TEACHER'S NOTES

ICT Levels 1 and 2

Chapter 2
Safety and security

EDEXCEL FUNCTIONAL SKILLS PILOT

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ICT Levels 1 and 2

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Draft for pilot centres

Chapter 1:   Using ICT systems
Chapter 2:   Safety and security
Chapter 3:   Find and select information
Chapter 4:   Using ICT-based information
Chapter 5:   Entering, developing and combining information (part A)
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Chapter 7:   Presenting information
Chapter 8:   Communicating using ICT
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How to use the Functional ICT materials

These materials have been developed to help learners acquire the skills that are outlined in the QCA Functional Standards for ICT under the three skills areas of 'Use ICT systems', 'Find and select information', 'Develop, present and communicate information'.

The structure of the materials

The chapters follow the sequence of the standards, with each chapter divided into sections matching the coverage of the standard or standards indicated. The standards are given at the start of each chapter, using the wording from the official document on the teacher pages and an adapted version, more appropriate to learners' needs, on the learner pages.

This structure should not be taken as a recommended teaching framework but merely as the method deemed most appropriate to demonstrate complete coverage of the standards. It is expected that teachers will organise their teaching sessions according to the needs, level of experience and interest of their learners, and the contexts in which they are working.

It should also not be assumed that material included here will form part of the functional skills assessment: by its very nature, the assessment will cover only part of the standards.

Level differentiation

The learner's materials are for learners working at Levels 1 and 2, and the content and activities designed to be accessible to Level 1 learners. No attempt has been made to differentiate between the two levels in the pages of the learner's materials. The teacher's notes, however, use bold text (presented in a tinted box) to identify those activities and teaching points that are intended for Level 2 learners. The basis of the design of the materials is that, as in the standards, differentiation will be as much by outcome as by activity. The other key level differentiators – complexity, familiarity, technical demand and independence – are reflected in the tasks, which are designed to show the progression that is a feature of the standards:

At Level 1, learners would be expected to:
• identify the ICT requirements needed to solve a straightforward task and apply their knowledge and understanding to produce an appropriate solution (complexity)
• apply their knowledge and skills within a non-routine but familiar context (familiarity)
• apply a range of techniques in a number of applications to produce an appropriate outcome (technical demand)
• solve problems that are essentially instructor/tutor guided, demonstrating the confidence to make informed choices and knowing when to seek guidance (independence)

At Level 2, learners would be expected to:
• analyse multi-step tasks and separate the components, identifying the relevant ICT requirements applying their knowledge and understanding to produce an appropriate solution (complexity)
• apply their knowledge, skills and understanding within non-routine and non-familiar contexts (familiarity)
• demonstrate the application of a wide range of techniques across several applications to produce an appropriate outcome (technical demand)
• solve problems independently, overcoming challenges to produce successful outcomes (independence)

This differentiation between levels requires the teacher to provide more guidance at Level 1 than at Level 2. With Level 1 learners, for example, teachers may choose to use a simplified task to allow a learner to practise the skill within their prior experience, whereas they may choose to enhance the challenge for a Level 2 learner by using a more complex task that matches the learner's experience (more specific suggestions for differentiation are contained in the teacher's notes).

The activities have been developed with this varying guidance in mind, so that later activities in each section are expected to be undertaken with less teacher support. The expectation is, though, that all learners will be engaged in the learning process through discussion and social interaction.

The elements of the chapter

The chapters follow the standards and are divided into sections broadly corresponding to the coverage of those standards. Within each section there are two main sub-sections: 'Learn the skill', which provides information and facts for discussion and exploration; 'Develop the skill', which provides activities to practise the skills, test understanding and extend knowledge. The pages of the learner materials also direct the learner to additional electronic resources in the form of 'skills demonstrations' (captivates) and 'assets'.

Captivates are screen-based skills demonstrations of points made in the text, which the learner can click on for instruction or information.

Assets are files of information provided or stored digitally, which may include photographs, sound clips, databases, spreadsheets, etc. These may also include material learners will need to perform the activities (e.g. tables to complete).

These resources are available on the website, at the same point where these materials were available for downloading.

A note on resources and providing a safe working environment for learners

Any suggestion for software to be used with activities is not meant to be exclusive. It is understood that different centres will have different resources, and that some centres will allow learners only limited access to the internet, will not accept downloading and will allow learners only partial control over their work-station. The resources have been developed on the understanding of variations in resources, access and control, but there are still bound to be activities that present challenges for some centres. Where possible, suggestions for alternatives have been given in the teacher's notes; teachers are expected, in any case, to adapt activities for the use of their own favourite, or personally developed, resources.

These restrictions on internet browsing, downloading, and altering machine configurations may create difficulties on functional skills courses, where the standards require learners to actively engage in such tasks. One possible technical solution to this problem is to employ **virtual machine software**, which allows an instance of an operating system (usually Windows or Linux) to be run in a virtual environment that is isolated from the real machine. Changes made in the virtual machine have no effect on the real machine and can be completely discarded when the virtual machine is closed. Alternatively, a working state can be preserved in the virtual machine by taking a 'snapshot' before closing the virtual machine.

A virtual machine can be used to safely browse the internet, download and install software, and explore machine settings, with no risk to the real machine or associated network.

The best-known virtual machine products are Microsoft Virtual PC (currently free) and VMWare Workstation.

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2 Safety and security

(pages 4–10 in the learner materials)

Skills area: Use ICT systems

Skill	Coverage	Unit
Level 2 content in bold	Level 2 content in bold	
4 follow and understand the need for safety and security practices	**4.1** minimise physical stress	**A** Working comfortably and safely
	4.2 keep information secure	**B** Keeping information secure
	4.3 understand the danger of computer viruses, and how to minimise risk	**C** The danger of computer viruses
	4.4 understand the need to stay safe and to respect others when using ICT-based communication	**D** Staying safe and respecting others
5 troubleshoot	**5.1 identify ICT problems and take appropriate action**	**E** Troubleshooting

A Working comfortably and safely

Ask learners if they suffer from any ill-effects when using the computer for a length of time. Look at the picture and draw out the differences between good and bad practice.

Activities

A1–A7: Use the asset questionnaire and these activities to focus the learners on their own behaviour. Sites for further information are www.rsi.org.uk/text_only/hazard/rsi_in_children_additional.asp
www.leeds.ac.uk/lsmp/healthadvice/computerergonomics/computergonomics.htm
How will learners ensure they keep to the guidance?

B Keeping information secure

Talk about the importance of backing up work in a separate location. Ask learners for anecdotes about losing information. What did they do? Did they have a backup? Do they store their files securely? Discuss what makes a secure and memorable password.

Activities

B1–B3: Learners may need a CD or storage device for backing up their work.

Make a backup of a folder containing files to a floppy disk or memory stick. Change the name of one of the files in the folder and then use the Restore option to restore the original file from the backup.

B3: You may want to use **virtual machine software** for this activity, or to control it from your machine.

Level 2

For B1, learners could use software such as Windows Backup Wizard.

C The danger of computer viruse

Do the learners know the names of any particular viruses? Discuss the different common types.

Viruses were very common in the 1980s. Today 'spyware' poses an additional risk. Spyware is a type of malware (**mal**icious soft**ware**) that uses a user's internet connection to infect the computer. Spyware infections often come from downloading 'free' shareware programs, music or film, from the internet, or using peer-to-peer networks. Once they're in your computer they can be difficult to remove without the use of anti-spyware tools.

Show learners examples of virus-/spyware-checking software. Is any malware detected? How many files are reported as being scanned?

Activities

C1–C5: Help the learners to find the information to answer the questions and extend their knowledge.

Level 2

If possible ask learners to use an anti-virus or anti-spyware program to run a scan on the C: drive of their computer. Discuss their findings. Talk about the dangers of downloading 'exe' file extensions.

D Staying safe and respecting others

Discuss sensible precautions when disclosing email and home addresses, telephone numbers, etc. Talk about how facilities such as *bcc* can help avoid sharing email addresses with others.

There are a number of sites giving guidance on 'netiquette', for example:
www.lancs.ac.uk/iss/email/netiquette.htm

www.ucl.ac.uk/natural-sciences/netiquette

There are also some additional tips worth giving learners about e-safety:

- Never arrange to meet a stranger you chat to online
- Don't believe everything you read and see on the internet
- Just because someone says they're 12, it doesn't mean they are
- Report any instances of cyberbullying to your teacher or your parents
- Respect other people's privacy
- Keep your password safe

Discuss uploading inappropriate images and the effects it could have on others. What is amusing to one person could be embarrassing to another, e.g. photos from a private party.

Activities

D3: Give examples of clues that help learners to spot hoax emails.

D4: Suggest further sites for learners to explore when looking for free images.

Level 2

Extend the discussion on uploading images. What could learners do to photos to make them more appropriate for uploading? For example, they could crop a photo of a group of friends at a party to show themselves only.

E Troubleshooting

Troubleshooting is a Level 2 requirement, but you may decide that all learners can benefit from some of this section's content.

Point out to learners that, with a paper jam, the printer manual is the best source of help. As a safety precaution, they need to turn the printer off and be careful which parts they touch: some can be very hot.

Explain that 'free' music and video downloads, and also attachments on emails learners aren't expecting, can carry a 'payload'. A payload is when a virus becomes active and unleashes what it has been designed and coded for – for example, erasing certain files or documents.

Learners will not necessarily know how to recognise that their computer has been infected by spyware or a virus infection. You could point out these warning signs:

- The homepage of your browser is changed
- New shortcuts appear on your desktop
- New entries appear in your favourites folder
- The computer becomes sluggish and slow
- Popup windows appear that you are unable to stop or close
- A lot of emails, which you did not send, are returned from people you don't know
- The computer stops responding, or it freezes frequently
- You're not able to access a disk drive
- An anti-virus program is disabled for no reason and the anti-virus program cannot be restarted
- An anti-virus program cannot be installed on the computer, or won't run
- A program disappears from the computer
- An 'extra' toolbar appears in the browser
- An unknown program tries to access the internet
- Internet searches always take you to the same web page
- The computer crashes, and then restarts every few minutes
- Applications on the computer do not work correctly
- Applications do not print correctly
- Unusual error messages are shown
- Distorted menus and dialog boxes are shown
- Strange sounds or music plays from the speakers unexpectedly

Activities

E5: As an extension, ask learners to look at the properties of a CD containing data. It will show as full, even if the quantity stored on the disk is less than the capacity of a CD. Ask them to give reasons for this.