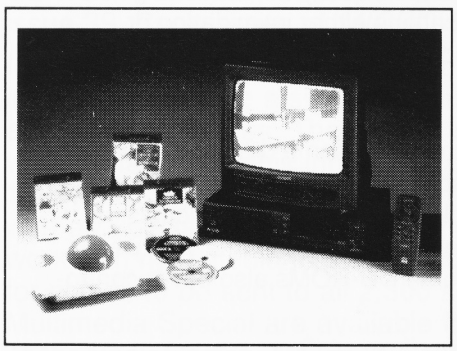
CD-ROM

Offers up to 650MB of data – some 250,000 pages or 1500 floppy discs – on a single-sided 12cm/4.75" disc, under the control of a computer. The CD-ROM drive can be connected to the computer (as above) or built in to it. As well as text and data, CD-ROM has limited facilities for graphics, audio and animation.



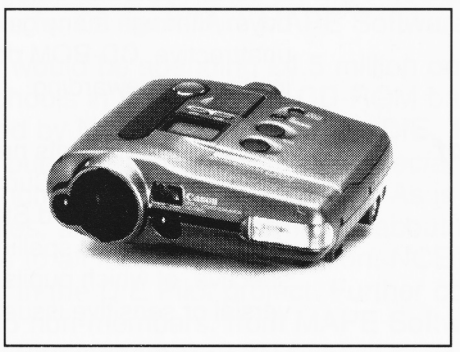
Data Discman

An electronic book which puts the features of CD-ROM into a hand-held player with its own screen (typically, about ten lines of 30 characters each) and keyboard. The unit can be used for ready reference on its own, or connected to a larger screen and/or computer. Other hand-held units include portable CD-ROM and CD-I systems.



CD-I

CD-I (above) and CDTV are primarily consumer entertainment products, which combine video, graphics, audio, text and data on a single-sided 12cm/4.75" disc. The player connects to an ordinary television, under the control of the 'thumbstick' remote control or jollier Roller Controller. CD-I and CDTV offer a range of reference and entertainment titles on disc.



Still video (SV) cameras

Such as the Canon Ion range (above) or Logitech Fotoman, capture photographic images for display on an ordinary TV monitor, or transfer to a computer. Still pictures from these digital cameras can be incorporated directly into multimedia presentations and other applications, such as desktop publishing (DTP).

CD-ROM for Education

> The transference of the great *Oxford English Dictionary* to a metallic beer mat is one of the major technological achievements of this century.
>
> Anthony Burgess, reviewing the OED on CD-ROM, *The Observer*, 21/6/92

What is it?

A CD-ROM disc is effectively an audio CD adapted for electronic publishing. CD-ROMs can hold very large quantities of information (the equivalent of 250,000 A4 pages per disc), as text, pictures, sound – and even moving pictures. They require a computer and a CD-ROM player (some computers have built-in CD-ROM drives), and one of their strongest features is the ability to retrieve information quickly.

An increasing range of CD-ROMs is becoming available, for educational and business use and for entertainment. The educational discs suit all phases and a number of curriculum areas and include dictionaries, encyclopedias, newspapers, atlases, databases and talking books.

Why use CD-ROM?

CD-ROM discs can support curriculum work by helping pupils to find information. Even if they are unable to understand the workings of an index, pupils can retrieve information from an encyclopedia on CD-ROM by searching for keywords – and then print it out or incorporate it in a word-processing program.

Using a CD-ROM will also help pupils to develop I.T. capability, and to learn skills in information handling. These information-handling skills are applicable to many areas of the National Curriculum and help children to adopt a process, wherever they are looking for information:
Decide – Look – Select – Retrieve – Process – Record – Review – Present – Evaluate.

The advantages of CD-ROM

CD-ROM has many advantages over printed material: it is easy to use, and its use of icons makes it intuitive. It is also highly motivational – pupils are more likely to read information sources such as *The Times*, for example, if it is on CD-ROM disc. The ability to access multiple sources of information (encyclopedias, atlases and databases, for example) enables pupils to incorporate text and pictures into their work, and, if combined with a word processor, helps them to produce a professional-looking document.

Another feature of CD-ROM is that it appears to be equally attractive to girls as boys. Although many girls find some I.T. applications either intimidating or unattractive, CD-ROM does not have this effect – on the contrary, they find it inviting and rewarding.

A word of caution

Teachers and parents need to be aware that there are some drawbacks with CD-ROM, however. Currently, many of the discs available in the UK are manufactured in the United States, and consequently contain many Americanisms and Americanised spellings. They are also likely to contain an American perspective, of which pupils need to be aware. Some CD-ROMs also cover controversial or sensitive issues.

On a practical note, it is easy for pupils to become 'lost' in a CD-ROM and fail to discover the information they want. It is also easy to become sidetracked whilst using a CD-ROM. Pupils (and teachers too) need to learn strategies for information retrieval, so that the benefits of CD-ROM are not lost.

Questions for the future

The increased use of CD-ROM in schools will inevitably mean a change in learning – and teaching – styles. Research continues into the effect of using CD-ROM in a range of curriculum areas, and into where the CD-ROM player is best located so that pupils use it both easily and naturally as part of their research.

Technical questions also remain, including issues of standardising access and making navigation easier.

For more information

CD-ROM in schools scheme: evaluation report, NCET

Finding the words: dictionaries on CD-ROM, NCET

Seek and you will find...fast! encyclopedias on CD-ROM, NCET

Using the news: newspapers on CD-ROM, NCET

Using the ECCTIS CD-ROM, NCET

CD-ROM in education: the ITE scheme, NCET

Educational computing magazines

Editor's note:

As regular readers of *MICRO-SCOPE* will know, MAPE has been active in promoting the case for CD-ROM in primary education and has included a regular feature, *Focus on Multimedia*, since issue 39. Back issues of *MICRO-SCOPE* are available for £2 each from MAPE Software.

In February 1994, Eric Forth announced that the DfE would be spending £4.5 million on an initiative to provide a significant number of primary schools in England with CD-ROM based equipment and titles. The project is being administered by NCET on behalf of the DfE. To coincide with the launch of this innovative pilot project, MAPE published *The Multimedia Special* in June 1994, with sponsorship from Acorn Computers and Thomas Nelson and Sons Ltd. As is the case with all Specials, this 48-page collection of case studies, articles and information about current work with multimedia in primary schools was sent free to all members. In addition, NCET arranged for copies to be sent to all 2,300 schools participating in the DfE Pilot project. Further copies of the Multimedia Special are available for £3 (members), £5 non-members, from MAPE Software, Technology Centre, Newman College, Bartley Green, Birmingham B32 3NT.

Portable Computers in Education

What are they?

Portables come in a variety of sizes:
- laptops, which are typewriter size and can be quite heavy
- notebooks, which are either A4 or A5, and have a 'clam-shell' design
- palmtops, which are hand-held and also clam-shell design
- low-cost word processors, which are A4 and have screen and keys set in the top surface
- PDAs – Personalised Digital Assistants, which often have stylus input (these are not common in education yet).

Why use portable computers?

Portables are currently outselling desktop computers in the business sector: their portability makes them ideal for working in the office, on site, and at home. In schools too, portables are becoming increasingly popular, since their lower cost makes them more attractive than desktop models. Many less confident computer users find them less daunting to learn to use than a desktop model.

What can they do?

The A4 and A5 notebook computers can offer most of the facilities of a desktop. Portable computers are becoming increasingly sophisticated, and many can be connected to networks or stand-alone machines, to enable information transfer. Many palmtops have useful diary and organiser functions built in, and even the small models can offer communications facilities (electronic mail, for example).

Why use them in school?

In school, portable computers offer many advantages over stand-alone machines. Because they are portable, they can travel with pupils from lesson to lesson, or room to room, and they obviate the necessity to book a computer room. In the classroom, they take up less space than desktop machines and can sit alongside other resources.

Their portability means that they are particularly suitable for fieldwork and visits – pupils often find it easier to write on site using a portable computer rather than back in the classroom after some time has lapsed.

Pupils using a portable computer and sound sensor to measure traffic noise

If pupils are allocated their own personal portable computer, they can obviously enjoy the benefit of using the same facility at home as at school. Parents are generally very supportive of their children's use of technology even when they may not be able to use it themselves.

If portable computers are purchased in sufficient numbers, groups of pupils or even whole classes, can have simultaneous access to information technology. Because of their size, portables are also easier to store safely in school.

What to buy?

To buy wisely, you need firstly to establish the likely pattern of use. How portable do you need the machine to be? Do you need a word processor only, or would spreadsheet or communication facilities be useful too? Which would be more useful to the school: one portable in every classroom, or a set of portables in one classroom? You also need to consider which areas of the curriculum you are likely to use portables in – some areas are much more appropriate than others.

It is important to think about compatibility too. Will it be more useful to have a portable which is compatible with existing equipment or software than one which may possess a variety of features but which cannot be used easily in conjunction with anything else?

Disadvantages

Although the problem has lessened in recent years, battery operation is still a crucial issue in the use of portables. Using a mains connector will prolong battery life, but obviously reduces the portability of a machine. When pupils make regular use of portables, schools usually need to set up a system of battery recharging and maintenance so that machines do not give out mid-lesson and important work is not lost. Shared machines also need careful file management procedures.

Beware also that the small screen size of many portables means that they may have limited use for group work. Small keyboards can be a problem too, and the very portability of machines makes them vulnerable to damage in transit.

Issues for the future

A growing number of parents are purchasing portable computers for their children to use both at home and at school. There are management issues for schools when large numbers of portables are used, whether they are owned by the school or by the pupils.

Increased access to portables is likely to affect teaching and learning styles, and is likely to impinge on exam board acceptance of files in the future. Classroom management issues are also likely to arise as larger numbers of portables are used in class, as will issues relating to access to communications facilities such as remote databases.

For information

Choosing and using portable computers, NCET, 1992
Pupils' learning and access to I.T.: an evaluation, Queen's University, Belfast
Which? Report, October 1993
DfE Portables Project Evaluation, NCET (forthcoming)

The Verdict

"It is giving pupils the 'right start' we wish all children to experience".

"The children have even been using their portable computers under the bedcovers by torchlight when they should be fast asleep!" (Headteacher)

"We want to take ours to France with us," (Class teacher)

"We should all have one!" (Pupil librarian)

The Teddy Bears' Literary Bonanza

Making sense of the jargon

Adventure game A program which usually involves the user in taking the role of a character in a story. Often there is a search or quest involved which necessitates the user in solving clues or puzzles and also in collecting objects to allow progress onto the next part of the adventure. *See also Model, Simulation.*

CD-ROM (Compact Disc Read-Only Memory) Like an ordinary CD but can contain *text* and *graphics* as well as sound. The discs can be accessed using a computer. *See also CDI.*

CDI (Compact Disc Interactive) A machine which allows the user to access a *CD-ROM* without needing a separate computer system.

Computer program A set of precise instructions to make a computer perform a particular task.

Computer system A collection of *hardware* which usually consists of a computer, a monitor, a disc drive and a printer.

Concept Keyboard A particular make of *Overlay Keyboard.*

Control interface A box which has a number of output and input sockets and plugs into a computer. Lights, buzzers and motors are plugged into the output sockets and can be turned on and off by a set of instructions defined by the user. These instructions may respond to environmental changes detected by *sensors* plugged into the input sockets. *See also Peripheral.*

Data Any set of information that has been collected for a purpose. *See also Database, Data file.*

Database A collection of information that is organised and stored for a purpose. In computer terms, a database is a program which will allow information to be entered, searched, retrieved and presented. *See also Data, Data file.*

Data file A collection of information which has been saved on disc and which can be read into a *database* program. *See also Data, Database.*

Data logging The use of *sensors* to measure and record environmental changes, for example the changes in temperature of water in a pond over the period of several hours.

Desktop publishing A computer application which allows the user to create page layouts which combine *text*, *graphics* and *images* with different sizes and styles of type.

Electronic mail (Email) This allows users to send and receive printed messages over any distance by using a *Modem* which connects their computers via a telephone line. The messages may contain *text* and/or *graphics.*

Floor turtle A programmable device, sometimes called a floor *robot*, controlled by *Logo* or Logo-like languages. The turtle has a pen holder which can be lifted or dropped to trace the turtle's movements on paper.

Graphics

Graphics are pictures or symbols on a computer screen which may be printed out or saved to disc. *See also Images*

Hardware

The physical components of the *computer system* and other *peripherals*.

Hypermedia

This is *software* which allows the user to combine still and moving *images*, sound, *text*, *graphics* and animation to be presented by a computer. *See also Multimedia.*

Images

Pictures which appear on the computer screen. They may be created by the user using an art package, scanned into the computer using a *peripheral* called a scanner, digitised using a peripheral called a *video digitiser* or accessed from an external device like a *CD-ROM. See also Graphics.*

Interactive video (IV)

A computer linked by computer software to a video system which allows the user to control a video disc and explore the information on that disc. Choices can be made about the order in which the exploration takes place.*See also CD-ROM, CDI.*

Keyboard overlay

A sheet that is placed over the touch-sensitive membrane of an *overlay keyboard*. The overlays can contain pictures, maps, diagrams, text or objects. Pressing on any part of the overlay causes a message relevant to that area to appear on the computer screen. The messages may already be defined in the *software*, or they may be defined by the user. Messages may be vocabulary, instructions, questions or information of varying complexity. *See also Concept Keyboard, Overlay keyboard.*

Keypad

A touch-sensitive pad which has letters, numbers or symbols on it. With the keypad, the user can give instructions to devices such as *programmable toys*, floor *robots*, washing machines and microwave ovens.

Laptops

Laptop or 'Notebook' computers are powered by rechargeable batteries and are small enough and light enough to be carried around. They usually have a *QWERTY keyboard*, a fold-up screen and built-in disc drive or hard disc. Some laptop computers can only be used as a *word processor.*

Logo

Logo is a programming language. The name comes from the Greek 'logos', meaning word. It allows the user to give instructions to a computer in words and numbers rather than codes. In its simplest form (*turtle graphics*) it allows the user to control the movements of a *screen turtle. See also Floor turtle, Screen image, Screen turtle.*

Model

A representation of a real or imagined situation governed by certain rules which are managed by a computer program. The rules or *data* can be changed by the user and the outcome of the changes can be viewed on the computer screen. *See also Adventure Game, Simulation.*

Modem

A Modem converts computer information into a form which can be transmitted via a telephone line and vice versa. *See also Electronic mail.*

Mouse

A *peripheral* which may be attached to the computer and is used as a tool for pointing to objects on the screen, for accessing menus within software packages or for highlighting and moving *text* or other objects around the screen. *See also Peripheral.*

Multimedia A combination of *hardware* which accesses moving *images, graphics, text* and sound controlled by a computer. *See also Hypermedia.*

On-line database A remote *database* which can be accessed using a *Modem* via a telephone line. *See also Data, Database, Data file.*

Overlay keyboard A flat, touch-sensitive surface on which paper overlays containing words, pictures or objects can be placed. The keyboard is used as a replacement or accompaniment to the conventional keyboard. *See also QWERTY keyboard, Concept Keyboard.*

Peripheral A device which can be plugged into the computer to perform some additional function, for example, a disc drive, a printer or an *overlay keyboard.*

Programmable toys Toys which will obey a sequence of stored instructions entered by the user through a *keypad. See also Floor turtle.*

Programming language An artificial language constructed to enable the user to communicate with a computer. The most common programming languages used in schools are *Logo* and BASIC.

QWERTY keyboard A computer keyboard with keys laid out in the same order as a traditional typewriter. (The first six keys in the top left-hand corner spell QWERTY.) *See also Overlay keyboard.*

Satellite TV A satellite can be used to relay *telecommunications* and TV broadcasts throughout the world. In order to receive programmes you need a satellite dish, a satellite receiver and a television set.

Scanner A *peripheral* which reads across a paper image and produces a signal which can be interpreted by a computer program to reproduce that image on the computer screen.

Screen turtle A representation of the *floor turtle* but shown on a computer screen. The screen turtle can be shaped like an arrow head, a turtle or other user-defined shape. Referred to in the *Technology in the National Curriculum* document as a 'screen image'. *See also Floor turtle, Logo.*

Sensor A device used to measure environmental changes such as light, temperature and movement. Sensors may be connected to control interfaces or *data-logging* devices. *See also Control Interface, Control systems.*

Simulation A pre-defined computer *model* of a situation which may allow the user to try different strategies and see what happens as a result. *See also Adventure game, Model.*

Software A computer prog[illegible]

Spreadsheet

A computer program which allows *text* and figures to be entered into cells on a grid format. Cells can be linked by formulae so that altering numbers in individual cells will produce an alternative set of results. Spreadsheets may be used to *model* situations whose rules are governed by mathematical relationships, e.g. a numerical series such as Fibonacci or the management of a budget account.

Telecommunications

A system which uses telephone lines, cables or satellite signals to transmit and receive *images*, sounds and *text*, for example, the transmission of a fax between two schools.

Text

Letters, words or sentences which may be entered by the user into the computer and can appear on the computer screen, be printed out or saved to disc. *See also Word processor, Text manipulation program, Teletext, Viewdata.*

Text manipulation program

A program which allows the user to decode scrambled messages or to systematically reveal hidden *text* which has been entered previously into the program.

Turtle graphics

Diagrams drawn by a *screen turtle* controlled using *Logo* or a Logo-like program. It is also called 'turtle geometry' since it allows the user to explore shape, space and angle of turn.

Video digitiser

A device which converts a video *image* into a form which can be stored and displayed on a computer screen.

Word processor

A program for computer-aided writing, editing, storage, revision and printing of *text*.

The Copyright Jungle: some questions answered

Janice Staines
Senior Programme Officer, NCET

I've been using a program in college and I now want to use it in school, is that okay?

Some institutions arrange with publishers a specially negotiated licence which allows students to take programs with them into school. You will need to check with your IT resources manager whether or not your institution has such an arrangement for the program you are interested in using. If they do not have this arrangement, then you must not take the program outside your institution. It would be better to check which programs the school has available for use and base your lesson planning around those programs.

I'm using a simulation program in school, and I want several groups to work on it at once. Is it okay to load it onto more than one computer?

You will have to check with the class teacher or the IT co-ordinator what sort of licence has been bought for this particular program. If it is a 'Single user' licence then you can only use the program on one computer at a time. However, the school may have paid extra for a 'Site' licence which allows the program to be run on all the computers within the school. Alternatively, if the school has a network of computers, then the program may be a 'Network' version which can be set up on the network server and accessed from any of the networked computers.

We are doing a group practice in school and several of us want to use the same program. Can we make our own copies of the documentation?

You do need to be careful as documentation is covered by copyright too. If your school has a 'Site' licence, or your institution has arranged a licence which allows you to take programs into school, then it is likely that several copies of the documentation will have been supplied with that licence. Check whether or not this is the case. If you cannot find multiple copies of the original documentation then it would be better to make your own short help sheets based on the documentation – you can then keep these by the machines to help the children too!

I've been using a program with the children in school. The class teacher really likes the look of the program and wants me to leave a copy of the disc with her – can I do this?

No matter how persuasive the class teacher is, you must *not* leave a copy with her; you will be in breach of copyright if you do. The only programs which can be freely copied for educational purposes are those which are clearly marked as 'Public Domain'. This means that the developers have given permission for their software to be used in this way. If she is really impressed with the program, leave her details of the title, publisher etc. and encourage her to buy her own copy!

I want to scan some pictures from a book about Tudors & Stuarts into the computer to include in some worksheets I am producing – am I allowed to?

Read the copyright notice which appears in the book. Some publishers will allow copying for educational use only, provided that no charge is to be made for the materials. If you are in any doubt having read the notice, DON'T! You could always ask a friend who is good at art to draw you a picture based on the original – it will be a lot safer.

The children I'm working with have started to use CD-ROM for gathering information. They want to save some of the pictures, video clips and audio tracks to use in their own work; are they allowed to do this?

At the moment, this varies from publisher to publisher. Some will allow the user to copy images, text etc. for educational purposes and they even make the video clips, images and sounds available as separate files on the CD-ROM – others do not. Check the copyright notice which accompanies the CD-ROM or, if you are in any doubt, check the position with the publisher before you allow them to copy anything.

I want to do some work with the children about 'Ourselves' but I've been put off because of what I've heard about having to register under the Data Protection Act. Is this true?

If you are setting up a computer database which contains what is considered as 'personal' information (e.g. addresses, telephone numbers, etc.) then you do need to be registered under the Act. However, this is the sort of information that the school undoubtedly keeps in computer format anyway, and it is probably already registered. . . . You will just need to check before you go ahead with your project.

I'm doing some work with the children on the local environment and want them to take photos, possibly with an ion camera, for use back in school. Do I have to get permission from the shopkeepers, householders, etc.?

It is always a good idea to ask permission before taking photographs in the local area. Certainly taking photographs of things like shop fronts, homes etc. can be considered an invasion of privacy. If you don't want to upset the neighbours, ask first!

I want to include photographs of some children I've been working with in my teaching practice file. Do I need to get permission to do this?

You should always seek permission from the headteacher before taking photographs of the children and ask if you should also seek permission from the parents.

MAPE Conference 1994:
A students' eye view

Michelle Johnson and Gill Smith
2nd Year B.Ed. Students, Newman College

Editor's introduction

MAPE holds a three-day annual conference. This usually takes place during the weekend before Easter and is held in a different part of the country each year. Recent locations have included Nottingham, York, Bangor, Glasgow, Birmingham, Durham and Cheltenham. The 1995 conference will be held at the Bath College of Higher Education from 7–9 April.

The conference is always well attended by a rich mix of people with a wide range of experience and expertise but a common interest in IT in primary education. In preparation for this Special, MAPE commissioned two students, Michelle Johnson and Gill Smith from Newman College, to report on the Saturday of this year's conference in Nottingham, and equipped them with a Canon Ion camera to record their impressions. Here is their account of the conference:

A students' eye view

'What had we let ourselves in for?', we wondered, as we drove along the M42 on a sunny Saturday morning at 7.30 a.m. – so Nottingham's only an hour away from Birmingham!

When the car began to lose power I looked at Gill questioningly. Petrol? No, a full tank. It wasn't going any further! Two hours, one husband's arrival, and a reconnected loose wire later we trundled our way into Nottingham to arrive at the MAPE conference.

After a welcoming cup of coffee we were hailed by Maid Marion (alias Anne Farr) who introduced us to a band of merry men (and women). Next thing we were the proud 'owners' of a new Canon Ion camera and told to photograph the conference. So from Nigel Mansell to David Bailey we went on our wondering way.

'Accessing the Curriculum' was our first stop. Mick Thomas of NCET was entertaining and informative. He showed us tools to access the curriculum – talking calculators, portable word processors, speech synthesizers – which are all available for the classroom.

On meeting up with Maid Marion once again she whisked us off to a feast in the forest, in the shape of a delicious lunch. Having eaten a hearty meal we ventured forth to see Maureen Quigley, also of NCET, and listen to a talk on CD-ROM – the words on everyone's lips! We learned about the funding earmarked for schools (see page 27) and the lottery for the computers. Armed with this information we each went to our own schools to see if they had put in an application.

More photographs and another coffee break later we entered into the world of digitisers and ions. How to use an Ion camera to capture images and manipulate digitised images on Archimedes computers. Got it? We didn't! It wasn't quite what we needed as students embarking on integrating Information Technology into the curriculum, but we learn by our mistakes. In hindsight, a different seminar or lecture would have suited us but playing David Bailey all day had influenced our decision.

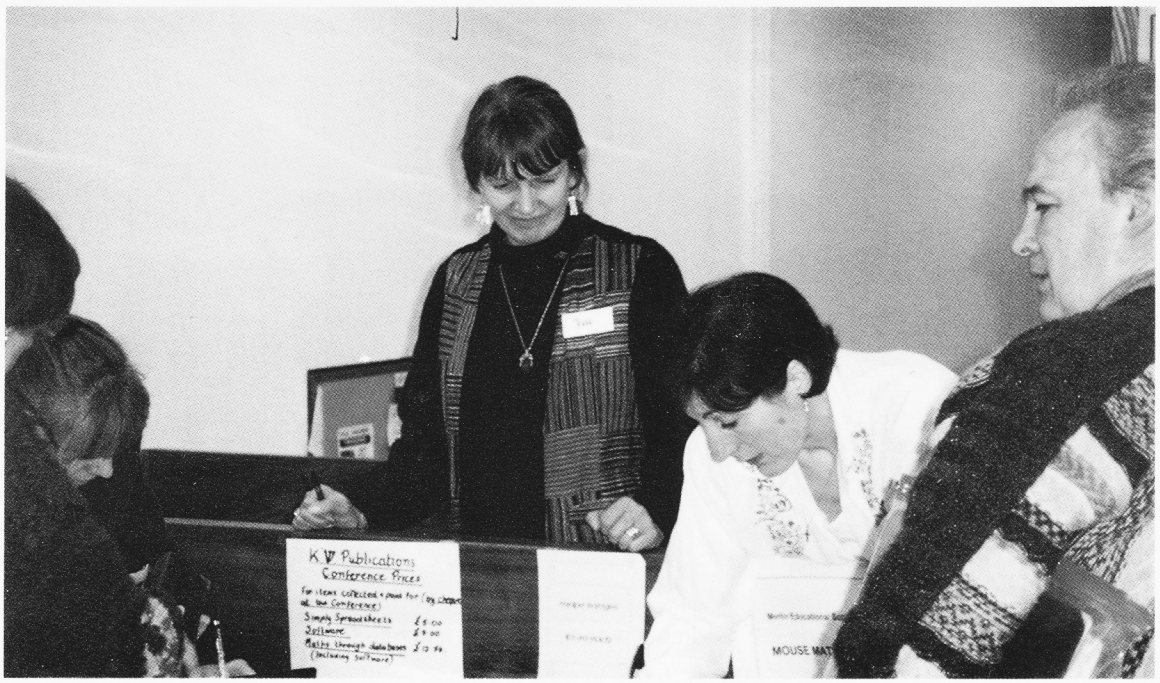
The whole conference was geared towards users of computers and those wishing to develop their expertise in using IT in the classroom. As students, the themes 'Managing IT in the Classroom', 'Cross Curricular Issues in IT' or 'Management Skills for IT Coordinators' would have been more

suited to our needs. Ideally a strand appropriate for teacher training students with details of the sessions available outlined in the conference booklet would be very useful if students are to be encouraged to come to seminars.

Unfortunately, we weren't allowed to keep the Canon Ion even though we did try!

P.S. We would like to go to Bath next year!

An enthusiastic audience applauds the keynote speaker at the York Conference, 1993.



Val and Yvonne – the mainstays of MAPE administration – at the Nottingham Conference, 1994.

Part of the manufacturers' exhibition.

The bar – where important discussions take place!

MAPE Software Information Sheet

Picture Builder
Picture Builder – a tool to explore mathematical shapes. This program provides an introduction to shape manipulation and is aimed at very young children. The Archimedes and Nimbus versions both utilise the mouse to create a user interface that is very easy to use. Pictures can be created from simple building blocks (square, circle, etc.) and manipulated in numerous ways (enlarged, stretched, reflected etc.). The shapes can then be coloured in and output to a black and white or colour printer. The emphasis in the program is on mathematics and shape manipulation.

News Bulletin
News Bulletin – a local viewdata package. This is a package that can be used to create 'electronic magazines' consisting of sets of text pages. These can then be loaded into a display section of the program which allows either continuous cycling of pages or the selection of a specific page. Graphical icons can be added to the pages to supplement the text (Arch version only). An interesting feature of the program is the moving message reel displayed at the foot of the screen, ideal for announcing special events.

Into Europe
Into Europe consists of a teacher's resource book, a book of photocopy masters (for overlay keyboards) and software, all relating to aspects of European life and culture. It is a substantial resource pack that includes files for existing programs (concept keyboard overlays, databases etc.). It includes many ideas for integrating the use of the micro into a European theme.

Graph-IT/Wordplay
Graph-IT is a simple graphical display package for KS1. Children type in the data they have collected and it is immediately displayed on the screen – allowing more time for analysis and interpretation.

Wordplay is a language program for KS2. It generates random poetry from lists of words provided by the children. Meaningless phrases can be discarded and will be replaced. In some cases the children write their own poetry, using *Wordplay* to generate imaginative phrases that otherwise they would not be able to produce themselves.

Stylus
Stylus is a very popular introductory wordprocessor. It uses double height text and has a very clear screen presentation. The BBC and Archimedes versions will also speak the text back to the user. The program also has an in-built facility to create concept keyboard overlays.

(The Archimedes version of this program is not available through MAPE.)

Lost Owls
Lost Owls is a computer program designed for use with very young children to promote both discussion and problem-solving skills. It is a simple adventure game which allows children to explore an environment (in this case a wood). It may be operated from a concept keyboard. A resource pack of teaching ideas comes with the program.

SATCOM
SATCOM is a substantial environmental database for PC and Archimedes machines. It has been produced by WWF in conjunction with MAPE. A number of data modules are being developed for use with the program; the particular module of interest to primary teachers is on the topic of 'Forests'. Primary children use *SATCOM* to navigate the globe, exploring the environmental issues related to different forests in a variety of geographical locations. Further details of this program are available from the WWF Education Unit, Panda House, Weyside Park, Godalming, Surrey GU7 1XR.

Unless stated to the contrary, all these programs are available for the BBC, Archimedes and Nimbus at £9.50 to members and £15 otherwise.

Publications: *MICRO-SCOPE* Specials

The books listed below are *MICRO-SCOPE* publications focusing on specific topics. They are published in addition to the termly journal.

ESP Science Special – 2 first class stamps to cover postage
Special Needs Special – 2 first class stamps to cover postage
Technology Special – 2 first class stamps to cover postage
LOGO Special – £2, including postage
Multimedia Special – £3 to new members (£5 non-members), including postage
Concept Keyboard Special – due at the end of 1994 – £3 to new members (£5 non-members), including postage

Please send all orders (including information about the type of micro) to: MAPE Software, Technology Centre, Newman College, Genners Lane, Bartley Green, Birmingham B32 3NT. Please make cheques payable to MAPE.

Useful contacts

MAPE subscriptions and membership:
Val Siviter, Cilgeraint Farm, St Ann's, Nr Bethesda, Gwynedd LL57 4AX; Tel: 0248 602655

MAPE software and back issues:
MAPE, Technology Centre, Newman College, Bartley Green, Birmingham B32 3NT; Tel: 021 476 1181

MAPE MICRO-SCOPE editor:
Chris Robson, 99 Foxcote, Wokingham RG11 3PG; Tel: 0734 733718

NCET

Milburn Hill Road, Science Park, Coventry CV4 7JJ; Tel: 0203 416994
The information service at NCET can provide you with details of your nearest sources of local support through the Link-IT scheme, and the contact addresses for subject associations.

NCET publications

Assessing IT, NCET 1992
Building IT capability, NCET 1933
CD-ROM titles review, NCET, 1994
CD-ROM in Primary Schools initiative, NCET, 1994
CD-ROM in Education, NCET, 1994
Data logging in the Science Classroom, NCET, 1994
Early Years video, NCET, 1994
Enhancing Science with IT, NCET, 1994
Information Skills in Action, NCET, 1993
Inspecting IT, NCET (with NAACE), 1993
Reviewing IT, NCET (with NAACE), 1994
IT and the under 5s – some journal articles, NCET
Focus on IT, NCET, 1991
Making Links, NCET, 1993
Starting from Stories, NCET, 1993

Hardware manufacturers

Acorn Computers Ltd, Acorn House, Vision Park, Histon, Cambridge CB4 4AE; Tel: 0223 254254
Apple Computers (UK) Ltd, 6 Roundwood Avenue, Stockley Park, Uxbridge, UB1 11BB; Tel: 081 569 1199
Research Machines plc, New Mill House, 183 Milton Park, Abingdon, Oxford OX14 4SE

Software producers are too numerous to list here but the manufacturers can provide information about software available for their machines. Alternatively, you can pursue your particular interests at one of the events listed below.

Diary dates

RESOURCE Conference at Doncaster, 25 November 1994
BETT Exhibition at Olympia, 11–14 January, 1995
MAPE Conference in Bath, 7–9 April 1995
World Conference – WCCE 95 in Birmingham, 24–28 July 1995

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MICRO-SCOPE Editor	Chris Robson, 99 Foxcote, Wokingham, Berkshire RG11 3PG. Tel: 0734 733718 Campus: YNE009 FAX: 0734 733718
Business Manager	Roger Keeling, Newman College, Genners Lane, Bartley Green, Birmingham B32 3NT. Tel: 021 476 1181 FAX: 021 476 1196
MAPE Administration	Mrs G.E. Jones (MAPE), 'The Old Vicarage', Skegby Road, Normanton on Trent, Notts NG23 6RR. Tel: 0636 821647
MAPE Membership	Val Siviter, Cilgeraint Farm, St Anns, Nr Bethesda, Gwynedd LL57 4AX. Tel: 0248 602655 FAX: 0248 602655
MAPE Sales	Yvonne Peers, Technology Centre, Newman College, Genners Lane, Bartley Green, Birmingham B32 3NT. Tel: 021 476 1181 FAX: 021 476 1196

Regional Representatives

CHILTERN
Betty Lumley, 28 Westbury Road, Northwood, Middlesex HA6 3BX
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0752 365250 (work)
LEAs
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CO-OPTED MEMBERS
André Wagstaff, NCET, Milburn Hill Road, Science Park, Coventry CV4 7JJ
Tel. 0203 416994 FAX 0203 411418

Chris Robinson (LogoS observer), 3 Cowdray Park, Hill Head, Fareham, Hants PO14 3SA
Tel./FAX 0329 661565

Roger Keeling
Newman College, Genners Lane
Bartley Green, Birmingham B32 3NT
Tel. 021 476 1181 FAX 021 476 1196

MICRO-SCOPE

Buy portable p.c. – *carry on*		Attend MAPE Conference – *you've won!*		START HERE
SAVE your work – *or go back to the beginning*				Plug in computer – *move forward 1 space*
IGNORE COPYRIGHT – *GO TO JAIL!*				Corrupt disc – *miss a turn*
MULTIMEDIA – *move forward 6 spaces*		Computer virus – *you've lost the game!*		Contact Computer Centre – *move forward 3 spaces*

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Price: £5.00

Published by Castlefield (Publishers) Ltd, Castlefield House,
12 Headlands, Kettering, Northants NN15 7HP

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