

Information and Communication Technology

Effective practice in teaching and learning

Information and
Communication
Technology

Published by the Learning and Skills Network

www.LSNeducation.org.uk

Registered with the Charity Commissioners

LSN is committed to providing publications that are accessible to all. To request additional copies of this publication or a different format, please contact:

Information and Customer Centre
Learning and Skills Network
Holborn Centre
120 Holborn
London EC1N 2AD

Tel 0870 872 8081

enquiries@LSNeducation.org.uk

Copies can also be downloaded from www.keyskillssupport.net

This publication is one of a series of *Effective practice in teaching and learning* guides. There is one guide for each of the six key skills.

Printed in England by Portishead Press, Bristol

ISBN 978-1-84572-675-1

CIMS 078833GR

© The Quality Improvement Agency for Lifelong Learning (QIA) 2008

Extracts from these materials may be reproduced for non-commercial educational or training purposes on condition that the source is acknowledged. Otherwise, no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, chemical, optical, photocopying, recording or otherwise, without prior written permission of the copyright owner. Information such as organisation names, addresses and telephone numbers, as well as email and website addresses, has been carefully checked before printing. Because this information is subject to change, the Learning and Skills Network cannot guarantee its accuracy after publication. The views expressed in this publication are not necessarily held by LSN or QIA.

Contents

About this guide	1
The value of Information and Communication Technology	3
The Information and Communication Technology key skill	6
Approaches to delivery	9
Teaching Information and Communication Technology	13
Assessing Information and Communication Technology	33
Appendix 1: Developing your practice	38
Appendix 2: Resources and support	39
Appendix 3: Understanding the Information and Communication Technology standards	41
Useful addresses	

The examples in this guide assume that the learner is using Microsoft Office 2000 on a PC. They can readily be adapted for Macs or for other software. The QCA standards do not assume any particular platform or software.

About this guide

This guide is designed to provide practical advice and support for teachers who are delivering the key skill Information and Communication Technology (ICT) at Levels 1 to 3 in:

- schools
- colleges
- work-based learning
- other contexts including the secure estate and adult and community learning.

Who this guide is for

This guide is for teachers of the ICT key skill, and for teachers who are helping learners to develop the ICT key skill in the context of their specialist subject, programme or vocational area.

Specialist ICT teachers can work with colleagues who teach other subjects and programmes to:

- identify ways in which ICT can be integrated in main learning programmes
- identify ways in which specialist ICT teaching can be contextualised so as to make it relevant to learners' main programmes
- promote a cross-curricular or embedded approach to teaching ICT in your organisation.

Overview

The focus of this *Effective practice in teaching and learning* guide is on helping teachers to integrate the ICT key skill into learners' overall programmes of learning. It presents and explains a number of techniques, showing how they can be developed and applied in a range of contexts.

The guide explains the ICT key skill and suggests ideas for teaching and supporting learners. It also gives an overview of the assessment system for the key skills in general and explains the specific requirements for ICT.

This guide contains the following sections.

- **The value of Information and Communication Technology** introduces the importance of the key skill.
- **The Information and Communication Technology key skill** introduces the ICT standards.
- **Approaches to delivery** explains the main principles for teaching the ICT key skill and suggests how these may be applied in a range of settings.

- **Teaching Information and Communication Technology** is the main part of the guide. It contains ideas and guidance both about how to teach the key skill and about how to apply these teaching techniques in contexts that learners will recognise. It is organised under the headings ‘Finding and selecting information’, ‘Entering and developing information’ and ‘Presenting information’. There are also short sections on ‘Solving problems’, ‘Specific issues in the Level 3 test’ and ‘Health, safety and legal issues’.
- **Assessing Information and Communication Technology** provides an overview of the assessment system for this key skill.
- **Appendices:**
 - **Appendix 1: Developing your practice** encourages you to get the most from the guide in terms of both how your organisation delivers ICT and your own continuing professional development (CPD).
 - **Appendix 2: Resources and support** gives information about further free resources and support from national agencies and programmes.
 - **Appendix 3: Understanding the Information and Communication Technology standards** will help teachers who are new to the ICT key skill to interpret the key skills standards.

Further advice and information

- If you need further advice on the specific assessment requirements for the qualification, you should refer to your awarding body. Assessment is the responsibility of the awarding bodies who provide detailed documentation and specialised training.
- For information or resources on the development of schemes of work or on how to write assignments that develop and/or provide evidence for ICT, please see other publications from the Key Skills Support Programme (KSSP) at www.keyskillssupport.net or the QIA Excellence Gateway <http://excellence.qia.org.uk>
- Earlier good practice guides specifically for school and college staff and for work-based practitioners are still available on the KSSP website at www.keyskillssupport.net (see Appendix 2, p39) or from the QIA Excellence Gateway <http://excellence.qia.org.uk>
- For detailed advice and guidance on interpreting the key skills standards, you should consult the QCA guidance document detailed below.

Throughout this guide, the term ‘QCA guidance’ refers to *The key skills qualifications standards and guidance: communication, application of number and information and communication technology – levels 1–4* (QCA, 2004; ref QCA/04/1272). This is available from QCA Publications (tel 08700 606015) or via the QCA Orderline <http://orderline.qca.org.uk>. It can be downloaded from the QCA website www.qca.org.uk

The value of Information and Communication Technology

The focus of the Information and Communication Technology (ICT) key skill is on using and applying ICT in learning, in work and in life. The emphasis should therefore be on helping learners to identify opportunities to use ICT in their programme of study, in workplace activities, and in relevant contexts from everyday life.

Helping your learners with the key skill of ICT will therefore have considerable benefits for them, both now and in their future lives. It can provide them with some of the competencies and attributes needed for effective participation in further and higher learning, employment and adult life and help them to:

- develop a range of transferable skills such as the ability to use technology to find, use, process and develop information, and present the outcome of their work
- increase their self-confidence and their ability to work independently
- reflect on their own learning and performance
- enhance their levels of achievement in other areas of work
- develop their confidence in working with ICT.

In schools

The revised secondary curriculum makes it clear that learners need to apply their ICT skills beyond their specialist ICT lessons. Learners can use ICT to research information, write essays, projects, reports and coursework, make presentations, create artwork, collaborate with other learners in other centres, including overseas, and in many other ways. Many courses benefit from the use of ICT and, when subject teachers help learners to use their ICT skills in context, this can help to improve achievement.

Experience and knowledge of the ICT key skill will stand schools in good stead as they prepare for the introduction of functional ICT in 2010. Candidates will be required to achieve Level 2 in functional ICT if they are to be awarded grade C or above in GCSE ICT, and Level 2 functional ICT will be a requirement for achievement of Higher and Advanced Diplomas. The draft standards for functional ICT are available at a range of levels. They are derived from the ICT key skill standards, the adult ICT standards and the appropriate National Curriculum levels for ICT.

The draft standards for functional ICT can be downloaded from www.qca.org.uk/qca_6066.aspx

The ICT key skill provides a way of helping learners to gain a nationally recognised qualification while improving their ICT skills. It could also demonstrate a school's active commitment to Every Child Matters.

ICT qualifications – like the other key skills – are assigned points that contribute to the Achievement and Attainment Tables in secondary education. ICT is worth 18.8 points at Level 1, 34.5 points at Level 2 and 63 points at Level 3. For comparison, a grade D GCSE is worth 34 points.

In work-based learning and further education

Many of the opportunities to use ICT in schools also apply to general education programmes in further education (FE) and sixth form colleges.

In addition, the ICT key skill forms part of the framework for many Apprenticeships. Providers often find that apprentices respond well when ICT is integrated in the learning and training for their chosen vocational area. It enables learners to see the potential of ICT and to appreciate the importance of its use in a wide range of occupations. Setting ICT in context often motivates learners to master skills they have struggled with previously.

In higher education

ICT is used in virtually every course in higher education (HE). Many HE institutions (HEIs) expect students, on arrival, to have the skills to enable them to search for ICT-based information, process and develop it using software applications, and present the results. In many cases, HEIs have to provide remedial 'crash' courses for students who have not mastered these skills. Students who arrive in higher education with these skills are therefore at a clear advantage.

In employment

Virtually all working environments today involve the use of ICT in some form. However, so much of this is taken for granted that employees are almost unaware of it, at least until they find that they lack the knowledge and understanding to operate systems effectively. There is an ever-increasing need for workers at all levels in organisations to have appropriate levels of ICT skills and, in particular, to be able to cope with rapid advances in the technology. The emphasis of the ICT key skill is on the application and transferability of the skill, which makes it particularly appropriate to the world of work.

The ICT key skill is included in the UCAS tariff. The qualification is assigned a value of 10 tariff points at Level 2 and 20 tariff points at Level 3.

In life

A notable aspect of ICT is the speed at which new ways to use and apply information and communication technology continue to increase. It is amazing to consider that the internet is only about 30 years old – and its widespread use can realistically be traced back over only the past two decades. Today, we have all been touched by the computer revolution and over 60% of UK households have access to the internet, with over 80% of users saying that their main activities are searching for goods/services and communicating via email (source: Office for National Statistics, August 2007). The explosive growth of social networking in the last two or three years is only the latest example of these innovations.

At the same time, however, there is growing evidence of a ‘digital divide’ between those who have access to and are comfortable with ICT and those who are not. This divide has been compared to that between those who are literate and those who are not, with all the disadvantages that that implies. There are also the wider ICT issues that all citizens need to understand, including identity theft, personal safety, cyber-stalking, hacking and virus protection. Young people are often the most ICT-literate in the context of, for example, social networking, but they may be relatively naïve about these wider issues.

The Information and Communication Technology key skill

This section provides an overview of the ICT key skill. If you are relatively new to the key skill, you may wish to go now to **Appendix 3: Understanding the Information and Communication Technology standards** (p41), which gives more detail. When working with learners, you will also need to be familiar with the standards themselves and the QCA guidance.

Where the standards for the key skill Information and Communication Technology, at every level, refer to 'information', this can take the form of text and/or images and/or numbers.

For more detail about progression through the levels, see the QCA guidance p75.

ICT is the key skill that enables learners to use ICT to find, explore, develop and present information (text, images and numbers).

The emphasis is on the **selection** and **application** of ICT skills in ways that are appropriate to a particular context. At each level from 1 to 3, the ICT standards consist of the same three steps:

- find and select relevant information
- enter and develop the information to suit the task
- present the information.

Progression through the levels

As learners progress through the levels of ICT, they are expected to:

- draw on more complex and a wider range of techniques
- take a more active role in the planning process
- take more decisions and, at Level 3, justify their methods.

Level 1

At Level 1 candidates are required to handle simple numerical, textual and graphical information in the context of short, straightforward tasks, using basic techniques.

Candidates should know how to use technology safely, care for equipment and avoid losing data. They should also know how to send and receive email and who they should turn to if things go wrong.

Level 2

At Level 2 candidates are required to carry out effective searches and derive new information. They must also present combined information, such as text with images or numbers, in a consistent way. Activities require a greater range of techniques, and more steps, than at Level 1. Candidates need to observe copyright and confidentiality laws and be aware of health and safety risks. They should be able to spot errors and their causes and be aware of ways of reducing the risk of viruses. They should also know how to send and receive email.

Level 3

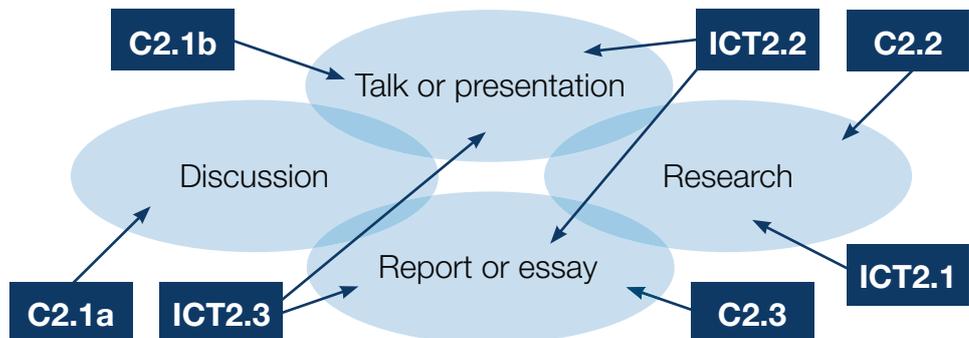
At Level 3 there is an increase in the complexity of activities and techniques required, such as the ability to create structures and procedures for developing text, images and numbers. Candidates are required to plan and carry through at least one major task. They must know how to manage their work and the technology and software they are using. This includes observing laws of copyright and rules of confidentiality; safe working and avoiding loss of information; identifying errors; and minimising risks from viruses. Candidates need to be aware of the wider implications of using ICT. They should also know how to send and receive email with attachments.

The focus is on a critical approach, requiring candidates to make judgements about their work, in terms of speed, ease of use, effort and accuracy, and compare their use of ICT against other systems and manual methods.

Links with other key skills

ICT links with the other key skills. There are very strong links with Problem Solving – indeed, the Level 2 and Level 3 Problem Solving key skill gives a structure to ICT at Levels 2 and 3 and could do so at Level 1 as well. Learners can link many of the ICT and Communication skills – for example, developing PowerPoint slides and images to support a short talk or presentation or use their discussion skills to develop their understanding of ICT.

Almost all courses require learners to do some finding out and then either write about it or give a talk. The diagram below shows, for example, that as learners apply their ICT skills to these tasks at Level 2, they can generate portfolio evidence for the ICT key skill but also for the Communication key skill.



Other opportunities for linking the key skills include the following.

- Researching the cost of an item and producing a letter to recommend purchase could develop ICT, Application of Number, Communication and Problem Solving skills.
- Researching into river flows, soil samples, etc for geography could develop ICT, Application of Number, Communication, Working with Others and Problem Solving skills.
- Developing ICT skills can form a focus for Improving Own Learning and Performance.
- In some centres learners are preparing 'e-portfolios' for a range of qualifications, including the wider key skills.

It is worth noting that learners working with ICT at any level may not necessarily be operating with a comparable level of literacy and/or numeracy skill. You need to be aware of this to ensure that there are no barriers to their reading and understanding information they may work with in an ICT context, such as Help files, spreadsheets or web information.

Approaches to delivery

How you design your ICT programme will depend on the context you are working in and the needs of your learners. Whatever your context, the central principles for teaching all the key skills are:

- embedding and integrating learning with other subjects and activities wherever possible
- personalising learning so that each learner is offered an individual programme with opportunities for progression
- using active learning methods to maintain motivation by ensuring that skills are applied in real and relevant contexts
- encouraging collaborative learning wherever possible.

Embedding and integrating

ICT becomes meaningful and motivating for learners when:

- it is related to their own purposes and needs
- they can see an instrumental reason for learning
- the development and application of the ICT skills are integrated with other subjects, workplace activities or wider interests.

Embedding or integrating the key skill in a learner's overall programme will help to ensure that their work on ICT will also contribute to their other achievements.

Some providers use an embedded approach where learners develop, practise and apply their key skills in the context of their main programme of learning. Key skills development opportunities are planned and signposted in the scheme of work and in lesson plans. The key skills are taught either by main subject teachers or by key skills specialists, sometimes through team teaching. There is no separate timetabling of key skills but learners may be offered additional support (eg through workshops or tutorials), including for building portfolios. Providers in research conducted by KSSP often described themselves as using an 'embedded' approach, but this can carry the risk that the skills are embedded to the extent that they are virtually invisible to learners.

Other providers 'contextualise' their key skills teaching. Here, key skills specialists deliver key skills in timetabled sessions but the key skills specialists liaise with main programme tutors to ensure that the examples and contexts used in these sessions are relevant to learners' main programmes of learning. The specialists also offer support for building portfolios.

It is essential to devote time to teaching the skills of ICT explicitly. Learners do not develop the skills by osmosis. They must develop the understanding and skills involved in order to complete all the assessment requirements successfully. The section 'Teaching Information and Communication Technology' (p13) looks at some ways of doing this.

The pattern of delivery that you adopt will be guided by the needs and strengths of your own organisation. Whatever model you adopt, you will need to liaise effectively with all those involved in the learning process to ensure that learners are given opportunities to develop their ICT skills. Team teaching can be valuable for all involved.

Subject and programme leaders will need to plan the delivery of key skills with their teams. Vocational and subject teachers should work closely with ICT teachers and, where appropriate, learning support or classroom assistants to advise each other and share resources.

Employers and workplace mentors will need to liaise with vocational teachers and assessors to help identify skills opportunities and support workplace skills development.

Personalisation

Personalisation is important because, while it is not a new idea, there is a drive to make it common across all schools, further education and work-based learning. Personalised learning programmes can bring benefits in terms of:

- more motivated learners
- meeting individual and organisational targets
- offering meaningful and enjoyable learning
- offering stretch and challenge.

The starting point for personalising learning is to establish each learner's existing skills and abilities. In a school you will already have much of this information but in work-based learning, colleges, the secure estate and other settings, learners will be new to you and you will need to carry out some form of initial assessment. There is a range of methods you can use, including self-assessment, discussion and structured activities.

For more information on initial assessment, see the *Initial assessment toolkit for key skills and Skills for Life* (KSSP, 2006), detailed in Appendix 2 (p39).

This information is used to help learners set individual learning targets. Teachers then work on a one-to-one basis to help learners review their progress, reflect on their learning and set further targets.

Active learning

Active learning means finding better ways of engaging learners in the learning process. Active learning is dynamic and involves giving learners experiences and activities that allow them to do things and engage in dialogue. Because key skills are about applying skills and knowledge, they already embody an active learning approach.

Learners who are actively involved in their learning are more likely to retain skills and knowledge and to gain an understanding at a 'deep' rather than 'surface' level.

Encouraging learners to become active learners using a variety of ideas promoted in the 'Teaching Information and Communication Technology' section of this guide (p13) will enhance their learning, enliven them and actively engage all their senses rather than just their eyes and fingers. This could involve using card activities, quizzes and games. You could also set group challenges, have simple discussions and promote learners' roles and responsibilities in projects. Learners could use visualisation techniques and experiential learning, and work with real rather than mock data. It could also mean getting learners drawing, planning, compiling mood boards or storyboards, working away from the computer, using Interactive Whiteboard Technology (themselves instead of you), or cooperating with people they wouldn't usually work with. All these approaches have been proved to be both effective and challenging to learners. In addition to actively engaging them in the process of learning, active learning boosts learners' confidence and encourages them to become more independent and to take an increasing degree of responsibility for their own learning.

Collaborative learning

For many young people, using ICT is primarily a social activity, through texting, sending email, social networking, and sharing images from digital cameras and mobile phones. It should therefore be a short step to encouraging them to engage in collaborative learning of a wider range of techniques and technology.

Many learners find that working with a fellow learner is a very helpful way to explore the potential of the technology and to share and reinforce learning. There is seldom only one way to tackle an ICT-related task, and collaborative learning helps to prevent the situation where a learner continues to use an inappropriate technique simply because it has not occurred to them to try anything else. Working and discussing with a peer helps learners to understand:

- what words, icons and symbols mean
- how different software applications relate to each other
- why particular methods work
- why a method is not working
- how to tackle problems more effectively

and to be more imaginative and creative in finding efficient and effective ways to use the technology.

By engaging in discussion and explaining their ideas, challenging and teaching one another, asking questions and answering each other's questions and working collaboratively to share their results, learners not only improve their ICT skills but also become more confident and effective learners.

Research by Swain and Swan (2007) suggests that many learners enjoy working collaboratively; they feel less vulnerable and more relaxed when they work towards making a shared decision. They also feel that they learn from each other, particularly when they need to explain their thinking.

Here are some ideas for activities that lend themselves particularly well to collaborative learning.

- Ask learners to work together to explain particular techniques by producing a poster or explaining what they have learnt to a peer.
- Ask a learner to 'teach' a point, or even a short topic, for revision.
- Encourage discussion and collaborative work when teaching ICT.
- Ask learners to buddy up to support each other.

However, collaborative working is not a panacea. It can often be difficult to keep younger learners 'on task' when they are working without the direct supervision of a teacher. Also, research by the National Research and Development Centre (NRDC) suggests that adult learners who spent more time working on their own showed better gains in ICT skills (though not ICT confidence) than those who spent more time working in small groups. The research also suggests that, when collaborative work is forced by the need to share technology, it is less successful than involvement in tasks that require peer interaction. It is therefore important to recognise that the time spent on collaborative learning needs to be carefully balanced with time spent on individual learning.

You may need to set ground rules for learners if they are unused to focused, task-oriented discussion in ICT, to help create a supportive and encouraging environment where everyone feels able to participate. There is material on this in *Effective practice in teaching and learning: Working with Others* (KSSP, 2008).

Teaching Information and Communication Technology

There are KSSP 'How to' worksheets on various administration activities that are relevant to the teaching and learning of ICT.

This section of the guide contains ideas and guidance about how to teach the ICT key skill and how to apply these teaching techniques in contexts that will be familiar to learners. It is organised under the headings:

- **Finding and selecting information**
- **Entering and developing information**
- **Presenting information**

which follow the structure of the Part B components. There are also short sections on:

- **Solving problems**
- **Specific issues in the Level 3 test**
- **Health, safety and legal issues.**

The examples in this guide assume that the learner is using Microsoft Office 2000 on a PC. They can readily be adapted for Macs or for other software. The QCA standards do not assume any particular platform or software.

Resources from the Key Skills Support Programme particularly relevant to teaching ICT are signposted in this section. They include *Level crossing: progression from Skills for Life to key skills* (KSSP, 2006), referred to as *Level crossing*, and ICT 'How to' worksheets for learners. See Appendix 2 (p39) for more information.

Finding and selecting information

There are KSSP 'How to' worksheets relevant to finding information and using information sources.

Learners should know how to find different types of information for a particular purpose, including from non-ICT sources, and select what is relevant and appropriate. At the higher levels they need to be able to select and interpret information appropriately for their purpose.

- **At Level 1** learners must 'Find and select relevant information.' They need to know how to 'find different types of information from ICT sources ... and non ICT sources' and 'select information relevant to your purpose'.
- **At Level 2** learners must 'Search for and select information to meet your needs.' They need to know how to 'identify suitable sources of information', 'search for information using multiple search criteria' and 'interpret information and select what you need for different purposes'.
- **At Level 3** learners must 'search for information, using different sources'. They need to know how to 'plan and organise your work', 'select sources of information which are suitable for your purpose' and 'choose appropriate search techniques for finding information efficiently'.
- **At Levels 2 and 3** they must use multiple search criteria in at least one case.

To introduce the subject of finding and selecting information, there are some key questions to ask learners. For example:

- How do you decide where to start looking?
- Why do you use a particular search engine?
- Is the information you have found of high quality?
- Is the source reliable?
- How current is the information?
- How do you make judgements about the different information you find?

Identifying sources of information

Listing sources



- First, encourage learners to think about where they can find information from within the organisation they attend and as part of the courses they are studying.
- Next, ask them to consider which external organisations might provide them with information.
- Now ask them to create a list of specific sources of information. Ask them to identify which of these are available as ICT-based sources, which are available as non-ICT-based sources and which are available in both forms.

Checking the quality of information

Encourage learners to think of ways of looking critically at the information they find. At all levels learners are required to search for information for a specific purpose. In order to check the quality of the information they find, encourage your learners to use the following checklist.

Quality information is:

- **clear** – easy to understand
- **accurate** – free from errors and bias
- **relevant** – meets needs/purpose
- **current** – contains up-to-date information
- **reliable** – comes from a trusted source.

Using appropriate search engines

Most ICT users tend to stick to using the default search engine presented to them when they first log on to the internet. By trying a range, they will discover that different search engines yield different results. The aim of the next activity is for learners to evaluate search engines and be able to list the advantages and disadvantages of each one.

Comparing search engines

Challenge your learners to name as many search engines as they can. Suggest that they then try carrying out the same search using three different search engines to find the answers to the following questions.

- In what year was the first Comic Relief fund-raising campaign?
- Who scored the first goal in the 1966 World Cup final?

Ask your learners to feed back on the differences they observed. For example:

- How easy was it to find the information required?
- How many 'hits' resulted from the initial search criteria?
- Were the first 10 hits the same on all search engines? If not, how did they differ?
- Did all the sites searched provide the information required?
- How easy was it to refine the search within each different search engine?

Showing the search criteria used and the results of searches can be easily evidenced using screen shots. Encourage learners to annotate their screen shots to indicate the keywords they used, how they refined their search, which sites they visited and what information they found.

Using keywords and search criteria

This is an opportunity to introduce the concept of 'keywords' and 'search criteria'. The purpose is to show how providing labels helps to find images that meet your search requirements.

Creating keywords

This activity assumes that there are at least 12 learners in your group but it can be adapted for smaller numbers. Your learners will be divided into small groups or pairs.

You will need to prepare 30 cards, each with a different image printed on it. Make five cards for each of six subjects (eg transport, buildings, sports).

- Divide your group of learners into six pairs or small groups.
- Give each pair or group the five cards belonging to the same category. Ask them to agree a single word that could be used to categorise broadly all the images in their set (eg transport), and write the word on the back of each card, at the top.
- Ask each pair/group to pass one of their cards to each of the other five pairs/groups. They should now add a sub-category to each card (eg bus).
- Repeat the labelling and passing-on process with each subsequent pair/group adding a different word or category at a further sub-level (eg double-decker, red, London).
- When every card has at least five keywords written on the back, place all the cards face down on a table.
- Ask each group of learners to locate all the image cards that match a single search criterion (eg transport). Get them to discuss the sub-categories to emphasise how a single criterion is likely to result in a number of 'hits' but how a more specific search using keywords will result in fewer and more appropriate hits.
- Explain to your learners that image libraries use keywords to classify images and (in the case of the internet) enable them to be retrieved when the keywords are entered into a search engine.

To practise using keywords and search criteria you could use 'Understanding wild card searches' (Challenge 4) from *Level crossing*.

At Level 2 and above learners are required to demonstrate their ability to use multiple search criteria.

Using multiple search criteria



- Ask learners to use a search engine to search for information about weather maps by entering the information in the formats shown below:
 - weather maps (entered in lower case with no speech marks)
 - weather and maps (entered in lower case with no speech marks)
 - “weather maps” (entered in lower case with speech marks)
 - “weather and maps” (entered in lower case with speech marks).
- For each of the four searches, ask learners to make a note of how many hits were achieved, and if there were any differences in the top 10 hits.
- Ask them to discuss why any differences occurred, and what can be learnt in terms of making other internet searches more effective.

Searching other ICT-based information

Further examples of grasping the meaning of search functions can be found in Challenge 3 of *Level crossing*.

When carrying out searches within databases and spreadsheets (eg to search for records containing a certain date), learners will need to be able to use **relational operators**.

At Level 1 learners should be familiar with:

- = equal to
- > greater than
- < less than.

In addition, at Levels 2 and 3 learners should be familiar with:

- >= greater than or equal to
- <= less than or equal to
- <> not equal to.

See the worksheet ‘How to find information’.

In order to carry out effective multiple criteria searches at Level 2 and above, learners also need to be familiar with the use of **logical operators** (eg AND, OR and NOT). These can be used for searches such as:

- list all people who are female AND aged over 20
- list all cars that are coloured red OR blue
- list all menus that do NOT contain wheat.

Don’t forget to point out to learners that sometimes we have to think very carefully about the way we use logical operators to structure a search. For example, if you were looking for a second-hand car that is either red or blue, you would probably ask the dealer to show you ‘all the red and blue cars’. However, when searching a database, you would need to use the criteria **colour = red OR blue** in order to get the desired result.

Entering and developing information

There are a number of 'How to' worksheets on entering information.

Learners have to know how to enter text and numbers and be able to copy text, images and numbers. At the higher levels tasks should become increasingly complex and require the learner to make judgements about adapting the structure and format of information appropriately.

- **At Level 1** learners must 'Enter and develop information to suit the task.' They need to know how to 'enter information ... using formats that help development' and 'develop information in the form of text, images and numbers'.
- **At Level 2** learners must 'Enter and develop the information to suit the task and derive new information.' They need to know how to 'enter and combine information ... using formats that help development', 'develop information in the form of text, images and numbers', and 'derive new information'.
- **At Level 3** learners must 'Enter and develop the information and derive new information.' They need to know how to 'enter information in consistent formats', 'use software features to improve the efficiency of your work', 'create and use structures and procedures for developing and combining text, images and numbers' and 'derive new information'.

Your own learners may well be using a wide range of software applications in order to demonstrate their skills. Some might be developing posters and brochures, some creating interactive presentations, some generating graphs to illustrate statistical data, some analysing the results of a piece of research, and others creating web pages.

Clearly, it is impossible to cover here the full range of ICT skills and techniques required to achieve such a broad range of outcomes. Therefore, this section focuses on generic skills and techniques that can be developed with different groups of learners (ie those working within school, college, leisure and work-based environments), applied across a range of applications and used in a wide range of contexts.

Organising information

To enable learners to practise further ways of sorting data you could use the activity in ICT Challenge 13 from *Level crossing*.

No matter whether the outcome is printed, shown on screen or projected for viewing by a wider audience, learners at all levels need to be able to develop a clear structure for their work. There is often a fairly logical sequence for the development and presentation of information, but it may take some time (and considerable thought) for this to become clear in a learner's mind. Use the strategies below to help learners organise their information.

- Show them ways to work out sequences, like reordering a list, numbering the points on a diagram, drawing a flow chart or imagining that they are giving someone step-by-step instructions.
- Find examples of documents that the learner is familiar with and, together, identify the features that make the structure clear (eg introductions, headings, page breaks, contents lists). Encourage them to use these features in their own ICT work.
- Ask learners (particularly those in vocational and work-based environments) what they know about 'house styles' and how these are used for presenting reports and other documents.

Looking at documents



Ask learners to collect examples of different types of documents (eg business letters, utility bills, magazine articles, advertisements, reports).

Divide them into small groups and ask them to identify key elements for each group of documents.

- Identify the similarities and differences in the documents they are looking at.
- Look at the layout – how much white space is there on the page?
- Compare the layout of information in different examples of the same type of document. For example, learners may have been told that a business letter should have the sender's and recipient's addresses in particular places. Is this the case in the letters they are looking at?
- What images/graphics are used on the documents?
- What fonts are used?

Asking groups to build on what they have discovered by creating a house style for a small range of documents (eg a letter, a flyer and an invoice/bill) provides a great opportunity for learners to practise and develop both their individual and cooperative ICT skills.

This activity can be carried out using Word or PowerPoint.

However, there is always a risk that learners will become over-concerned with the content of the document rather than with its organisation and presentation. A simple and well-known trick here is to give learners a block of 'mock' Latin text with English headings all in the same font (see the example overleaf), along with a small range of pre-prepared images. In this way the content becomes meaningless so learners can focus on entering, organising and developing the information, using a consistent style and layout, rather than tinkering with the content.

Summary

In vel feugait dolore ut tation ullamcorper, luptatum minim feugait et suscipit in iusto nulla in consequat ullamcorper elit dui. Vel eros ad eu zzril feugiat et vero vero.

Introduction

Feugiat sit vulputate iusto aliquip lobortis consectetur consectetur eros, ad, autem veniam hendrerit, laoreet te. Duis, nulla volutpat lorem wisi eum euismod delenit ...

You can find examples of suitable copyright-free material by entering “Latin text” into a search engine, or by using a fake Latin text generator.

Combining information

At Levels 2 and 3 learners need to be able to combine data from different sources. For example, if the learner is summarising work that has been carried out using a database and spreadsheet, they could combine the various elements by bringing them together in a single report. This could be done by creating the report using a word-processing package and then inserting tables and charts from the spreadsheet application along with tables and the results of queries from the database application. However, because not all ICT-based information can be cut and pasted, in order to be able to create their report, learners will need to be familiar with the procedures for exporting information from one application into another.

Combining data from different applications

You can take this in stages from simple to more complex activities.

Inserting information into a word-processed document

Ask learners to copy and paste a selection of text, images and numbers from a range of applications including:

- text from one document to another
- merging text
- spreadsheets
- images from the internet.

More advanced learners may wish to try this activity in PowerPoint.

Combining information from web pages

When they copy information from web pages, learners need to be aware of alternative ways to copy and paste information, such as using drop-down menus, right clicking and using the **Cut**, **Copy** and **Paste** icons. They should also know how to remove hyperlinks.

Inserting information from a web page

- Ask learners to select a web page that they want to copy information from and to practise copying text from the web into a new Word document. Encourage them to use the right mouse button to select the edit functions rather than using the icons on the toolbar.
- Next, ask them to open a web page that contains hyperlinks and to highlight a section of text that contains a hyperlink. Copy and paste this into Word.
- Explain that they can remove the hyperlinks by placing the cursor over the linked item in the Word document and using the menu generated by the right mouse button. Encourage them to practise and experiment with this.

When practising inserting information from web pages, it is very important to make learners aware of their responsibilities in terms of observing copyright and avoiding plagiarism.

Copyright material on the web

Ask your learners to look at a variety of web pages and identify the copyright issues that apply to each page by considering the following questions.

- Is the source of information credited to an author or organisation?
- Is it dated?
- Does it give any copyright details?
- Does it show any links to other websites that may give the original source?
- If you were going to use this in a piece of writing of your own, how would you acknowledge the source?
- If you copied a section of the page to put in your own work without attribution, would this be plagiarism?

Encourage your learners to consider the difference between copying a paragraph to look at again later (ie once development starts) and pasting the same paragraph into a document of 'their own'.

Learners can make effective use of screen shots when generating evidence. Remember, a picture paints a thousand words, and a well-annotated screen shot can provide concise and effective evidence of learners' skills.

Presenting information

There are a number of 'How to' worksheets relevant to presenting information.

In presenting information, learners need to ensure consistency in formatting (eg consistent font style and size, number formats, headings and text emphasis). Accuracy is important at all levels, so learners should demonstrate effective proofreading.

- **At Level 1** learners must 'Develop the presentation so that the final output is accurate and fit for purpose.' They need to know how to 'use layouts and techniques to suit different purposes' and 'present information in a consistent way ... making sure it is accurate and clear'.
- **At Level 2** learners must 'Present combined information such as text with image, text with number, image with number.' They need to know how to 'select and use layouts and techniques to suit different tasks', 'develop the presentation to suit your purpose and audience and the types of information used, ie text, images and numbers', and 'present information in a consistent way'.
- **At Level 3** learners must 'Present combined information such as text with image, text with number, image with number.' They need to know how to 'develop the structure of your presentation', 'develop and refine your presentation by combining text, images and numbers', and 'present information so that it meets your purpose and the needs of the audience'.

Exploring different approaches

In a similar way to the activity carried out to explore entering and developing information, encourage learners to look at a range of documents and identify:

- which documents look appealing, and what makes them effective
- which documents are less appealing, and why this is
- how they could incorporate the elements that they have identified as making documents look appealing into their own ICT work.

Encourage learners to consider different approaches to presenting the same information.

Presenting a document

- Issue learners with a pre-prepared document with all the headings, subheadings and text in the same size Courier font. You could include a couple of images if you feel it is appropriate.
- Ask them to use their ICT skills to present the document in three different ways, spending a maximum of 10–15 minutes on each version.
- Once completed, ask the group to look at all the documents they have created, to identify the best half-dozen and to discuss what features of the selected documents make them more attractive/fit for purpose than the others.
- Rather than drawing attention to the work of learners who have struggled with this task, ask a few of those who are comfortable evaluating the quality of their own work to explain what they feel is wrong with their own 'worst example'. In this way, discussions about negative aspects of presentation can be initiated without individuals feeling that they are being criticised.

Remind learners that, when they are creating a graph or chart, the reader should be able to gather all the necessary information from it without having to look at the spreadsheet it is based on. It should be a stand-alone image that speaks for itself, so it needs to be correctly titled and labelled.

Key features in presenting information

Features that contribute to the successful presentation of documents include:

- page orientation
- headings
- fonts
- images
- tabs
- tables – indentation, bullets and numbering
- alignment
- columns
- page breaks
- headers and footers
- show/hide.

See 'How to use margin, indents and tabs'.

Getting to know the presentation features

Provide learners with a handout showing screen shots of the icons or short cuts for the functions listed above. Ask them to annotate the list with the function of each one. They can then practise using them by applying them to some existing text or by creating new text, as appropriate.

You may find the worksheet 'How to use styles and templates' useful for your learners.

Using styles

Paragraph styles are a way of saving and reusing formats, headings, text, bullets, and so forth. They can be used to determine font, text sizes and formats, indents, numbering layouts, and the space between paragraphs. Level 2 learners should know how to apply existing styles; Level 3 learners (who are expected to be able to customise automated routines) should be able to edit or create styles of their own.

Using templates

Having spent a great deal of time setting up styles for a particular type of document (eg a newsletter), it can be a time-consuming exercise to recreate it. Indeed, it makes little sense to start the next newsletter with a blank page and have to set up styles all over again. Learners can use documents they have developed to create templates containing predefined layouts and styles, which will help them to create similar documents in the future. This can be done by using the **Save As** option in the drop-down **File** menu, and changing the default **Save As Type** option to **Document Template**.

Checking accuracy

ICT Challenge 14 in *Level crossing* covers the topic of improving the final presentation of a piece of work.

No matter how well a document is presented, spelling and grammatical errors will have a considerable effect on the way a reader responds to it and (if it contains more than a few minor errors) may well render the document unfit for purpose. Learners need to be able to:

- use automated spellchecker facilities – including setting the spellchecker to the correct language version by using the **Language** option in the drop-down **Tools** menu
- proofread their work to identify and correct obvious errors
- seek feedback on ways in which the content of the document might be more easily understood if elements were rearranged (eg switch the sequence of two paragraphs, change the location of an image, reorder a set of bullets)
- ask others to check their work for errors the learner may have missed – it is very often the case that someone who has written a document will miss errors (even though they have checked it several times).

Keeping annotated drafts or copies of earlier versions is a good way to provide evidence of checking. Likewise, keeping notes of the advice received and/or copies of any emails from people who have given feedback is a good way to provide evidence of taking account of the views of others.

Solving problems

Although problem solving is not an explicit assessment criterion in the ICT key skill, to become really proficient in using ICT, all learners need to know what to do when they encounter a problem.

- **At Level 1** learners need to know how to 'get help when dealing with errors'. Their ICT problem-solving skills are likely to be fairly basic so they will have a heavy reliance on asking others for support.
- **At Level 2** they need to know how to 'identify errors (*eg in hardware and software you are using*) and their causes'.
- **At Level 3** learners are expected to have a degree of autonomy and they ought to be able to apply a significant degree of independence in order to solve more complex problems.

It makes little sense for learners to waste valuable working time wandering around buildings looking for someone to help them. It therefore clearly makes sense to ensure that one of the first things covered within any programme of learning for ICT is how to obtain support.

Using human support

Learners need to know **who** to approach if they encounter problems when using ICT (subject specialists, teaching assistants, technicians, network managers, etc), **where** those people may be found and **when** they are available.

While your organisation may contain only a small number of trained ICT personnel, don't forget that there are many non-professional individuals who may be in a position to offer learners support in solving problems.

To start with, there are your colleagues. An increasing number of teachers, lecturers, trainers and assistants now feel confident enough to offer support in a widening range of ICT situations.

However, many practitioners fail to make use of the biggest human resource available to them – other learners. As discussed earlier, peer learning is an incredibly powerful way of helping learners move forward. Encouraging learners to talk to each other and to help each other solve problems also takes pressure off trained staff and enables them to focus on issues of progression rather than spending much of the time 'fire fighting'.

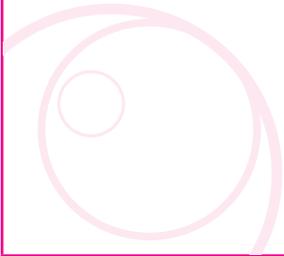
Nevertheless, don't forget that learners should be encouraged to attempt to resolve problems themselves before turning to others for support. The more independent learners are in terms of problem solving in the ICT key skill, the more likely it is that they will become autonomous and effective learners.

Using on-screen Help facilities

Most software applications include an on-screen **Help** facility. In most cases this is available as an option on the menu bar, in some cases as an online web facility, and in other cases as a combination of both.

It is surprising how many learners ask other people for help without having checked out their on-screen Help facilities. Remind learners that the human support that may be available while they are at school, college or work is not always going to be there, particularly when they are working at home or in small business settings. Encourage them to learn how to use the on-screen Help facilities effectively by setting them simple tasks that they can use to practise. The following activity gives some examples.

Using 'Help'



Ask **Level 1** learners to use **Help** to find out how to:

- set the height of a row in a table
- edit an image.

Ask **Level 2** learners to use **Help** to find out how to:

- edit a 'style'
- password-protect a document.

Ask **Level 3** learners to use **Help** to find out how to:

- add and edit electronic 'comments' to a word-processed document
- adjust a formula in a spreadsheet to show an average rather than a total.

Unlike internet searches (which might bring up a huge range of possible solutions), using the on-screen Help facilities sometimes results in a list that bears little resemblance to the original enquiry. You must therefore make sure that learners are aware that they may need to try out several lines of enquiry, modify their search criteria and use a fair degree of lateral thinking in order to obtain the result they are looking for.

Specific issues in the Level 3 test

As the Level 3 tests require candidates to carry out practical tasks, there are some skills that all Level 3 learners need to develop, even if they do not need to use them when producing evidence for their portfolios. One simple example is that, in taking the test, learners will need to know how to import the data provided by the awarding body. This is part of the assessment criteria for which marks are awarded, so learners need to be confident with this skill.

Displaying formulae in a spreadsheet

When carrying out spreadsheet tasks in Level 3 tests, the majority of marks are allocated for the processes the learner uses rather than the outcome of what they do. This means that, if a learner does not clearly show the formulae/functions used to achieve a result, they are likely to miss out on a significant number of marks. Given that the use of some formulae/functions (such as IF/AND, IF/OR, VLOOKUP) is worth up to 20% of the total marks, failure to include a formula printout (even though the learner might have carried out the tasks successfully) could jeopardise their chance of passing the test.

In most spreadsheet packages, formulae can be displayed by selecting **Options** in the drop-down **Tools** menu and activating the **Formula** button.

In certain cases, examiners are unable to allocate marks unless they can identify the specific location of a formula or function (eg cell D4). Therefore, Level 3 learners should practise producing formula printouts that show fully displayed formulae (which might require them to adjust column widths), as well as grid lines, and column and row headings.

Printing specific areas of a spreadsheet

Learners are often required to print specific areas of a spreadsheet (eg cell range B3:G12). In order for examiners to allocate marks for this, they need to see evidence of the cell range shown, so learners need to ensure that these types of printout include column and row headings, and preferably grid lines also.

This can be achieved in most spreadsheet packages by selecting **Page Setup** in the drop-down **File** menu and activating the **Gridlines** and **Row and column headings** buttons.

Note that in some cases selective formula printouts are requested. These require the learner to produce a formula printout showing a defined cell range.

Hiding columns and rows on spreadsheets

Learners are sometimes requested to 'Hide' columns or rows within a spreadsheet. Examiners cannot allocate marks for this unless the column and row headings are displayed on the printout.

Modifying database reports

Having spent considerable effort creating a query and generating a report as part of a Level 3 test, learners often discover that some of the data in their printed report is either cropped or hidden beneath other columns of data. In order to achieve full marks, all the required data must be fully displayed.

Learners should be encouraged to spend time using the database software available to them to practise generating and modifying reports in order to ensure that all the required data is fully displayed when printed.

Printing footers in database reports

When producing database reports, learners are usually required to place additional information (their name, page number, date, etc) in the footer. Awarding bodies have reported on numerous occasions that many learners find this difficult, particularly as some database software generates default information in report footers. Encourage your learners to practise amending any default information and adding new information of their own (such as their own name).

Health, safety and legal issues

All learners involved in the use of ICT need to be aware of the issues involved in health and safety, data protection, copyright, and personal and system security.

Health and safety

While employers have a duty to set up and implement policies for safe and healthy use of ICT in their organisation, learners and employees have a responsibility to ensure that they work safely and minimise health risks when using computers.

There can be many existing and potential hazards for learners in working environments. Hazards can be caused by the bad positioning of hardware or the poor condition of equipment. These types of risks include:

- tripping over badly placed cables and/or equipment
- electric shocks from damaged or poorly maintained equipment
- eye strain, fatigue, stress and discomfort
- problems arising from poor posture.

It is important that learners take responsibility for their own working environment, identify hazards and deal with them effectively. They should follow safe practices which can prevent accidents and reduce health risks. They should also be aware of the long-term effects of poor posture when using computers.

Legislation

Learners involved in key skills are not expected to know every aspect of the various regulations applying to the use of ICT. However, they should at least be aware of the existence of the **Health and Safety at Work Act 1974**, and know that this applies to all work premises and sets out the responsibilities of employers and employees. They should understand that this is an 'umbrella act' as it covers all health and safety legislation, including ICT.

Key points covered by legislation

Employers must assess and, if necessary, rectify the following.

- **Reflection and glare** – the display screen may need to be lowered or raised in order to reduce glare.
- **Lighting** (including natural light, room lights and spotlights) – make sure that lights do not flicker and sunlight is not shining directly on the display screen.
- **Heat and humidity** – temperatures should be between 16°C and 23°C and ideally be kept at 19°C.
- **Radiation levels** – these must be reduced to negligible levels from computers. Most computers have power management systems that block unnecessary emissions by automatically powering down the monitor when not in use.

- **Noise** – the noise level from hardware, printers and other equipment in the working environment should be monitored.
- **Space and ergonomics** – there should always be enough space for each user to work comfortably. Desks and/or work surfaces should allow for flexible arrangements of the screen, keyboard, documents and related equipment.

Hazards

Learners should look out for, and address or report, the following hazards:

- trailing electric wires and cables
- worn, frayed or poorly positioned computer cables
- hardware faults, such as faulty switches, broken or ‘sticky’ keyboard keys, damaged USB sockets
- obstacles in gangways
- poorly positioned equipment such as printers, screens and keyboards.

Remember, there is absolutely no point in encouraging learners to be aware of safety regulations if nothing is done about any issues that they report to you or your colleagues. One good way of showing learners that your organisation takes proper account of health and safety issues is to display simple safety logs (such as the one illustrated below) in appropriate locations.

Network Room 3 – Safety Log				
Problem	Date reported	Reported by	Action taken	When
Damaged USB socket on WS23	02/12/2007	Yr 10 student	socket replaced	14/12/2007
sparkling mains switch on power supply to WS8	12/12/2007	staff	switch repaired	12/12/2007
Trailing wires between WS14 & WS15	12/12/2007	Yr 12 student	Wires looped and attached to desk	17/12/2007

Not only does this encourage learners to report safety issues, but it can be used to make them aware of the need to prioritise maintenance and repair issues. For example, the damaged USB socket was a low priority repair because it posed no physical threat to users, so it could be repaired during a scheduled routine maintenance session a couple of weeks after it was reported. However, the faulty mains switch was extremely high priority because it was a life-threatening hazard, so it was repaired immediately.

Data protection

Learners should know that the law protects people against unauthorised access to personal information on databases. Organisations using databases that contain personal information must comply with the **Data Protection Act 1998** and must register with the Information Commissioner. When registering, all organisations must state the purposes for which the data they are storing is to be used. Any use of personal data outside these areas is illegal. Confidential data of this kind should be contained in a single building, so that computers are not linked to others through telephone lines allowing others to gain access.

Principles of data protection

Anyone processing personal data must comply with the eight enforceable principles of good practice. These state that the data must be:

- fairly and lawfully processed
- processed for limited purposes
- adequate, relevant and not excessive
- accurate
- not kept longer than necessary
- processed in accordance with the data subject's rights
- secure
- not transferred to countries without adequate protection.

Computer misuse

The **Computer Misuse Act 1990** created three new offences:

- unauthorised access to computer material – to prevent hacking
- unauthorised access with intent to commit and then facilitate the commission of a further offence – to prevent manipulation of confidential data
- unauthorised modification of the contents of any computer with the intention of interfering with the operation of the computer – to stop the illegal introduction of computer viruses that corrupt or destroy data.

This is why it is so important for organisations to address the problem of security risks. The best way to do this is to set up effective passwords and limit access to systems that contain sensitive data.

Software copyright

Learners should understand that, when someone purchases software, they are purchasing only a licence to use the software and should be aware of the conditions of its use. A software licence usually states that you may not copy, rent or lease the software, and that it may be used on only one machine.

This means that an organisation that wants to run the software on 20 workstations would need either to buy 20 copies of the software (which would be extremely expensive) or to purchase a single copy of the software plus a site licence for 20 workstations (which works out much cheaper).

Make sure that your learners are aware that loading and/or using unauthorised or 'bootleg' copies of software is against the law, and it is an offence that carries severe penalties.

Virus protection

Most learners will be familiar with the concept of a virus. They may not realise that some viruses will destroy data on workstations and servers; this will include all their own work. Other viruses can generate such a volume of network traffic that they can bring networks to a standstill, making it impossible for learners to do any work.

Learners should be aware there are two main ways that users can infect computers with viruses: by downloading the virus from a local network or from the internet, or by introducing the virus from a data storage source (DVD, CD-ROM, USB data stick, etc) that has been infected while being used on another machine (eg at home). Currently, the most common cause of infection by viruses is opening infected email attachments.

Make sure that your learners understand that, in order to limit the chance of a virus infecting a system (be it a single PC or an entire network), it is essential that effective virus protection software is installed. They should know that, because new viruses are constantly being developed, it is important to keep virus protection software up to date by regularly downloading updated virus definition lists. Most reputable virus protection software suppliers provide subscribers with the opportunity to update their system on at least a weekly basis.

Learners need to be encouraged to minimise the risk of spreading viruses by ensuring that all portable data media (eg DVDs, CD-ROMs, USB data sticks) and all files downloaded from the internet are checked for viruses before use. The more that they see that this is in their own interests, the more careful they are likely to be.

Assessing Information and Communication Technology

While this guide can give general advice about assessing Information and Communication Technology, it is essential that you consult your awarding body for details of their particular procedures and requirements.

As with all the key skills qualifications, to gain an Information and Communication Technology key skill qualification candidates must provide evidence that they have met all the assessment criteria in Part B of the standards and that they have the knowledge specified in Part A.

For Information and Communication Technology, this is assessed in two ways, through:

- **a portfolio of evidence** – which shows that candidates have met all the assessment criteria in Part B of the QCA standards
- **a test** – to confirm candidates' knowledge of Part A of the standards and to corroborate the evidence in the portfolio.

This section looks at both aspects of assessment. However, it is essential to check your awarding body requirements and to talk to your key skills coordinator or manager and internal verifier to clarify your own organisation's systems. You should also look at your awarding body's documentation and the QCA guidance.

The portfolio

All six key skills require learners to complete a portfolio as part of their assessment.

A portfolio is usually a folder of evidence which shows that the learner has met all the assessment criteria in Part B of the standards. The essential points are that portfolio evidence must be:

- **purposeful** – the evidence should be generated in the context of a task or activity that satisfies some purpose in the learner's work, study or leisure; the activity must have a purpose and relevance of its own; evidence that has been generated simply to satisfy the requirements of the portfolio is not purposeful
- **authentic** – evidence must have been produced by the learner, with no more help than the standards allow
- **valid** – evidence must show what it claims to show
- **sufficient** – evidence must include all that is required by Part B of the standards.

Whatever approach you choose, portfolio building should start as soon as possible as it is very difficult for a learner to catch up later.

It can be helpful for learners to keep two separate folders. The first one is for 'work in progress', which could include all drafts and learning activities. The other one forms the basis for the final portfolio and includes evidence that has been selected from the work in progress file and assessed as meeting the standard. The value of this approach is that it avoids the production of portfolios that are too bulky and contain evidence that is irrelevant or duplicated.

The QCA guidance (p18) states: 'Volume is not a measure of quality. Evidence should be carefully selected to show that the criteria have been met for each component of a key skill' and 'Set exercises can help learners learn the skills involved in presenting evidence, but including a large amount of work of this type in a portfolio is unacceptable.'

Forms of evidence

There are several types of evidence that are particularly relevant to Information and Communication Technology:

- **written material**, such as action plans, notes, annotation, reports
- **visual products**, such as screen displays, web pages, PowerPoint presentations, screen savers, on-screen artwork
- **physical products**, such as reports, printouts, menus, posters, brochures, timetables, handouts from PowerPoint presentations, screen shots
- **observation records**, produced by an assessor who has observed the learner's performance and made judgements against the assessment criteria (eg notes to confirm that the learner carried out particular tasks on-screen, even though no hard copy was produced) and witness statements.*

It is a common misconception among learners that, with ICT, it is sufficient to focus on the end product, because this implies that the process skills required to achieve the end product have been covered. However, this is not the case, and it is essential to recognise that evidence of outcomes alone is not enough. Learners' portfolios must contain clear and explicit evidence of the processes they have used in order to achieve the desired outcomes (ie the end product), as this is central to the key skill.

At Levels 1 and 2 there is no requirement for the evidence to be holistic (ie follow through all three components of the unit to show the entire process involved in achieving the outcomes for a single task), although learners may well find it more straightforward to generate evidence in this way. At Level 3 the portfolio **must** include at least one example of all assessment criteria for components ICT3.1, ICT3.2 and ICT3.3 being met within the context of one single task.

It is worth noting that, while collaborative work is acceptable, a learner's portfolio needs to show clearly what they (as an individual) have contributed to the group effort. Designing activities that allow individuals the opportunity to meet all assessment criteria within the context of a group task is not easy, and learners often get confused between individual and group achievements. Consequently, most practitioners tend to encourage learners to undertake individual tasks, thus allowing learners to remain focused on their own personal goals.

*A **witness statement** is a statement, signed by a competent person, which confirms that the learner completed the activity in question. This might be from an employer confirming that a learner used advanced search criteria when searching for information on a database, or from a technician confirming that a learner had sought appropriate assistance in order to solve a software problem. A witness statement should not be the sole form of evidence. Assessors are responsible for judging the validity of witness statements.

The standards do not stipulate the use of any particular hardware or software packages, but learners obviously need to have access to the equipment and software that are appropriate to the type of work, study or leisure activities with which they are involved.

In compiling their evidence, learners will develop the 'specific skills' required to use particular software applications effectively, but it is also important for them to be able to apply 'generic' skills such as decision-making (eg in choosing particular software for a task), judgement (eg in identifying the relevance of particular types of information) and awareness of audience (eg in choosing how best to meet the needs of a particular group).

Presenting the portfolio

Portfolio presentation varies according to organisation and awarding body requirements, but usually includes:

- an index of evidence, showing where the evidence can be found in the portfolio or another location. ICT evidence can be contained in a portfolio for another qualification – for example, an A level or NVQ – but it must be clear that the work submitted has been separately assessed against the key skills criteria
- descriptions of the learning activities the candidate undertook, or an explanation of the context in which the evidence was produced, together with its purpose and expected outcome
- sufficient evidence that the candidate has met in full the criteria for each component in Part B
- assessment sheets and records – assessors should annotate evidence and complete awarding body documentation to show that it has been assessed
- records of internal verification/moderation.

You should check portfolio requirements with your awarding body. They may also provide suitable pro formas.

The test

At Levels 1 and 2 the ICT tests last 1 hour and consist of 40 multiple-choice questions.

The tests can be taken in three different ways, although not all awarding bodies offer all three options.

- **Paper-based tests** come as a booklet containing instructions plus questions. There is a separate OCR answer sheet. Candidates mark their answers on these sheets, not on the question papers. At Levels 1 and 2 candidates put a mark beside one response for each question.
- **On-screen tests** are available on CD or for download so that learners can do them on a computer. You can send them to the awarding body on a disc or by email.
- **Online tests** – learners can do online tests via the internet.

Traditionally, Level 1 and Level 2 tests were available on set dates. However, awarding bodies are increasingly moving to on-demand testing, where tests are available flexibly and as required. Indeed, some awarding bodies allow centres to book online tests on the day. It is essential that you check details with your awarding body.

At Level 3 the ICT test lasts 1 hour 30 minutes and consists of two practical tasks, each worth approximately half the available 50 marks.

- The tasks included in the tests are predominantly based on the use of standard office software (eg database, spreadsheet and word-processing).
- Each test is based on one or more data files, which are made available on the QCA website well in advance of the test. In September 2007 there were 47 folders of data files at Level 3, covering a very wide range of contexts and scenarios.
- The data files are downloaded by centres and made available to candidates for use in the test. However, there is no restriction on candidates having access to the data files for practice purposes prior to the test, and centres are actively advised to encourage learners to make use of the data files when preparing for the tests.
- Each test specifies the files to be used and candidates are required to import the relevant files into appropriate application software (eg word-processing, database, spreadsheet) during the test.

Each year there are six scheduled test series for the Level 3 tests, but not all awarding bodies offer all six series. Contact your awarding body to check which series are available to you.

The key skills assessment system

The key skills assessment system is designed to ensure that assessment of key skills qualifications across all centres is valid, reliable and consistent with national standards.

There are three roles that contribute to achieving this: the assessor, the internal moderator/verifier and the external moderator/verifier.

- **The assessor** is responsible for helping learners to compile their portfolio, and for the initial judgement of a candidate's performance.
- **The internal moderator/verifier** is responsible for ensuring that the standards of assessment in a centre are consistent both across the centre and with national standards.
- **The external moderator/verifier** is appointed by the awarding body and is responsible for ensuring that internal assessment is valid, reliable, fair and consistent with national standards.

Assessor and moderator competence

Awarding bodies offer training and support for assessors and internal moderators/verifiers. There are 16 awarding bodies that offer key skills. They are listed on the QCA website www.qca.org.uk/qca_6564.aspx

Key skills assessors and internal moderators/verifiers are not currently required to have specific qualifications.

However, the QCA guidance (p18) states: 'Assessment of work against the key skills criteria should be carried out by someone with appropriate specialist expertise to understand the full implication of the standards.'

Assessors and moderators/verifiers should schedule regular standardisation meetings to review the quality of their learners' work and to share ideas and experience about best practice and evidence and assessment opportunities.

Appendix 1

Developing your practice

Your work on this guide is likely to have suggested changes you might make to both your own and your organisation's practice. To be able to support your learners as they develop and apply ICT skills, you need:

- awareness of what is involved in the ICT skills – ie you need to be 'consciously competent'
- a range of teaching and learning strategies – different learners will see the ICT skills in different ways and so use different strategies; you will need to support all these strategies
- good communication skills – you should be able to listen to and respond to a range of questions from your learners, as well as explaining strategies in ways that are meaningful.

Spend some time reflecting on your own ICT skills.

- What are your strengths in finding and selecting information, entering and developing information and presenting information?
- How do you currently teach these skills to your learners? How could you make use of the ideas from this guide in your teaching?
- How do you ensure that you keep up to date with changes in technology and software updates?
- Which aspects of teaching ICT would you like to develop further?
- How might you do this?

Then think about your organisation's current provision.

- Where is your current provision already strong? How can you build on this? Does your organisation have any subject learning coaches who can support you?
- Where do you wish to make improvements to your practice? You may wish to set SMART targets for these.
- What specific ideas would you like to try out in your teaching?

Your work with learners in developing their ICT skills is an important part of your own continuing professional development (CPD). As you develop your skills in supporting learners, you may wish to seek recognition of your expertise. Visit the websites for the Institute for Learning (IfL) and Lifelong Learning UK (LLUK) as well as the National Teaching and Learning Change Programme (NTLCP), KSSP and the Skills for Life Improvement Programme (SfLIP) (see Appendix 2, p39).

Appendix 2

Resources and support

The Key Skills Support Programme provides a range of other resources. These are available from www.keyskillsupport.net or the QIA Excellence Gateway <http://excellence.qia.org.uk>. In particular, you may find the following useful.

- Key Skills Trainer. This interactive resource can be found at www.keyskills4u.com. It provides learners with an opportunity to check what they know about ICT at Levels 1 and 2 and brush up on those areas they are less familiar with. The resource also includes an interactive game that encourages learners to apply their ICT skills.
- Key Skills Practice tests. This interactive resource can also be found at www.keyskills4u.com and provides learners with four on-screen practice tests (two at Level 1 and two at Level 2). The practice tests (each of which contains 40 questions) aim to help learners get ready for the tests in Communication, Application of Number and ICT at Levels 1 and 2.
- *Level crossing: progression from Skills for Life to key skills* (KSSP, 2006) provides advice and guidance to teachers supporting key skills learners through the transition from Entry levels 2 and 3 (Skills for Life) to Level 1 key skills. It consists of a number of active learning strategies to use with learners.
- 'How to' worksheets for learners cover 10 specific aspects of ICT such as finding information, using styles and templates, and managing files.
- The *Initial assessment toolkit for key skills and Skills for Life* (KSSP, 2006) explains a range of techniques and includes tools and resources you can use for initial assessment of all the key skills.
- Good practice guides. These publications are designed to provide practical advice and guidance to teachers delivering and assessing key skills. They are based on the experience of centres that have been delivering key skills. Of particular interest to ICT practitioners will be:
 - *Teaching and learning: Information and Communication Technology* (KSSP, 2004), written specifically for schools and colleges
 - *Supporting ICT* (KSSP, 2006), written specifically for work-based learning
 - *Using ICT in delivering key skills* (KSSP, 2006)
 - *Key skills portfolio assessment* (KSSP, 2007)
 - *Preparing for the level 1 and 2 tests* (KSSP, 2005)
 - *Preparing learners for the Level 3 tests: Information and Communication Technology* (KSSP, 2007)
 - *Effective practice in teaching and learning: Working with Others* (KSSP, 2008)
 - *Effective practice in teaching and learning: Communication* (KSSP, 2008)
 - *Effective practice in teaching and learning: Improving Own Learning and Performance* (KSSP, 2008)
 - *Effective practice in teaching and learning: Problem Solving* (KSSP, 2008).

Other resources

- For more about the key skills standards, visit the Qualifications and Curriculum Authority (QCA) website at www.qca.org.uk
- For more about CPD, visit the Institute for Learning website at www.ifl.ac.uk, Lifelong Learning UK at www.lluk.org or the Institute of Educational Assessors (IEA) at www.ioea.org.uk. For the National Teaching and Learning Change Programme, visit www.qia.org.uk and for the Skills for Life Improvement Programme, visit www.sflip.org.uk

References

Swain, J and Swan, M (2007) Maths4Life *Thinking Through Mathematics Research Report*. London: NRDC.

Appendix 3

Understanding the Information and Communication Technology standards

This section explains the overall structure of the standards and what learners have to do at each level. As a teacher or assessor, however, you must become familiar with all the detail of the standards. You can download these from the QCA website (see Appendix 2, p39).

If anything is unclear, you should refer to the QCA document *The key skills qualifications standards and guidance – communication, application of number and information and communication technology – levels 1–4* (QCA, 2004; ref QCA/04/1272). This provides amplification of the standards together with guidance on assessment.

Structure of the standards

The ICT standards are available at Levels 1–4. At each level there are three components, broadly covering:

- searching for and selecting information
- entering and developing information
- presenting information.

QCA presents the standards at each level in a four-page leaflet.

- The front cover introduces the key skill.
- Part A sets out what learners need to know – often referred to as ‘underpinning knowledge’.
- Part B sets out, in three parts that are referred to as ‘components’, what learners must show that they can do. This is the evidence they must include in their portfolios. Part B also states how many examples they must provide.
- Each component in Part B also has a series of sub-components that provide the criteria for judging the learner’s performance. These appear under the heading ‘Evidence must show you can’.
- The back cover gives examples and guidance.



The levels

At each increase in level learners are expected to:

- draw on more complex and a wider range of techniques
- take a more active role in the planning process
- take more decisions and, at Level 3, justify their methods.

Part A: What learners need to know

Part A of the standards sets out what learners need to know in order to meet these requirements. The following table highlights some of the key points. We have presented these in a way that relates to the content of this guide. When assessing learners' work, you should always refer to the exact wording in the standards.

	Level 1	Level 2	Level 3
Finding information	Find different types of information from ICT sources and non ICT sources	Identify suitable sources of information Search for information using multiple search criteria	Plan and organise your work Choose appropriate search techniques for finding information efficiently
Selecting information	Select information relevant to your purpose	Interpret information and select what you need for different purposes	Select sources of information which are suitable for your purpose
Entering information	Enter information using formats that help development	Enter and combine information, using formats that help development	Enter information in consistent formats Use software features to improve the efficiency of your work

	Level 1	Level 2	Level 3
Developing information	Develop information in the form of text, image and numbers	Develop information in the form of text, images and numbers Derive new information	Create and use structures and procedures for developing and combining text, images and numbers Derive new information
Using layouts and techniques	Use layouts and techniques to suit different purposes	Select and use layouts and techniques to suit different tasks Develop the presentation to suit your purpose and audience and the types of information used ie text, images and numbers	Develop the structure of your presentation Develop and refine your presentation by combining text, images and numbers
Presenting information	Present information in a consistent way making sure it is accurate and clear	Present information in a consistent way Ensure your work is accurate and clear	Present information so that it meets your purpose and the needs of the audience
Sending email	Send and receive email	Send and receive email	Send and receive email with attachments
Solving problems	Know how to get help when dealing with errors	Identify errors and their causes	
Health, safety, security and legal issues	Minimise health risks Save information so it can be found easily	Minimise health risks Minimise risks from viruses Observe copyright and/or confidentiality when it is necessary	Minimise health risks Minimise risks from viruses Save your work for easy retrieval and to avoid loss, using version management

Part B: What learners must do

The table below presents the Part B components – what learners must do at each level.

Level 1	Level 2	Level 3
<p>Overall, through two or more activities you must:</p> <p>At all levels:</p> <ul style="list-style-type: none"> include at least one ICT based information source include at least one non ICT based information source use at least one example of text, one example of image and one example of number present evidence of purposeful use of email. <p>Level 3 learners must also:</p> <ul style="list-style-type: none"> show that you can plan and carry through a number of different tasks, one of which must be a major task covering ICT3.1, ICT3.2 and ICT3.3 cover each component at least twice, and cover ICT3.3 for at least two different audiences – smaller tasks may be used to ensure each component is covered use one example of combined information such as text and number, or image and number or text and image include an attachment related to the task on one of the emails. 		
<p>ICT1.1 Find and select relevant information</p>	<p>ICT2.1 Search for and select information to meet your needs Use different information sources for each task and multiple search criteria in at least one case</p>	<p>ICT3.1 Search for information, using different sources, and multiple search criteria in at least one case</p>
<p>ICT1.2 Enter and develop information to suit the task</p>	<p>ICT2.2 Enter and develop the information to suit the task and derive new information</p>	<p>ICT3.2 Enter and develop the information and derive new information</p>
<p>ICT1.3 Develop the presentation so that the final output is accurate and fit for purpose</p>	<p>ICT2.3 Present combined information such as text with image, text with number, image with number</p>	<p>ICT3.3 Present combined information such as text with image, text with number, image with number</p>

Useful addresses

AQA (Assessment and Qualifications Alliance)
Devas Street
Manchester M15 6EX
Tel 0161 953 1180
Publications 0870 410 1036
www.aqa.org.uk

BSA at NIACE
(Basic Skills Agency)
Commonwealth House
1–19 New Oxford Street
London WC1A 1NU
Tel 020 7405 4017
Publications 0870 600 2400
www.basic-skills.co.uk

CfBT (Centre for British Teachers)
60 Queens Road
Reading
Berkshire RG1 4BS
Tel 0118 902 1000
www.cfbt.com

City & Guilds
1 Giltspur Street
London EC1A 9DD
Tel 0207 294 2468
www.city-and-guilds.co.uk
www.key-skills.org

DCSF (Department for Children, Schools and Families)
Functional Skills Policy Team
Room E3c
Moorfoot
Sheffield S1 4PQ
Tel 0114 259 3781
Publications 0845 602 2260
www.dcsf.gov.uk

DIUS (Department for Innovation, Universities and Skills)
Key Skills Policy Team
Room W3d
Moorfoot
Sheffield S1 4PQ
Tel 0114 259 4731
Publications 0845 602 2260
www.dfes.gov.uk/keyskills/what.shtml

Edexcel
One90 High Holborn
London WC1V 7BH
Tel 0870 240 9800
Publications 01623 467467
www.edexcel.org.uk

Functional Skills Support Programme
5th Floor
120 Holborn
London EC1N 2AD
Helpline 0870 872 8081
www.LSNeducation.org.uk/functionalskills

Key Skills Support Programme
5th Floor
120 Holborn
London EC1N 2AD
Helpline 0870 872 8081
www.keyskillssupport.net

LSC (Learning and Skills Council)
Cheylesmore House
Quinton Road
Coventry CV1 2WT
Tel 0845 019 4170
www.lsc.gov.uk

LSN (Learning and Skills Network)
5th Floor
120 Holborn
London EC1N 2AD
Tel 0845 071 0800
www.LSNeducation.org.uk

OCR (Oxford Cambridge and RSA Examinations)
Coventry Office
Progress House
Westwood Way
Coventry CV4 8JQ
Tel 02476 851509
www.ocr.org.uk

Ofsted
Royal Exchange Buildings
St Ann's Square
Manchester M2 7LA
Tel 08456 404045
www.ofsted.gov.uk

QCA (Qualifications and Curriculum Authority)
83 Piccadilly
London W1J 8QA
Tel 020 7509 5555
Publications 01787 884444
www.qca.org.uk/keyskills

QIA (Quality Improvement Agency)
Friars House
Manor House Drive
Coventry CV1 2TE
Tel 0870 1620 632
www.qia.org.uk

SNS (Secondary National Strategies)
1 New Century Place
East Street
Reading
Berkshire RG1 4QH
Tel 0845 850 1444
www.standards.dfes.gov.uk

UCAS (Universities and Colleges Admissions Service)
Rosehill
New Barn Lane
Cheltenham GL52 3LZ
Tel 01242 222 444
Publications 01242 544 610
www.ucas.ac.uk

The Key Skills Support Programme
is delivered on behalf of QIA by the
Learning and Skills Network.

