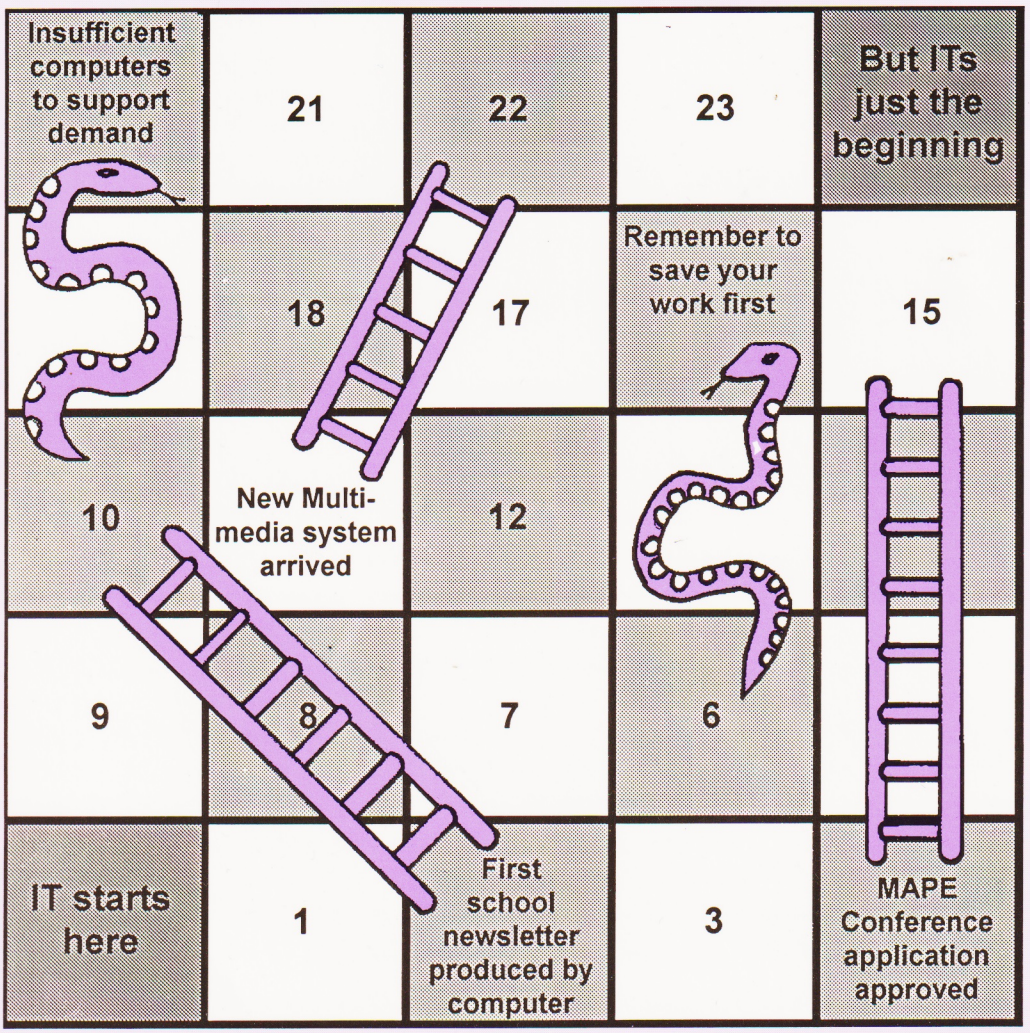
MAPE

- Revised
- Autumn 1998
- In collaboration with BECTa

IT Starts Here!



NEWMAN COLLEGE with MAPE

Contents

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IT starts here . . .

Rhona Dick

Since MAPE first published **IT Starts Here** in the Autumn of 1994 there have been many changes in education generally, and in IT more specifically. Among these is a change of name from IT to ICT. There is still a degree of confusion about the two. Are they synonymous and interchangeable? Well, no, not as I understand it. Information Technology (IT) is about the skills, knowledge and understanding needed to be able to make effective use of Information and Communications Technology (ICT). In short IT is about developing capability. In this revised publication, therefore, you will find a mixture of terminology.

IT is perhaps a subject which polarises people unlike any other. Even though computers have been in schools now some 15 years or more, and our young teachers should have had some access to them throughout their school careers, still there are many, young and not so young, who shy away from using them to support their teaching. The National Curriculum has always stressed the importance of integrating IT into other curriculum areas, and now with the arrival of the Initial Teacher Training National Curriculum, teachers will be required to demonstrate their skill, knowledge and understanding of the use of ICT in subject teaching.

The introduction to the ITT National Curriculum for the use of ICT in subject teaching states that:

> *'ICT is more than just another teaching tool. Its potential for improving the quality and standards of pupils' education is significant. Equally, its potential is considerable for supporting teachers, both in their everyday classroom role, . . . and in their continuing training and development.'* page 17[1]

The curriculum itself is in two parts: Section A deals with effective teaching and assessment methods with particular reference to those aspects which relate to the use of ICT in subject teaching. This section covers such diverse subjects as:

- the effective use of ICT in relation to subject related objectives
- the identification of ICT in lesson planning, including key questions to ask, and assessment opportunities
- the effective organisation of ICT resources in the classroom to meet subject learning objectives
- the contribution ICT can make in the teaching of pupils with special educational needs
- the selection of the most suitable ICT to meet the teaching objectives of the lesson.
- how to develop IT capability
- how to monitor, evaluate and assess pupils' learning
- the importance of ICT in the nursery and reception classes

[1]Teaching: High Status, High Standards page 17 (DfEE 1998).

Section B looks more closely at teachers' knowledge, understanding of and competence with ICT, and requires that teachers

- can use ICT tools for their own and their pupils' benefit
- know and understand the nature of information, its storage, retrieval and manipulation
- know how to use ICT to find things out, deal with data, sort and search, interpret, and question the validity of outcomes
- can use ICT to make things happen, changing variables, modelling situations, sequencing instructions
- can communicate ideas in different ways for different audiences
- understand the features of ICT, its speed, its capacity, its provisionality and interactivity
- can demonstrate an awareness of the potential of ICT to make their teaching more effective
- are familiar with the National Curriculum, generic tools, reference resources, and some of the major teaching programs

Teachers are also now expected to know current health and safety legislation, and take precautions to minimise risk to themselves and their pupils.

This might all look quite daunting at first glance, the key to successful subject teaching using ICT is confidence and familiarity with the hardware and software, as well as a detailed knowledge of the subject curriculum.

MAPE has aimed to address as many of the issues as possible here but there is no substitute for hands-on experience. An audit of your own skills, knowledge and understanding will indicate any gaps that need to be filled. At the back of this publication you will find a simple matrix which will help you assess your own needs in terms of IT capability.

MAPE is grateful to BECTa for their support in agreeing to the reprint of their information sheets in this publication. The full range is available from:

BECTa
Milburn Hill Road
Science Park
Coventry
CV4 7JJ

or on their website:

http://www.becta.org.uk

If you would like help or advice with any aspect of ICT get in touch with MAPE and we will aim to provide it.

What MAPE can do for you

Heather Govier

The ITT National Curriculum makes substantial demands on teacher trainees to develop the knowledge, understanding and skills which will enable them to use ICT effectively in support of their teaching. Although colleges will carry much of the burden of training provision, it is important for you, as a student teacher, to take responsibility for your own development in this area. This is particularly important because ICT is a rapidly changing field which will require an on-going commitment to new learning throughout your career.

MAPE can help.

For the cost of a student membership (still only £10) you will receive support in all of the following areas:

- Hardware issues – such as how to optimise use of the resources available to you and to plan for upgrading and development.
- Software issues – such as what to look for in choosing new software and how to make best use of programs already in school.
- Curriculum Issues – such as ideas for effective teaching using ICT in all areas of the National Curriculum (including literacy and numeracy) and also as a subject in its own right.
- Communications Issues – such as how to get on-line and how to use email and the Web to enhance teaching and learning.

MAPE Membership Provides the Following:

- A termly newsletter to keep you fully up to date with all developments in ICT, including reports of government initiatives, reviews of software and feedback on shows and conferences.
- Termly Focus Packs, each covering a different area of the curriculum and containing activity sheets, teaching ideas, software and associated support materials and resources.
- An annual MAPE magazine with articles discussing issues of current concern or presenting case studies of effective classroom practice.
- A dynamic Web site containing an on-line newsletter and pages of activities and teaching ideas.
- A number of email discussion groups and a help line for your ICT problems.
- Access to a variety of training events, courses and conferences.
- Discounts, negotiated for members, on many software packages and support materials.

In all these ways MAPE can help you to meet the requirements of the ITT National Curriculum and to carry on learning about the uses of ICT in education as you move onward and upward in your teaching career.

How could you even dream of proceeding without us?

Information Technology – why bother?

What is IT?

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

Why is IT important?

IT is playing an increasingly large role in all areas of life – the home, the work-place 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.

What does IT help pupils do?

IT allows pupils 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 pupils to use IT in school?

Pupils using IT 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, IT can enhance and extend pupils' learning in many subject areas. In mathematics, for example, pupils 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, pupils 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 pupils can interpret their graphs.

What does the National Curriculum say about Information Technology?

IT is incorporated into the National Curriculum for two reasons:

- to extend and enhance learning in all the subject areas
- to help the pupils develop IT capability.

IT capability will be developed progressively over a pupil'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.

Building IT Capability

Towards Information Technology Capability at Key Stages 1 and 2

ICT in the curriculum

A child who has developed IT capability should

- be confident in the use of ICT
- select and use ICT equipment and software confidently and purposefully to support their work
- identify situations where the use of ICT would be relevant
- be able to reflect and comment on the use of ICT
- recognise that ICT affects the way in which people live and work.

Information technology (IT) capability is characterised by an ability to use effectively ICT tools and information sources to analyse, process and present information, and to model, measure and control external events.

The National Curriculum outlines the IT experiences and understanding which a pupil should have in order to develop IT capability. This is organised into three strands:

- the overview
- communicating and handling information
- controlling, measuring and monitoring

The Overview identifies the opportunities which must be given to all pupils. These include opportunities to use a range of equipment and software in a variety of ways, to consider the purpose and limitations of ICT tools and activities, to apply their knowledge and understanding of ICT to new and unfamiliar systems and to assist their investigation of problems. They should also have opportunities to reflect on their own use of ICT in order to explore whether they have used it effectively and to notice how ICT is used in everyday life. They are encouraged to discuss the social, economic, ethical and moral issues raised by ICT.

Why do children need to reflect on the use of ICT in their work and the wider world?

It is important that pupils develop an awareness of the growing use of information technology applications in society and an insight into the effect that this has on the quality of people's lives.

The National Curriculum encourages children to understand that information technology can be used to perform familiar tasks in a new way and enables them to do things that they could not do before. They are also encouraged to reflect on whether using ICT is necessarily the best way to tackle a particular task and to be aware that inaccurate information may be held on a computer.

For example, children visit a supermarket, a bank or an office and make a list of all the ICT applications they recognise. They talk to people who use ICT in their work to find out how they feel about it and in doing so begin to develop an awareness of the social, economic and moral implications of using information technology.

The Application of IT

The National Curriculum is very clear on the importance of pupils understanding the role of ICT in our society and of the value of ICT in their own lives. Without this understanding it might be possible to see the other aspects as simply developing IT skills such as word processing, data handling and so on; in fact, each aspect of working with ICT should involve the pupils developing an understanding of what they are doing as well as their ability to use IT mechanically. It is important that teachers encourage this change in focus from practical use to reflection.

At level 1: *(Pupils) recognise that many everyday devices respond to signals and commands. . . .*

Pupils should be encouraged to look at and talk about how everyday items like video recorders, TVs, telephones, fax machines etc. work and how they can be controlled.

At level 2: *(Pupils) use IT-based models or simulations to investigate options as they explore aspects of real and imaginary situations.*

Pupils can be given opportunities to look at 'real life' situations which would otherwise be impossible or too dangerous for them to experience, for example, flying a space shuttle or running a petrol station. They can then be encouraged to talk about how simulations can help us in every day life.

At level 3: *(Pupils) describe their use of IT, and its use in the outside world.*

When word processing a piece of work for the school newsletter, pupils can be encouraged to think about the style and layout required for their work and how they can use a scanned picture to illustrate their writing. The pupils can be encouraged to think about how these and other ICT applications can be of benefit in the outside world, for example, in publishing a daily newspaper or a magazine.

At level 4: *(Pupils) compare their use of IT with other methods.*

When using a word processor or painting program, for example, pupils can be encouraged to consider whether the computer is helping them to do something better than they could otherwise do it, or whether they can think of other ways of doing things that may not involve the use of the computer.

At level 5: *(Pupils) communicate their knowledge and experience of using IT and assess its use in their working practices.*

When undertaking a piece of work, pupils make decisions about whether or not it is appropriate to use ICT. They make decisions about which software application would be most useful to them and how it would benefit their work. When presenting their work to others in the class they are able to describe their ICT work in some detail and present a reasoned argument about why and how the ICT was of use.

Communicating and Handling Information

Communicating and handling information will provide the mainstay of a pupil's ICT experiences, permeating activities across most subjects of the curriculum and providing situations where many of the opportunities outlined in the first part of the Programme of Study can be developed.

Communicating information

This is the area of ICT with which most teachers are familiar, including, as it does, the most frequently encountered use of computers: word processing. However, word processing is not the totality of this area and teachers may also need to seek out opportunities for pupils to use graphics or music programs.

Handling information

This is often thought of as the 'database' strand but is actually much more. It is only when pupils have some understanding of how to sort and classify information, real or imagined, that they can begin to understand what a database is and what it can do. Teachers should provide opportunities for pupils to develop these concepts in a variety of situations.

At level 1: *Pupils use IT to assemble text and symbols to help them communicate ideas. They explore information held on IT systems, showing an awareness that information exists in a variety of forms.*

This does not mean that children have to be able to load or save work. For example a teacher could set up a program for the pupils to match words and pictures, use within a role-play area or use as a stimulus for group story-writing where they take turns at the keyboard. They may use a graphing program to record how children travel to school and print out their graph to add to a display.

At level 2: *Pupils use IT to help them generate and communicate ideas in different forms, such as text, tables, pictures and sound. With some support, they retrieve and store work. They use IT to sort and classify information and to present their findings.*

Pupils may choose computer-generated pictures or symbols for something like dressing a teddy, to play back a simple tune built up by choosing pictures, or type simple words or phrases into a word processor. They use a program to help them sort vegetables and fruit. With help, they save their work and are able to load it and continue working at a later date.

At level 3: *Pupils use IT to generate, amend, organise and present ideas. They use IT to save data and to access stored information, following straightforward lines of enquiry.*

They describe their use of IT, and its use in the outside world.

This implies that pupils working in any curriculum area can draft and re-draft work on, say, a word processor, save their work, print it out, retrieve it and further change it or add to it later. Pupils who have collected and entered details about themselves into a database prepared by the teacher can decide what information they want to view and locate it in their database.

At level 4: *Pupils use IT to combine different forms of information, and show an awareness of audience. They add to, amend and interrogate information that has been stored. They understand the need for care in framing questions when collecting, accessing and interrogating information. Pupils interpret their findings, question plausibility and recognise that poor quality information yields unreliable results.*

Pupils working at level 4 will be able to take their work further by loading into the computer a file they had previously saved, developing some of the ideas of this first draft and by cutting and pasting words, images or sounds so that they change the order in which they appear or the style and content for a particular audience. They will also be able to print, save changes and re-load them again at a later date.

When looking at, say, pupils' heights on their class database pupils may notice errors. Having spotted an error they can amend the entry. Pupils may recognise the error in a pupil's height entry when they are looking at the information screen or when the heights are displayed in graph form – a sudden sharp rise or fall in a graph will alert them to the possibility that there has being an error in entering the data. They might also add information from pupils from another class in order to help them to frame questions like, 'Do all the fair-haired children have blue eyes?' or 'Are boys taller than girls at this age?'.

At level 5: *Pupils use IT to organise, refine and present information in different forms and styles for specific purposes and audiences. They select the information needed for different purposes, check its accuracy and organise and prepare it in a form suitable for processing using IT.*

They communicate their knowledge and experience of using IT and assess its use in their working practices.

Pupils will be able to draft, re-draft, develop and present their work in a variety of different ways for a specific purpose or audience. For example, words and pictures which have been developed by a group of children as a report on a visit to a nature reserve might be reworked to appear as a short article in the school magazine. They are able to discuss the benefits of using ICT to assist them with the design and layout of their work and the ease with which they can make changes.

Pupils will identify a need to collect information for a specific purpose. They will discuss why they need to collect that particular information, decide on the most appropriate way of collecting it and the most suitable type of database program to use. They will design a collection sheet, collect the information, organise it and enter it into their database. They will then be able to frame questions and to use the database to help provide them with ans-wers. They may be able to identify patterns and relationships within the data. They will be able to save their data file on disc and load and use the data at a later date. They will be able to discuss the benefits of using ICT to handle large amounts of data and its benefits for graphing and comparing results.

Controlling, Monitoring and Modelling

Control

Pupils will look at how everyday objects are controlled using ICT and will be developing sequences of commands for controlling 'people robots', floor robots, screen images and external devices.

Monitoring (KS2 only)

Pupils will use sensors attached to computers to measure changes in light, temperature, movement or sound.

Modelling

Pupils will acquire an early awareness of computer modelling through the use of simple adventure programs where the rules and objectives are defined clearly. Pupils can make limited decisions within the confines of rules determined by the author, but will be unable to alter the rules governing the outcomes. Later, using simulation or modelling software, pupils will be able to ask 'What would happen if . . . ? type questions and change rules governing various outcomes.

At level 1: *(Pupils) recognise that many everyday devices respond to signals and commands, and that they can select options when using such devices to produce different outcomes.*

Pupils will initially be looking at the different kinds of controls found in toys and domestic appliances. By seeing how other devices respond in a controlled and orderly way, they will begin to develop their own understanding of what a set of instructions might be and how different instructions produce different outcomes. This work will largely be developed away from the computer and will involve a great deal of discussion and practical work which might seem to have more to do with language and number than with ICT.

At level 2: *Pupils control devices purposefully and describe the effects of their actions. They use IT-based models or simulations to investigate options as they explore aspects of real and imaginary situations.*

As part of their project on 'People who help us', pupils give instructions to a floor robot to help them deliver letters to 'different houses'. They are able to discuss what actions they need to take to make the robot go a greater or shorter distance and how to make it return to the starting point.

Pupils use a simulation program to help them decide the order of events required to move an elephant on the back of a lorry. They explore the possible options available to them before trying to operate them in the correct order to achieve the desired outcome.

At level 3: *They understand how to control equipment to achieve specific outcomes by giving a series of instructions. They use IT-based models or simulations to help them make decisions, and are aware of the consequences of their choices.*

Pupils experiment using a control pad to control the movements of a model crane. Having identified which button controls which movement, they work out the sequence of events to make the crane pick up and move an object ready for loading onto a toy truck.

Pupils use an adventure game to explore what life was like in another period of history. They make choices about which character they want to be, where they want to explore and the actions they take as they are exploring. They discuss possible options and outcomes before making their choices.

At level 4: *Pupils use IT systems to control events in a predetermined manner, to sense physical data and to display it. They use IT-based models and simulations to explore patterns and relationships, and make simple predictions about the consequences of their decision making.*

Pupils use a control system which allows them to sense changes in temperature. They set up a mini greenhouse in their classroom in which they place a temperature sensor and mini fan. With some help from their teacher they write a sequence of instructions which displays the temperature on the screen and turns on a small fan when the temperature reaches a certain level and turns the fan off again when the greenhouse cools down.

Pupils use, say, a Logo microworld (a set of procedures written to model a real or imagined situation) to guide a sailing ship around some islands. They notice that the course of the ship is altered by a wind that is blowing from a certain direction. They discuss the effect the wind is having on their ship and determine the 'rule' governing the way the wind is blowing. They guide their ship taking into account the strength and direction of the wind.

At level 5: *They create sets of instructions to control events, and are becoming sensitive to the need for precision in framing and sequencing instructions. They explore the effects of changing the variables in a computer model.*

Pupils working on a project about road safety build a set of traffic lights which they can control using a computer. They write a sequence of instructions to turn the lights on and off. When they first try out their sequence they realise that the lights flash on an off too quickly because they have not built in any delay to the sequence. They edit their sequence to include the appropriate delays.

Pupils set up a spreadsheet to help them decide on the numbers of cups of tea and glasses of squash they will need to sell at the school's Sports Day. They decide that for every 2-degree increase in temperature they will sell 10% more glasses of squash and 10% fewer cups of tea. They model the number of each drink they will sell for various possible temperatures. They test their model, changing the rule, for example, so that for every 2-degree increase in temperature their sales will rise or fall by 15% and see the results of that change.

What to look for . . .

When you are preparing for your first school experiences ICT 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 the use of ICT in the classroom.

Factors for successful integration of ICT

- ***Schemes of work include appropriate ICT activities; the ICT 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 ICT and can talk about what the ICT 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.
- ***ICT-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 ICT is appropriate.***
  They may want to use a word processor when their work is to be read by others or going on display.
- ***Teachers assess and respond to children's developing IT skills alongside their subject skills.***
  Children can show an increased understanding of graphical ways of showing information when using dataloggers to record temperatures or light levels and produce 'realtime' graphs.

Who should I talk to?

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

Your school tutor/mentor
A senior manager
The ICT co-ordinator
Teacher with responsibility for resources
Classroom teachers
Pupils
Parents

What do I need to know?

- Does the school have an IT policy? Is it available for me?
- How does ICT 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 ICT work? (class discs, individual discs, backup copies, printouts) . . .
- How does the school manage the recording of children's progress in IT 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 IT skills)?

Lesson observation

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 ICT. The following two pages are adapted from Inspecting IT: 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, and is available from BECTa.

- ***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
  - IT capability
  - subject knowledge, skills and understanding
  - competence as learners:
    literacy and numeracy
    posing questions and solving problems
    organising and evaluating
    observing and information 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
  - ICT supporting lesson objectives
  - ICT integral to the learning activity
  - activity building on previous ICT experience

– access provided to appropriate range of resources

Lesson content
– matching school plan for IT delivery
– fulfilling the National Curriculum requirements

Delivery
– teacher competence in use of ICT resources
– realistic expectations with sufficient challenge
– active engagement of all pupils
– differentiation and pace
– sensitive intervention
– pupils' IT work assessed and recorded

Contribution to achievement in other areas

- ***Does the use of ICT***
  – enable higher levels of attainment?
  – restrict potential attainment?

What to ask . . .

- ***Discussions with teachers can assist judgements about:***
  – Today's lesson being typical in ICT terms
  – The balance between IT capability and ICT to support the subject
  – The teacher's contribution to the assessment of IT
  – The teacher's contribution to the school's IT policy
  – ICT 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 ICT, pupil collaboration & co-operation, confidence and ability to work autonomously
  – Effectiveness of their use of IT - in IT terms as well as in terms of subject achievements

- **Access to IT:**
  – How typical?
  – How often?
  – In this subject?
  – In this classroom (as opposed to library or Computer room)?
  – Who chooses to use ICT (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 ICT (and make notes and annotations about their successes and failures)
  – Standards of achievement in IT capability
  – How ICT has enhanced the subject
  – IT balance within and between strands

Your child, ICT and the National Curriculum

Children as . . .

Investigators

Children use temperature sensors linked to the computer to test their hypothesis that tea will stay hotter for longer if milk Is added to their teacup before the tea is poured. They also test the insulating properties of a number of different mugs to see whether this will affect the results of their investigation.

Children program the computer using Logo to investigate the relationship between the number of sides and the angles of different polygons.

Children create a database related to a study of the local graveyard. They interrogate the data to investigate whether the age at which people die is higher now than in previous centuries. They discover that an unusually large number of people of all ages seemed to die within a three-month period in a particular year. They investigate church records and discover that a particularly bad outbreak of influenza occurred at that time.

Designers

Children use ICT to design wrapping paper to try out and present their ideas in a number of different colourways without having to redraw and colour them by hand.

Children given a brief to design a kitchen for a disabled pensioner test their proposed design, and, quickly alter the height of work surfaces and door widths in order to accommodate a wheelchair.

Children's designs for winter scarves are created on a computer, and then realised by linking the computer to a knitting or sewing machine, or a loom.

Historians

Children use a simulation to explore a village in Ancient Egypt. They ask questions to find out about the jobs that people in that village do and to find out what particular tools and artefacts are used for. They are able to build up a plan of the village and research the life and times of a particular family during that period.

Children use their historical knowledge and understanding to make decisions about the best place to site an Anglo-Saxon village. They have to ensure that the site they choose can be easily protected from attack and provide them with sufficient land on which to cultivate their crops and graze their animals. They have also to consider ease of access to things like fresh water and wood for building and cooking with.

Children tape record interviews with their grandparents in order to establish how life has changed since they were children. Data from the interviews is entered into a database in order to produce graphs to show things like a comparison between the occupations of their grandparents and their own parents and the changes in the subjects studied at school.

Communicators

Children writing for a class newspaper easily draft and redraft their work. They try out a number of different text fonts and styles and adjust column widths and lengths to fit the required space.

In order to produce posters about Road Safety, they combine text and pictures to produce professional looking results. They also use word processors utilising different scripts to produce posters for Punjabi speakers in the school.

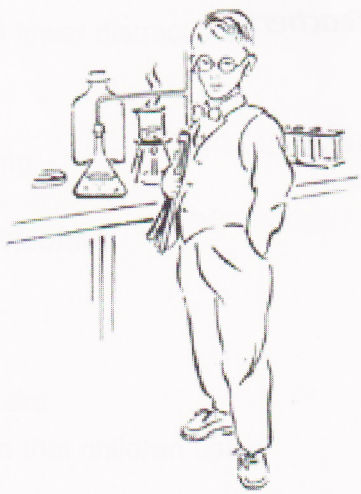
To illustrate a project on 'Wildlife in the Garden' the children record bird sounds, store them on a computer and manipulate them in different ways to produce interesting sound effects and musical scores.

Children taking part in 'Local Studies' projects, communicate with pupils in schools in other parts of the country and in a school in Australia, using fax machines and electronic mail. They send writing, drawings and photographs to each other and are able to build up a detailed portfolio of the areas the schools are situated in.

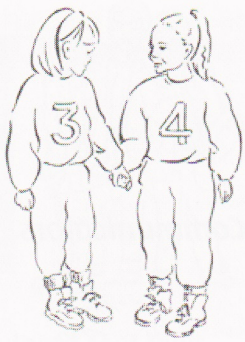
Problem Solvers

Children who have visited the maternity wing of the local hospital decide to construct an incubator to keep premature babies warm. They are concerned that nurses might not notice if a baby's temperature falls too low. The children design and construct an incubator with a built-in temperature sensor and program the computer to sound an alarm if the temperature falls below a certain level. They also include a moisture sensor to show the nurses when the baby needs changing.

Children given the task of running the school tuck shop are keen to make a profit as that will go towards funding the end-of-year disco. They set up a spreadsheet to show the buying and selling prices of their stock and to show the amount of profit each day and at the end of each week. They research sales over the period of a week and gauge that some of the more popular items could be sold at a higher price and the less popular would sell better if they were reduced in price. They test the effect on their profits of the price changes before putting them into effect.



Team members



Children use a simulation in which they work in teams to manage the running of a petrol station. They take on different roles, are involved in joint decision-making and discuss the implications of their actions on the business as a whole.

As part of a 'Newspaper Day', children take on the roles of editors, journalists, graphic artists, sales staff, printers etc. They have group and small team meetings to decide on the content and layout of the newspaper and to make decisions about the priority of stories breaking over the course of the day. They use ICT to produce the copy for their newspaper and to print it out at the end of the day.

Philosophers

Children are encouraged to reflect on their use of ICT and its application in everyday life. They collect data on the kinds of mail received in school over the period of a week and try to establish how the school's name and address has been given to so many companies whose advertising they received. They talk to the school secretary to see how mailing lists are drawn up and they discuss with their teacher some of the implications of personal information being kept on computers.

Children researching life in Victorian times are able to access census records for their area. The head of the local Heritage centre has transferred much of the data from the records onto a computer database. Two groups of children accessing the same information, one from the printed records and the other from the computer, notice that a number of errors have been made when putting the data onto the computer. The children discuss what might have happened and realise that mistakes can be made when entering data. One child relates this to a telephone bill her mother received where an error had been made in the number of units used, resulting in a bill for £565.28.

Teachers

Children sorting beans as part of their work on Jack and the Beanstalk use a computer program which guesses which bean the children have selected. When the computer is unable to guess the bean, they type in a description of the bean in order to teach the computer how to recognise the new bean next time.

Children exploring various mathematical shapes using the programming language Logo are able to teach the computer, by typing in procedures, to draw a square, circle, triangle and rectangle. They use their procedures to draw pictures with these shapes on the screen. They edit their procedures and teach the computer how to draw the shapes with sides of different sizes. They save their procedures on to disc so they can use them in their future work.

Using ICT to support children with special educational needs

Jen Taylor

Although most schools work hard to ensure that everybody gets a fair share of computer time, there is still often a feeling that it should be a reward for good behaviour and trustworthy children. But we know that ICT can be extremely useful in the teaching of children with special needs, and it is one of the things that the Code says should be explored for each child identified as needing extra help to access the curriculum. I recently spent time with children who had emotional and behavioural difficulties. Many of them came into school with poor IT skills – they simply had not been 'good' enough to use the computer facilities at their previous schools. After a very short time in their special school their IT work was well in-line with other children of their age, and it was a context in which they worked happily with friends. The eleven year olds had an important role in the school's in-service training programme, testing and demonstrating new software – real responsibility which developed confidence and respect.

This is a short introduction to using ICT in a primary classroom for children with special needs, both to help them access the curriculum and within their IEPs. We are using a limited and teacher-friendly range of software, although there are lots of other programs that you will find useful for all of your pupils.

Some reasons why ICT is especially good

- ***for children with physical and sensory disabilities***
  - to give switch access to regular classroom activities, matching, sorting, snap, word processing
  - to translate text into speech, speech into text
  - to provide work in a specially adapted format, such as large fonts, particular colours, with symbols
  - to give independence
  - to give an environment for play and investigation
- ***for children with learning difficulties***
  - to give a clutter-free working environment with fewer distractions
  - to produce attractive paper based work
  - to provide clear, focused activities
  - to rehearse skills in a different context
  - to provide numerous repetitions for overlearning
  - to provide multi-sensory ways of learning
- ***for children with emotional and behaviour difficulties***
  - to create a non-judgmental situation
  - to give a highly motivating context
  - to give opportunities for success
  - to give responsibility for their own learning
  - to provide an incentive for completing other tasks

and at the end of the day many people have shown that children using computers work

- harder
- faster
- for longer
- willingly
- cooperatively

and so produce more work, learn more effectively and feel good about themselves. It has also proved a winner in involving hard-to-reach families in their children's learning.

Two sorts of software have proved themselves especially useful, both in general classroom use and to help with specific difficulties

Grids and word processors

Similar to an on-screen concept keyboard.

Some primary schools have also found Widgit Software's '*Working with Symbols*' an excellent bridge to literacy as well as providing resources for making accessible materials

- *free play with talking word processors*
  experiment with spelling, test rules and exceptions, outwit the synthesised speech and create and listen to your own writing
- *reading practice with words from reading schemes*
  make grids so that children can guess, click, hear current vocabulary
- *phonics*
  create grids with phonic elements which can be combined to make different words
- *free writing from a grid*
  give children familiar vocabulary, perhaps from their reading scheme, so that they can combine this in new ways to make their own stories
- *early literacy*
  make grids for younger children with short phrases and optional endings e.g. I like Mum, Dad, pop, cheese. I can run, jump, hop, climb
- *controlled vocabulary*
  provide the words that you want children to use – this might be especially important when you need words for a database and want to ensure that everyone is using the same terms, or for recording the weather
- *exciting and hard words generated by whole class discussion*
  add zip to poems and creative writing by getting some really good words from the whole class to start with
- *topic vocabulary*
  ensure that all the words, for example for talking about pollination, are available to children. It ensures that they are spelled correctly as well as giving a prompt to strugglers

Working with symbols

Writing with symbols

- create concept keyboard overlays or grids to support children's independent writing in the same way that we suggest above, only now with the addition of symbols
- make accessible resources with *Gridmaker* for worksheets, timetables, games, existing reading books, classroom labels, letters
- use Symbols to Sentences for a full range of structured literacy activities from initial letter sounds to hard spelling and cloze procedure

Resources

Point
Clicker 3, Switch Clicker Plus (Semerc)
TalkWrite
Pages (Semerc)
Talking PenDown
Working with Symbols (Widgit)

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 software allows the user 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 to 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. is 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 it is found that one particular individual is dominating the conversation, you might 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 might also provide you with an insight into who contributes what to group discussions.

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 it is easy to forget weeks or months later what the groups were working on. It is also important to remember that where the print-outs 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 use questions such as:
- How did the group decide on what they needed to do?
- Did everyone have a chance to say what they thought?
- How did you manage to save your work? Why is this important to do?
- 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 you consider 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.

I can do IT

Yvette Blake

In Micro-Scope 46 Yvette Blake explained why she had developed the use of 'I Can do . . .' books within her class. Since then self assessment has become evident in more classrooms.

To simplify record keeping, Carol Archer, a member of Cheshire's *'Writing Research and Development Group'* had produced some 'I Can' sheets that she had used with young children. These contained simple statements like, 'I can use full stops' or 'I can write a poem'.

My idea was to develop this format and apply it to IT. Each child would make a Computer Journal in which to record their use of programs along with the IT skills necessary for using them effectively. The 'I Can' tick list would ensure that record keeping would be less demanding in terms of time or writing ability, but would provide evidence, both to the child and to his/her parents, of achievement.

So for each program used the children were expected to write a paragraph including this information:

- name and type of program
- which machine they used
- why they were using it (i.e. which curricular area it supported)
- where the work was recorded (i.e. maths book, topic book, drafting book, display etc.)
- any comments of their own

Then they completed an 'I Can' sheet and included an example of their work if possible. It was usually a piece of their writing, a map, an example from a database or a picture. Our first 'I Can' lists were fairly simple. For example:

Prompt Writer
I can . . .
Load the program,
Use the menu,
Save my writing,
Load my writing,
Change my writing,
Print out my work,
Use the main menu to change the print size.

As we began to use *Phases* we could extend this list to include ideas such as, 'I can use a border.'

With some lists we became more adventurous. This was a list that one child wrote for *List Explorer*.

List Explorer
I can . . .
Load the program,
Use the menu,
Choose an overlay,
Explore the database,
Answer some questions,
Change the information in the database,
Write a new database,
Make a new overlay.

Only a few children could tick off the last three activities but not only did I now have a record of who they were, but the rest of the children knew that there was something more they could do with this program the next time they used it.

By the end of the year the IT books were a great success and were especially helpful at our IT evening for parents. Along with displays demonstrating the range of programs used to enhance children's work in other curricular areas, these books helped to show all the skills their children were acquiring.

Recently we have extended this idea to include the whole school. Every class had their own 'I Can' Book which children signed and we are working towards all the children having their own books to keep throughout their school life.

Art Gallery
I Can . . .
Start up the PC, load *Art Gallery,*
Use the index to find Monet,
Look through his paintings,
Choose my favourite,
Save it by using the option 'copy',
Load *Write,*
'Drop' my picture into *Write* using the command 'paste',
Write about my choice of painting,
Save my work,
Load my work,
Change my work in some way,
Print out my work.

Our 'I Can' lists have continued to develop in complexity as the range of machines has increased to include BBCs, A3020s and more recently a PC with a CD-ROM drive. As this list demonstrates, the necessity to use appropriate IT language is becoming increasingly important.

The lists have gradually become more individualised, in that we have written them to include not only the program itself but also to incorporate some of the tasks set when using the program, for example when using a spreadsheet:

I have	
Sorted the data.	I sorted the data according to . . .
Printed a spreadsheet, chart or graph.	My graph showed . . .
Compared two items of data.	I compared . . .
Drawn a scattergraph and printed it.	
Investigated a correlation between two variables.	My scattergraph compared . . .
Found the average and range of a piece of data.	I found the average and range of . . .

We have used the 'I Can' lists to demonstrate the progression between year groups, for example:

Roamer
I can . . .
Move forwards,
Move backwards,
Turn left,
Turn right,
Make Roamer go on a journey using all four commands,
Draw a square on the floor.

The 'I Can' lists have highlighted the skills and processes used with each program and have demonstrated the possibilities within, and limitations of, each program.

Roamer again!
I can . . .
Use all the main controls,
Follow a set of instructions,
Put in my own program,
Use Roamer to draw certain shapes,
Make Roamer turn 360 degrees,
Use the repeat key,
Explore a set track and investigate a variety of possible programs,
Play music using Roamer.

They have

- shown all of us (both teachers and children) how much IT we have covered
- shown us where to go next.
- shown us we need to think carefully about the experiences offered, particularly the tasks set when using a program.
- provided children with targets to achieve
- highlighted the teacher's expectations of children

Recently we have introduced a code for the ticks especially for the younger children. They tick their list in consultation with the teacher and a green tick means, 'I can do this with the teacher's help,' a blue tick means, 'I can do this with a friend,' while a red tick (or should it be gold!) means, 'I can do this confidently all by myself.' This has also encouraged children to write their own versions. Finally this method of recording has demonstrated to everyone that both the end product and the process involved in achieving that end product are equally valued. The discussion between the teacher and the child, before recording took place, provided a valuable opportunity to ensure that the appropriate language was used, skills demonstrated were understood and reflection upon the learning objectives could be considered.

Although Yvette makes specific references to some particular software the basis of her 'I Can do . . .' sheets apply to any software in use in schools.

Ten tips for quallTy

ICT can . . .

Help you to be better informed

Information which can be saved and printed out can be accessed, via a computer and a modem, from on-line databases for the cost of a telephone call. In addition, vast amounts of information can be accessed using a computer and a CD-ROM, but this is not always regularly or cheaply updated. (A CD-ROM is a compact disc holding masses of information – text, sound and pictures – for use with a computer).

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

Save you time

Using ICT to plan and create worksheets which can be easily changed and edited will reduce the amount of time you need to spend on preparation. Creating spreadsheets will for example allow you to record payments for the school trip. You won't have to juggle numerous pieces of paper.

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

Help you to support differentiation

Since using ICT allows the easy creation and editing of 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.

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

Improve your image

ICT allows the easy creation, editing and printing of text and graphics and it is therefore ideal for preparing and easily updating your CV or your teaching materials.

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

Improve your efficiency

The introduction of management information systems (MIS) has made the use of ICT for assessment, recording and reporting a real possibility.

- *Did you know . . . that you can register students' attendance electronically?*

Improve the image of your institution

ICT allows text, pictures and graphics to be easily changed and combined to produce, for example, high quality, professional looking programmes for school events.

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

Support your creativity

ICT can offer interesting ways to present work. For example, software packages which allow the production of multimedia presentations can be used to show students' work, or to provide continuous 'slide show' guides at events like open days.

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

Help you cut down on repetitive tasks

ICT is excellent for removing the drudgery out of boring or repetitive tasks.

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

Help you manage money better

Spreadsheets can be set up to help you monitor and manage, for example, purchases and sales for the tuck shop or trips. Formulae can be placed within the spreadsheet allowing you to test out what effect changes might have on a situation.

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

Help you bring your teaching to life

ICT is interesting and motivating for most students and its use will help you to enhance your teaching and learning. Also, by providing students with access to things 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 . . . 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?*

Educational CD-ROM

What is it?

In essence, CD-ROM is the domestic audio product adapted for electronic publishing and computing applications.

The volume of data that can be stored on one disc is between 250,000 and 400,000 A4 pages of text (enough for a typical multi-volume encyclopaedia), or 2,000 high-quality images, as well as video, sound, or a combination of different media. Increasingly products are multimedia in nature. Newspapers, dictionaries, encyclopaedias, atlases and talking books, as well as many entertainment titles, are just some examples now available on CD-ROM.

How can CD-ROMs help in the classroom?

The huge amounts of information which can be stored on a single CD-ROM and the potential ways in which that information can be searched, accessed and retrieved pose an exciting challenge for classroom practice. Another major value of the medium is the potential it offers for speedy access to the data. Virtually every word in a text-based CD-ROM can be used as a search term, enabling children to retrieve information easily and in ways not possible in printed formats.

CD-ROMs offer the potential to augment significantly schools' ability to deliver a rich, high-quality set of educational experiences and resources.

CD-ROM titles are numerous and varied and can cover:

- material for young children – interactive titles/animated story books
- educational resources – for all ages, all subjects often with a National Curriculum focus
- reference works – encyclopaedias, language and subject dictionaries, yearbooks, etc.
- non-fiction titles – the so-called edutainment products
- leisure items – music, drama, film, sports, hobbies and pastimes
- games – state-of-the-art arcade games, strategy and simulations
- shareware – collections of clip-art, graphics, photographs, videos, sound effects
- applications software – demonstration discs, software updates and installation programs.

Evaluating CD-ROMs

Like all technology, whilst CD-ROM can seem very seductive at first glance and some CD-ROMs offer much to the user, you should take time choosing what to buy. At a typical cost of £30–£100, you will need to consider how many times they might be used before boredom sets in.

There is a need to ensure that any CD-ROM titles chosen offer educational value for money. Schools and colleges will wish to choose new titles carefully. It is worth taking some time to map the titles you already have against the National Curriculum Programmes of Study. If you are starting from scratch, then a general-purpose encyclopaedia with a suitable reading age is probably the best first buy. The evaluation of any title breaks into two:

- Will it run successfully on my equipment?
- Will it suit the learning needs of my pupils?

Whilst you may be able to read educational reviews of a range of CD-ROM titles, there is no substitute for being able to inspect the disc for yourself.

Checklist – questions to ask

- How appropriate is the quantity of information?
- Does it fit well with the curriculum?
- What is the source of the information?

Content and coverage:

- Is it biased culturally or nationally?
- What is its cultural and moral tone?
- What is the balance of text, illustrations, audio and video?

Currency and accuracy:

- When was it published?
- Is this the most recent version?
- How accurate is the information?
- Does it contain facts or just opinions?

National Curriculum:

- Which subjects/topics does it cover?
- Which key stages does it address?

Many CD-ROM discs are not developed in the UK exclusively for our education system: Discs published in the USA may have a strong American bias.

Reading age:

- Is the vocabulary, structure and sentence length suitable?
- Does it have a built-in dictionary?
- Are differentiated versions of the text available?
- Does the retrieval of information depend heavily on correct spelling?
- Is there an audio option?

Choosing resources with a suitable reading age for your pupils is always important. Children are often expected to retrieve and synthesise the information found on CD-ROM, and to do this they need to be able to find it and understand it.

There are several features on CD-ROMs that can assist both reading and understanding. Some discs have audio options that read the written text aloud or provide a commentary that supplements the text. Animation and film clips can often explain things more clearly than text alone. Discs that offer alternative routes through the information are likely to suit a wider age range than those which do not. Accurate spelling can be crucial when searching by keyword, so discs which offer navigation via menus, indexes or icons are very supportive to those who have problems in this area.

Design, construction and flexibility:

- Are the buttons, menus and icons clear?
- Is it obvious how the information is structured and organised?
- Is on-screen help available?
- Is navigation easy?
- Are there alternative routes through the material?
- How easy is it to retrieve information?
- Is there an index?
- Is there a contents menu?
- What is the quality of illustrations?
- Can the audio and video elements be controlled?
- Can you alter colours and size of text?

On discs that contain factual information, it should be easy to find, manipulate and retrieve selected parts. Different routes through the information will increase the chance of pupils finding what they want. The level of interactivity the disc requires from users can also be important. Titles which allow users to input their own data are likely to create a stronger level of engagement. The ability to switch audio on and off is essential in classroom situations.

Facilities and features:

- Can you print and save selected material?
- Can you record what users have seen?
- Can information be tagged or marked?

The facility to save information (text and pictures) to disc or to print it out can be very useful. Always check the copyright statement on the product, however, if you want to use any items in other documents. Support materials supplied with the disc may also form part of your evaluation.

Impartial reviews of over 600 educational CD-ROM titles are now available on the Internet. The reviews cover three platforms – PC, Apple and Acorn. The CD-ROMs have been evaluated by panels of curriculum specialists from education authorities and national organisations, and many of the reviews contain three screen shots of the CD-ROM alongside the evaluators' comments.

- *The URL for CD-ROM reviews is:*

  http://www.becta.org.uk/cd-rom.html

Portable computers

Portable computers have increased in popularity over the last few years and are no longer considered a niche product.

What is a portable computer?

A portable computer is designed to be readily transportable and generally comes with a carrying case. The space it occupies, its 'footprint', is A4 or less with palmtops being as small as A5 or A6.

Portable computers are more versatile than desktop computers in that they bring:

- mobility
- diversity
- flexibility

Unlike desktop machines portables can be taken to where they are needed and can provide teachers with easier access to computers in their own teaching areas. Portables allow teachers, pupils and parents to work in their spare time and develop confidence and competence in IT.

There are a number of specific types of portable and the size is becoming ever smaller.

Notebooks have a clam-shell design with a hinged lid that opens to reveal the screen and keyboard. They are mostly A4 telephone directory size and weigh 2–3.5 kg. Most of these machines have keyboards with full-size 18 mm square keys.

Sub-notebooks are designed for users who want the processing capabilities of a conventional desktop machine but require a small lightweight machine.

Palmtops are pocket-size computers which retain the folding clam-shell design of notebook machines but are much smaller, lighter and have a much longer battery life.

PDAs (Personal Digital Assistants) and similar devices do not have a keyboard, typically being controlled using a stylus in conjunction with a touch-sensitive screen. As such, they are more oriented towards accessing data which has been downloaded from a desktop machine, rather than entering it.

Low cost word processors are a compromise between notebooks and palmtops. Prices start at around £150 for basic models. Seen little outside of education, these systems have been used very effectively within the classroom, their low cost allowing each pupil access to a machine.

Input devices There is a variety of input devices for portables including keyboards and pointing devices. Pointing devices which may be available on a portable, each of which will tend to have one or more 'mouse' buttons:

- ***Trackpad*** – moving a finger around this small touch-sensitive pad moves the cursor around the screen.
- ***Trackpoint*** – this small joystick device looks like a pencil eraser and sits in the middle of the keyboard. Pushing it in any direction moves the cursor on the screen.
- ***Trackball*** – few manufacturers now offer this method. To move the cursor the user rolls a small plastic ball, which acts like an upside-down mouse.

Security issues of owning a portable

Treat your portable computer with the same care as you would a video camera. Portable computers are valuable and easy to steal, so have them security marked and make sure they are securely stored. Also be aware of the value of the information which your portable contains and, in many instances, the confidentiality!

The Internet

Robert Kensit

If you have never 'surfed' the Net, sent an e-mail, or been on-line, don't worry. You belong to a substantial majority of the population. There is no need to feel inadequate, unintelligent or uncool. However, as a teacher you may very soon find it necessary to make use of the Internet as part of your professional practice, in common with many other professionals in government, industry and finance.

The Internet is not really a single entity any more than the Global postal service is a single entity, but a collection of services and electronic connections. It is less than ten years old and is growing rapidly. This makes it difficult to define exactly what it is, where it is, what it will become, or what exactly it can be used for. No one has yet decided on these things.

The word Internet means a Network of Networks. A network is a set of computers, often but not always in the same building, which are linked together by cables, allowing them to share programs, files, and also items of hardware such as printers. The Internet is a way of linking together both individual computers and Networks. Making use of existing and newly constructed telephone lines and satellite connections, the Internet covers the whole planet, and issues of distance and nationality are largely ignored.

The idea of transmitting information is not new; telephones transmit speech, and telexes and faxes use the same connections as telephones to transmit text and images. Directly linking computers so that they can exchange data is simply an extension of this technology. Most Internet connections are still made using ordinary telephone lines, although alternative, more efficient means of communication such as optical cable and radio may soon take over.

What makes the Internet different to the principle of the fax is that you do not have to dial the number of a particular computer that you want to connect to. Instead, when you are connected to the Internet, you are one part of a Global interconnection of millions of computers, and can communicate with any of them at any time.

Large companies keep their own Networks of Computers permanently 'on-line', that is, connected to the Internet, but for most small companies or individuals this is impractical and expensive. They pay a subscription to an ISP (Internet Service Provider), a company which they connect to when required, and through which they are linked to the internet.

To connect to the Internet from your computer, you need a modem to convert information on the computer into signals that can be sent down the telephone line and vice-versa. You also need programs to do things like read and write e-mails or view Web pages. The hardware and software involved in Internet access are amongst the most complex and temperamental that you are ever likely to use. It is almost inevitable that technical problems over Internet access will arise from time to time, and have to be put up with. The good news is that the efficiency and ease of use of both hardware and software is improving all the time.

There are many different aspects of the Internet; the World Wide Web, e-mail, chatrooms, File Transfer Protocol, and more. The two that you are most likely to use are e-mail and the World Wide Web.

E-mail is simply an electronic form of sending letters. You send a message to another person using their e-mail address. When someone sends you e-mail, it is kept by your ISP until you next connect to them, when you can receive and read your mail. E-mail is much quicker than ordinary mail, and cheaper. You can also send any other form of data already on your computer, such as images, sounds or even programs as an 'attachment' to the e-mail, rather like slipping an extra photograph in with a letter you post to someone.

The World Wide Web is a little more abstract. It is a form of 'hypertext'. Hypertext is the way in which information CD-ROMs work, in that items of 'text' (which can mean written text or images, diagrams, video, animation or sound) can be found through various indexes and linked to each other, these links being operated by clicking the mouse when the cursor is over a 'link' to another piece of text. For instance, the word 'petrol' within a description of a car may be a link to the section about how petrol is manufactured.

The World Wide Web is rather like a gigantic work of hypertext, with millions of pages kept on computers across the World all interlinked to each other. This means that unlike most other Internet services, you tend only to look at the World Wide Web rather than take an active role when using it.

The World Wide Web is completely different to the way in which an encyclopaedia on a CD-ROM works in several important ways, and not just because it is much bigger. Firstly, it has not been centrally planned and constructed, but is an interconnection of millions of individually created sections which contain information about whatever the author wants to publish – a lot of this is irrelevant or silly, and some of it offensive. If you want information about science and technology, there is so much information on the Web that you will find it difficult to find the exact information that you need, but if you want information on Ancient history, you may find very little.

It has been said that finding information on the Web is very easy, but finding the information you actually want is very difficult. This is quite true. There are some wonderful educational resources on the Web, but it has taken countless hours researching to do so.

The government's planned 'National Grid for Learning' will collect together and categorise resources on the Web, making them easily and quickly accessible by teachers. Also, with more and more schools getting connected to the Internet, the Web sites of organisations such as MAPE will be able to provide links to, and information about the most useful links to other parts of the Web.

MAPE's web site can be found at
www.MAPE.org.uk

My computer does not work!

Robert Kensit

Part One – How to stop things going wrong before they start

1 Keep the computer away from excessive heat and light, and also dust. Dust settling over internal components in the computer is one of the most common causes of computers failing, so if you use a chalkboard keep the computer away from it!

2 Keep wires and sockets tucked away where they cannot be accidentally pulled out.

3 Use a good quality mouse mat and replace it when it gets worn. Also, consider getting a mouse house (or mouse holder) to keep the mouse in when it is not in use. A mouse house is a small container which you can attach to the side of the monitor with a sticky pad.

4 Every so often, take the ball out of the mouse (the cover in the base twists off) and clean the ball and the small metal rollers inside the mouse using cleaning cloths designed to clean CDs and computer screens.

5 Try to keep the screen and keyboard reasonably clean by wiping them with a cloth occasionally.

6 Apply the same principles of good organisation to the computer that you do to the rest of the classroom. Keep the area tidy, but also make it attractive. There is no need to make the area in which computers are kept look like a laboratory – this is especially true for computer rooms. Use posters, examples of children's work, and labels to make it an attractive place to work in. If the children feel that the computer belongs to them, they are more likely to take care of it themselves.

7 Use the correct procedures for switching the computer on and off, and for opening and closing programs. Only use the 'reset' button or similar 'escape' procedures when there is no alternative. Also, do not switch the computer on and off more than is necessary. It is quite safe to leave a computer on overnight, and if the monitor is switched off it will use almost no electricity. Switching it off occasionally, for instance over the weekend is enough to give the internal parts a chance to cool down.

8 Keep all software media – floppy disks, CD-ROMs, etc., in appropriate containers when not in use.

9 Never put magnets anywhere near the monitor or floppy disks.

10 Under no circumstances should you decide to 'borrow' or 'swap' printers or any parts of a computer without consulting the ICT coordinator. You can easily mess up the setting on both computers.

11 Do not wait until a group of children are sitting expectantly around the computer before switching it on. Have the required software running before the school day begins so that you can deal with any problems that occur and if anything serious has gone wrong, you can at least prepare alternative activities for the children.

12 If you have to switch a computer off and turn it on again, wait for at least 30 seconds before switching it back on. Switching a computer off and on immediately can result in not coming back on at all.

Part Two – When something does go wrong!

First of all two pieces of general advice.

- ***Do not panic***

You will make the situation worse if you do something silly because you are flustered. Rather than trying desperately to fix the problem immediately, it will probably be better to leave the computer alone until you can work out what to do.

- ***Do not assume that it is your fault***

Computers are very complicated and very temperamental, and will do unexplained things from time to time. Do not assume that you have done something wrong. Even if you have, take the opportunity to learn from your mistake.

1 *I turn the computer on and nothing happens!*

Check that it is plugged in at the mains and the plug is switched on. Don't laugh, it often is the source of the problem. Then check that the mains lead is firmly plugged in to the back of the computer and has not come loose. If still nothing happens, check that the mains lead and the fuse in the plug are not faulty. If they are working, there is nothing more you can do. There may be a simple fault, such as an internal fuse that needs replacing, or a more serious problem, but it will need a technician to deal with it.

2 *The computer comes to life when I switch it on, but the monitor is not working!*

Again, check that it is switched on, and that the power lead is properly fitted. If there is a small light on the front of the monitor, you can tell whether power is getting to the monitor or not. If it isn't, the monitor probably has a major fault and may need to be replaced. If power is getting to the monitor, check that the cable which sends the image from the computer to the monitor is correctly fitted. If you are seeing odd colours, lines or flashes on the screen, it is likely to be caused by a faulty lead or connection. If the screen is blank, and the connection is good, check the settings of the brightness and contrast controls which are usually along the bottom of the monitor casing. Children fiddling with these controls is one of the most common causes of 'faults' in school computers.

3 *The computer is making funny noises!*

The hard disk inside your computer is like a stack of great big floppy disks, and the 'head' which reads information from these has to skip across the disks and between them very quickly, and it can make some quite odd metallic noises when it does so. Usually, this is nothing to worry about. There is also a fan inside the computer which keeps the processor cool, and although these fans are not particularly loud, the noise can be rather intrusive (this is not, however usually a problem in the classroom while the children are in it.) Sometimes the fan may be catching against something and be much louder than usual. This noise can be a little irritating, but is not likely to cause any damage and usually the problem corrects itself after a while. If the hard disk does start making really alarming scraping noises, then there is something seriously wrong. You may be able to carry on using it for a while, but it will need to be seen by a technician.

4 *My computer starts up, then stops before completing the start-up procedure*

Check that there is not a floppy disk left in the disk drive. A PC will look for start-up information on a floppy disk before looking for it on its hard disk, and if there is a floppy disk in it which will not start it up, it will display a message saying:

'replace disk in drive A and press any key when ready'

Take the floppy disk out and press any key, and the computer should start up. (By the way, 'any key' does not mean a key with the letters A-N-Y on it. Don't laugh. Some people

have spent hours looking for it.) If the computer comes up with any odd messages or beeps, and then gives up, it probably means that something is seriously wrong. Try turning the computer off and restarting it. If the same thing happens, there is a serious error and a technician needs to deal with it. Write down any messages that appear on the screen, as this will help the technician to find out what is wrong. Also, make a note of how many times the computer beeps when being turned on. A PC will make one beep when turned on if it working correctly. If it emits more than one beep, it is telling you that there is a problem. A technician can get a good idea of the cause of the problem from the number of beeps emitted.

5 *The operating system (DOS, Windows, etc.) does not load properly*

The operating system is an extremely complex piece of software which every other item of software relies upon. It is best to leave this to a technician. If you try making any adjustments, you can easily make the problem worse. If you have recently installed any new software on the computer, this may be causing the problem. Tell the technician what the software is and give her any documentation that came with it.

6 *The program has suddenly caused a problem for no reason*

This happens with any program from time to time. If you close the program and then reopen it, the problem will probably not reappear.

7 *Whenever I use a certain piece of software, it often stops working or produces the same fault over and over again*

This is something that every computer operator has to put up with. You can find a way round this kind of problem, but unless you are prepared to learn computer programming and rewrite the program's code yourself, you cannot fix it!

Avoid using the program while any other program is running as well; there may be what is known as a conflict between the two programs. If you have recently had a new program put on your computer and a program that has never caused trouble before starts going wrong, it may be because the new piece of software is conflicting with the old program. If it an old program that has just been put onto a new computer, there may be a conflict between the computer's new operating system and the older program. Make sure that you have the most up to date version of the program; this will not only work better with newer computers, but should have had any faults in the older version fixed. Unfortunately, this works both ways; if you buy a new piece of software, it may not work well on older, out of date computers.

8 *The mouse is not working properly*

Check the connection with the computer, then give the mat and mouse a good clean. If the mouse still causes problems, the best thing is to buy a new one. Mice do not last long, are comparatively cheap, and will occasionally need to be replaced.

9 *The computer produces odd faults at random, even though it works fine most of the time. There is definitely a problem, but I can't tell what it is*

Many really tricky hardware faults appear in this way. The trouble with this sort of problem is that the computer will always work properly whenever the technician is present. Make careful notes about any fault that occurs, including the time and date, and what software was running at the time. Do not tolerate being told by a technician (and certainly not a colleague) that the fault is either imaginary of caused by you doing something silly. It is the technician's job to find the fault, not make excuses.

10 *My floppy disc won't work*

It may be physically damaged. If it is, the only thing you can do is throw it out. Make sure that your school is not buying the cheapest floppy disks available; this is a false economy. The disk must be formatted, and be of the right density. There is not space here to explain what these terms mean. It is your ICT coordinator's job to deal with this herself, or explain to you what to do.

11 *There is a problem with the printer*

In some ways, dealing with computer printers has got easier, but in other ways it has not. Certainly, getting the settings right so that the printer will work with the computer that it is attached to is a lot easier, and once it has been done, it should not cause any problems. When there is a fault with a modern printer, the software that runs the printer will give you a message telling you what the problem is. Taking the same precautions as applied to other pieces of hardware, check all leads and connections, and that the printer is switched on and ready to receive data from the computer.

Printers have become far more complicated, and need equally complex software to run them, As with other programs, this software can contain faults or conflict with other programs. Sometimes a particular program will not work with a particular printer; if this happens, check the settings in the printer options part of the program, then try closing down the program and starting it again. If this does not help, you may just have to give up using that piece of software.

Check that the lead between the printer and the computer is fairly new and of good quality. Again, buying the cheapest leads available is a false economy. When computers just sent rows of letters to the printer to print out, any old lead worked fine. Newer printers not only receive data from the computer, but send data back, and so high quality leads are essential.

12 *I think a problem may be caused by a computer virus*

It probably is not. A very small proportion of computer errors are caused by viruses. However, if you have a virus check program, it can at least set your mind at rest by proving that you do not have a virus. Decisions regarding how to protect against viruses need to be taken by the coordinator and/or the schools senior management. If staff or children are permitted to transfer files between home and school on floppy disks, then it's advisable to have some form of virus scanning software.

This brief guide is intended for the class teacher. Any problems more serious than this should be dealt with by the coordinator. She will be able to try problem software on different computers and know if overall faults are occurring throughout the school. If you are the coordinator or even the head and need to know more, there is plenty of help available. You should get help from your local authority and advisory teachers, and from MAPE publications and other organisations such as BECTa.

Regular updates of this article can be found on the MAPE web site.
www.MAPE.org.uk

The copyright jungle: some questions answered

Janice Staines **Education Officer (Primary) BECTa**

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 Do- main'. 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.

Making sense of the jargon

There are a number of terms relating to Information and Communications Technology, which are in common use yet still remain unfamiliar to many teachers. Listed below is a selection of terms and an explanation of their meaning.

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 which involves the user in solving clues or puzzles and also in collecting objects to allow progress to the next part of the adventure. *See also Model, Simulation*

CD-ROM (Compact Disc Read-Only Memory) Like an ordinary CD but can contain *words* 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 Control system, Peripheral*

Control system Control systems measure environmental changes and perform actions in response to those changes. They can be dedicated systems like a central heating system, but in school they are likely to consist of a computer, a *control interface*, *sensors* and output devices such as lights and motors.

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.

Desk-top publishing A computer application which allows the user to create page layouts which combine *words*, *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 *words* 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, *words*, *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.*

Information screens Screens of information which look like *teletext* screens. The information can be entered and formatted by the user using a computer program which emulates a teletext system. The screens of information can be accessed in sequence or it is possible for the user to link pages of related information together to allow choices to be made about the order in which screens are read. *See also Teletext, Viewdata.*

Information technology (IT) The use of machines to process information. IT includes video recorders, telephones, calculators, cash tills and computers.

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.

Keyboard overlay A sheet that is placed over the touch-sensitive membrane of an *overlay keyboard*. The overlays can contain pictures, maps, diagrams, words 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.*

MIDI interface A device which allows the interchange of signals between a computer and a music synthesiser.

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 *words* or other objects around the screen.

Multimedia A combination of *hardware* which accesses moving *images*, *graphics*, *words* 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, Robot.*

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.

Procedure Ordered and structured commands to perform a particular task. For example a *Logo* procedure for turning two lights on and off in order might be: TURNON 1 WAIT 10 TURNOFF 1 WAIT 10 TURNON 2 WAIT 10 TURNOFF 2.

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.*

Robot A mechanical device which can be programmed by the user to follow a sequence of commands. *See also Floor turtle, Programmable toys.*

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 *Technology in the National Curriculum* 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 system.*

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 program.

Spreadsheet A computer program which allows *words* 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 such as numerical series like the Fibonacci series or the management of a budget account.

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

Teletex An ordered and structured system for displaying a limited number of *information screens* on a video or television monitor which has been adapted to receive this information. The two best known systems are those used by the BBC and ITV companies: CEEFAX and ORACLE. These systems allow users to make limited choices about the order in which they view the screens. *See also Viewdata.*

Text manipulation program A term increasingly used to embrace programs which allow the manipulation, storage, retrieval and printing of words, *graphics and images.* See also *desk-top publishing* and *word processing.*

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.

Viewdata An interactive system using electronic information services that link remote computer *databases* to terminals by telephone lines, for example, a travel agent booking system. Viewdata software enables the user to construct a branching database which can be searched through the use of menus. *See also Database, Electronic mail, Teletext.*

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

IT capability self-audit

This self audit is in no way comprehensive. Neither is it expected that you will have to use all these features immediately. However, this does give a general outline of the sort of skills you will need to master at some point.

1 Connect and set up equipment	I can	Where to get help
keyboard		
monitor		
mouse		
printer		
other peripherals		
change printer cartridge		

2 File management	I can	Where to get help
access different drives		
save files		
delete files		
copy files		
move files		
name files		
rename files		

3 General skills	I can	Where to get help
load software		
open a file		
use cursor keys		
use enter/return		
use shift		
use caps lock		
copy		
cut		
paste		
print		

3a Word processing	I can	Where to get help
centre text		
bold		
italic		
underline		

change font		
insert images		
columns		
tables		
move up or down a page		
move to the start or end of a line		

3b Spreadsheets	I can	Where to get help
reference cells correctly		
alter width of columns		
enter a number in a cell		
enter a formula/function		
replicate		
select a range of cells		
create an appropriate chart		
edit cell contents		
sort data		

4. Other skills

4a Formulate questions or strategies to search efficiently for information using:

	I can	Where to get help
databases		
CD-ROM		
the Internet		

4b Control	I can	Where to get help
use correct syntax		
control directly		
write procedures to sequence events		
using sensing devices		
define conditions 'If . . . then . . .'		

4c Communicate for different audiences using	I can	Where to get help
wp		
graphics		
dtp		
sound		
multimedia		
email		
web page authoring		
fax		
computer/video conferencing		

Health and safety

Rhona Dick

MAPE takes no responsibility for any errors or omissions.

Special consideration must be given to aspects of health and safety when using computers. Some are matters of legislation others common sense. **Teachers must ensure for themselves that they adhere to requirements laid down by law or by their local authority and/or school.**

The use of any electrical equipment carries potentially fatal risks, and as teachers we must be aware of these, not only in terms of our own safety, but also that of our pupils and any other helpers. Your authority/school will have their own guidelines on whether or not children are allowed to connect up or unplug electrical equipment, **and those must be strictly adhered to**, if you are in any doubt at all then don't allow children to do it.

Here are a few simple guidelines to minimise risks.

Electrical Safety

- make your computer are a liquid free zone
- check regularly for frayed cables and damaged plugs
- secure and cover stray leads and trailing flexes
- avoid overheating, don't coil leads

Discomfort

- avoid screen glare – curtain your windows if possible
- make sure there is enough space for children and adults to gain access and work in comfort
- make sure the room is well ventilated, ICT equipment gives off heat
- noise can be distracting

RSI

Recent reports have indicated that some secondary pupils are suffering from RSI as a result of too many hours spent working at computers. While we would not want our children to sit all day in front of keyboards we must be aware that this is a potential health risk and guard against it if possible.

- ensure that the screen is at the correct height for the users – adjust as necessary
- users should be able to choose whether to have the keyboard flat or tilted
- seating should be at the correct height
- aim for good posture
- avoid user discomfort, improvise wrist rests, foot rests, chair wedges and lumbar rolls if necessary

Moving equipment

Computer equipment is heavy and can be awkward to move – try to bear in mind the following:

- don't allow children to carry equipment
- if you have to move heavy equipment try to use a trolley otherwise get help
- lift equipment properly (bend your knees)
- carry light equipment close to your body, not at arms length

MAPE

Go on-line. Check out the NGfL.	→	OFSTED reports favourably. **Well done!**	→	**START HERE**
↑				↓
Invest in new multimedia and portables. Move forward 3 spaces		MAPE . . . is a national organisation whose main aim is to encourage the effective use of information technology across the primary curriculum. MAPE . . . has registered charity status and is organised and administered by a network of enthusiastic and committed practitioners, providing members with both national and regional support. MAPE . . . provides its members with a range of publications. Every term there is a newsletter and a resource pack which focuses on one aspect of ICT. In addition there is an annual publication every January. If you would like to know more about MAPE please write to Valerie Siviter Cilgeraint Farm, St Anns, Nr Bethesda, Gwynedd LL57 4AX		Plug in computer . . . Move forward 1 space
↑				↓
Arrange INSET. Move forward one space				Corrupt disc. Miss a turn
↑				↓
ICT audit highlights some gaps. Miss a turn	←	Computer virus . . . Buy software to clear it. Miss a turn	←	Join MAPE. Move forward 3 spaces

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