AS and Advanced Vocational Certificate of Education

Information and Communication Technology
Advanced Subsidiary and Advanced
2006

This specification should be read in conjunction with:
Specimen Assessment Materials and Mark Schemes
Reports on the Examination
Teachers’ Guide
The specification will be published annually on the AQA Website (www.aqa.org.uk). If there are any changes to the specification centres will be notified in print as well as on the Website. The version on the Website is the definitive version of the specification.

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Advanced Subsidiary and Advanced Vocational Certificate of Education

1.1 Introduction

The Advanced Subsidiary and Advanced Vocational Certificate of Education (VCE) qualifications have been designed to provide a broad education as a foundation both for training leading to employment, and for further and higher education. This is achieved by ensuring that candidates develop the general skills, knowledge and understanding that underpin a range of occupations or professions and by offering the opportunity to study a number of Key Skills including Application of Number, Communication and Information Technology.

As a result of the Government’s review of post-16 qualifications, these new style VCEs started in September 2000. The new model Advanced Subsidiary and Advanced VCE have been designed to further enhance the motivation and achievement of learners, improving the consistency and manageability of the qualification and incorporating an improved quality assurance and assessment process.

The key features of the new model Advanced Subsidiary and Advanced VCE are:

- a revised unit structure, which includes clear details of learning requirements (What you need to learn), clear statements of assessment requirements (Assessment Evidence Grid) and guidance for teachers (Essential Information for Teachers).
- revised grading criteria related to each individual unit
- a new style of external assessment
- simplified recording
- monitoring and moderation exercises by subject specific moderators.

There has, however, been no change to levels as a result of the introduction of the new model Advanced Subsidiary and Advanced VCE qualifications and in the National Qualifications Framework, the 6 unit Advanced VCE continues to be broadly equivalent to one Advanced GCE qualification at grades A-E or to NVQ Level 3. The Advanced VCE (Double Award) consists of 12 units and is broadly equivalent to two Advanced GCE qualifications at grades A-E or NVQ Level 3. The Advanced Subsidiary VCE, where available, consists of 3 units and is broadly equivalent to one Advanced Subsidiary GCE qualification.
### 1.2 Rationale

The qualification has been designed to enable students to gain an understanding of key Information and Communication Technology pathways and the application of Information and Communication Technology principles. The qualification provides students with the essential skills, knowledge and understanding of the sector and develops career opportunities in the information and communication technology industry as well as enabling entry to further or higher education programmes.

### 1.3 Key Skills

The development of Key Skills is integral to all Advanced Subsidiary and Advanced VCE specifications. The opportunities to develop Key Skills are signposted within each unit.

In order to assist teachers these are summarised in the chart in Appendix E.
Specification at a Glance
Information and Communication Technology

2.1 Qualifications Available

Three qualifications are available.

- Advanced Subsidiary VCE 3 Units (formerly Part Award)
- Advanced VCE 6 Units (formerly Single Award)
- Advanced VCE (Double Award) 12 Units (formerly Full Award)

2.2 Award Requirements

The table below lists the units and indicates for which qualification each is available. Units 1 – 6 are compulsory for the Advanced VCE (Double Award). Details of the assessment schemes are given within each unit.

<table>
<thead>
<tr>
<th>Unit</th>
<th>3 unit</th>
<th>6 unit</th>
<th>12 unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1: Presenting Information</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Unit 2: ICT Serving Organisations</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Unit 3: Spreadsheet Design</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Unit 4: System Installation &amp; Configuration</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Unit 5: Systems Analysis</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Unit 6: Database Design</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Unit 7: Communications and Networks</td>
<td>✔</td>
<td>✔</td>
<td></td>
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<tr>
<td>Unit 8: Interactive Multimedia Presentations</td>
<td>✔</td>
<td>✔</td>
<td></td>
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<tr>
<td>Unit 9: Computer Artwork</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Unit 10: Publishing</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Unit 11: Internet Services and Web Page Design</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Unit 12: Supporting ICT Users</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Unit 13: ICT Training</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Unit 14: ICT Solutions for People with Individual Needs</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Unit 15: Impact of ICT on Society</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Unit 16: Programming</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>
2.3 Optional Language Units

In addition, optional language units have been developed for French, German and Spanish (see 6.5). These are available for the Advanced VCE and Advanced VCE (Double Award).

2.4 Requirements for 3 Unit Award

In order to obtain the Advanced Subsidiary VCE (3 units) the following entry code must be used:

8251

and candidates must take the following units:

Unit 1: Presenting Information
Unit 2: ICT Serving Organisations
Unit 3: Spreadsheet Design.

2.5 Requirements for 6 Unit Award

In order to obtain the Advanced VCE the following entry code must be used:

8254

and candidates must take the three compulsory units:

Unit 1: Presenting Information
Unit 2: ICT Serving Organisations
Unit 3: Spreadsheet Design

plus any 3 other units (as indicated in 2.2 Award Requirements).

Each unit for the 6-unit AVCE contributes one sixth to the award. Content is outlined in the *About this Unit* section. Learning outcomes are contained in the *Assessment Evidence Grid*. The mode of assessment is specified in the *About this Unit* section and the *Assessment Evidence Grid* of the specifications.

2.6 Requirements for 12 Unit Award

In order to obtain the Advanced VCE (Double Award) the following entry code must be used:

8257

and candidates must take the six compulsory units:

Unit 1: Presenting Information
Unit 2: ICT Serving Organisations
Unit 3: Spreadsheet Design
Unit 4: System Installation and Configuration
Unit 5: Systems Analysis
Unit 6: Database Design

plus any 6 other units (as indicated in 2.2 Award Requirements).

Each unit for the 12-unit AVCE contributes one twelfth to the award. Content is outlined in the *About this Unit* section. Learning outcomes are contained in the *Assessment Evidence Grid*. The mode of assessment is specified in the *About this Unit* section and the *Assessment Evidence Grid* of the specifications.
3.1 Availability of Units for assessment

Assessments based on this specification are available as follows:

<table>
<thead>
<tr>
<th>Externally Assessed Units</th>
<th>Portfolio Moderation for each Unit</th>
<th>Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3 6 12</td>
</tr>
<tr>
<td>January</td>
<td>✓</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>June</td>
<td>✓</td>
<td>✓ ✓ ✓</td>
</tr>
</tbody>
</table>

3.2 Entry Codes

Entry must be made for the specification. Please refer to sections 2.4, 2.5 and 2.6 for the specification entry code. In addition the following unit entry codes should be used:

<table>
<thead>
<tr>
<th>Unit 1</th>
<th>I01A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 2</td>
<td>I02A</td>
</tr>
<tr>
<td>Unit 3</td>
<td>I03A</td>
</tr>
<tr>
<td>Unit 4</td>
<td>I04A</td>
</tr>
<tr>
<td>Unit 5</td>
<td>I05A</td>
</tr>
<tr>
<td>Unit 6</td>
<td>I06A</td>
</tr>
<tr>
<td>Unit 7</td>
<td>I07A</td>
</tr>
<tr>
<td>Unit 8</td>
<td>I08A</td>
</tr>
<tr>
<td>Unit 9</td>
<td>I09A</td>
</tr>
<tr>
<td>Unit 10</td>
<td>I10A</td>
</tr>
<tr>
<td>Unit 11</td>
<td>I11A</td>
</tr>
<tr>
<td>Unit 12</td>
<td>I12A</td>
</tr>
<tr>
<td>Unit 13</td>
<td>I13A</td>
</tr>
<tr>
<td>Unit 14</td>
<td>I14A</td>
</tr>
<tr>
<td>Unit 15</td>
<td>I15A</td>
</tr>
<tr>
<td>Unit 16</td>
<td>I16A</td>
</tr>
</tbody>
</table>

3.3 Prohibited Combinations

There are no prohibited combinations of qualifications.

3.4 Multiple Entries

Multiple entries using the same piece of work must comply with the specific criteria for each qualification.

3.5 Private Candidates

This specification is not available to private candidates.

3.6 Special Consideration

Special consideration may be requested for candidates whose work has been affected by illness or other exceptional circumstances. The appropriate form and all relevant information should be forwarded to the department which deals with such matters at the AQA office for the centre concerned. Special arrangements may be provided for candidates with special needs.

Details are available from AQA and centres should ask for a copy of “Regulations and Guidance relating to Candidates with Particular Requirements”.
3.7 Language of Examination

All Assessment units are provided in English. Centres wishing to have a Welsh translation must notify AQA at least four months before the date of the examination.
4

Introduction

4.1 Prior Level of Attainment and Recommended Prior Learning

Students must have sufficient skills, understanding, and knowledge in the Key Skills of application of number, communication, and information technology to cope with the demands of an Advanced level course.

Prior learning at Key Skills level 2, GCSE, or equivalent would be appropriate for communication and application of number. Prior experience of ICT, for example at level 2 or GCSE is advantageous, but not essential.

4.2 Progression

This qualification enables students to develop both a broad understanding of information and communication technology principles as well as the possibility to focus on a specific pathway (applications development, networks and communications or design, support and training). In addition, the qualification covers a mixture of units from the theoretical through to those with a clear practical emphasis.

It is important that prior to the start of and throughout the VCE programme, students are given the opportunity to explore and discuss their interests and aspirations and are provided with realistic guidance as to how the qualification, including the selection of optional units, can help to meet their needs.

The qualification allows for a number of progression routes:

- **Higher Education**: the units provide a sound basis for progression to a range of HE courses e.g. Information and Communication Technology, Information Technology, Business Systems, Management Information Systems, Multimedia.

- **Employment**: the units aim to maintain and support the recognised standards demanded for information and communication technology education and training in order to meet the requirements of the information and communication technology sectors in industry.

- **Related qualifications in the National Qualifications Framework**: the units enable students to progress to other related qualifications such as NVQ levels 3 and 4 in a variety of ICT contexts.
Aims and Objectives

5.1 Aims
This specification has been designed to enable students to gain an understanding of key Information and Communication Technology pathways and the application of Information and Communication Technology principles. The qualification provides students with the essential skills, knowledge and understanding of the sector and develops career opportunities in the information and communication technology industry as well as enabling entry to further or higher education programmes. Advanced Subsidiary and Advanced VCE, therefore, make a distinct contribution to the quality and coherence of the qualifications framework.

5.2 Broad Objectives
The AQA Advanced Subsidiary and Advanced VCE in Information and Communication Technology have the following broad objectives. They provide:

- a broad background of understanding and core knowledge whilst allowing some scope for candidates to focus on particular areas of interest
- a student-centred approach to learning, enabling students to apply knowledge of the application of information and communication technology principles in a practical way
- the opportunity for centres to forge links with industries
- cross-sector themes and approaches so that students can gain an insight into related sectors such as business.

5.3 Subject Specific Focus
In particular, the content of the compulsory and optional units provides students with:

- knowledge of the key aspects of Information and Communications Technology
- a broad and balanced view of the range of applications and information systems, an understanding of the capabilities and limitations, and implications for use
- problem-solving skills through the practical application of information and communications technology
- an understanding of the role of people, technology and systems in organisations
- an awareness of the economic, social and ethical implications of the use of information technology systems.
6 Scheme of Assessment

6.1 Introduction

All Advanced Subsidiary and Advanced VCEs are assessed by a combination of external assessment (externally set and marked) and internal assessment (portfolio evidence).

Each unit is assessed by one method only. A list of units is found in Specification at a Glance.

6.2 External Assessment

Details of the assessment methods are found in each unit. The following units have external assessment:

Unit 2: ICT Serving Organisations
Unit 5: Systems Analysis
Unit 6: Database Design

The externally assessed units have been selected to support all pathways through this VCE. In addition, AQA has designed external assessments which allow candidates to apply knowledge and understanding acquired from teacher-designed activities and assignments based on the What You Need to Learn section of each unit.

6.3 Internal Assessment

All the other units are internally assessed.

All other compulsory and optional units are assessed internally through portfolio work, subject to moderation (ref: Moderation – Section 29). Details of the portfolio evidence which students need to produce can be found in the Assessment Evidence Grids within each internally-assessed unit.

6.4 Requirements for the Qualification

Requirements for the three qualifications are given in Section 2.

6.5 Optional Language Units

For the Advanced VCE (Double Award) in addition to the specification-specific optional units, optional language units have been developed for French, German and Spanish. Candidates may substitute up to two of the specification-specific units for up to two language units, provided the required number of externally assessed specification-specific units are taken. For the Advanced VCE one optional language unit can be taken in place of a specification-specific optional unit. The list of optional language units and entry codes follow:

<table>
<thead>
<tr>
<th>Unit Title</th>
<th>Entry Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>French 1: Oral Communication; Speaking and Listening</td>
<td>FO1A</td>
</tr>
<tr>
<td>French 2: Written Communication; Reading and Writing</td>
<td>FO2A</td>
</tr>
<tr>
<td>German 1: Oral Communication; Speaking and Listening</td>
<td>GO1A</td>
</tr>
<tr>
<td>German 2: Written Communication; Reading and Writing</td>
<td>GO2A</td>
</tr>
<tr>
<td>Spanish 1: Oral Communication; Speaking and Listening</td>
<td>SP1A</td>
</tr>
<tr>
<td>Spanish 2: Written Communication; Reading and Writing</td>
<td>SP2A</td>
</tr>
</tbody>
</table>
AS and Advanced VCE Unit 1

Presenting Information

7.1 About this Unit

This unit helps you to:

• create original documents in styles that suit the users
• improve the accuracy, readability and presentational quality of documents you create
• understand some of the ways organisations present and gather information
• understand why organisations use standard layouts for documents
• choose and apply standard layouts
• understand the need for standard ways of working
• develop good practice in your use of ICT.

You will use your presentation knowledge and skills to create a portfolio of different documents and an extended report on an investigation you have carried out. You will also evaluate a collection of standard documents used by organisations.

This unit provides the basis for all the other units. It is assessed through your portfolio work. The grade on that assessment will be your grade for the unit.

7.2 What You Need to Learn

The topics are:

• styles of writing and use of language
• accuracy and readability
• styles of presentation
• how organisations gather and present information
• standard ways of working.

Styles of writing and use of language

You know what you want to communicate. How will you express it?

There are two important things to remember when preparing information:

• your reader
• the purpose of your document.
You will need to be aware of your reader by using the right kind of language. Unusual words might impress the reader of a job application, but they might annoy someone reading directions to your house. You must also consider the purpose of your document by thinking about the style of language to use. Formal purposes demand a formal style.

Sometimes a communication is designed to collect information from people. Examples are invoices, time sheets, questionnaires and forms such as those used to apply for a driving licence or passport. Forms of this kind need to use simple but clear language. You must learn to use appropriate language and presentation layout to create forms that are easy to understand and easy to complete correctly.

You will use different writing styles to meet different needs. You must learn how the following needs and document structures affect writing style:

- attracting attention
- setting out facts clearly
- writing to impress
- creating a questionnaire
- ordering or invoicing goods
- summarising information
- preparing a draft
- collecting information from individuals
- explaining technical details
- writing a reminder
- preparing a report.

There are tools to help with style. Some assess the reading age that a passage requires. If the reading level seems too high, you can try shorter sentences and simpler words. With some tools you can choose a writing style such as business letter, memo, advertising or report. The advice you get matches the style you chose. Other tools, such as a thesaurus, help you to replace particular words with more appropriate ones.

You must learn to judge the strengths and weaknesses of these tools. This will help you to improve the readability of your presentations. Thinking about the writing style of some of the following examples may help:

- a form for an opinion poll
- a league table of results for a sporting activity
- a draft outline of the results of a survey
- a report to colleagues of a meeting that you attended on their behalf
- a questionnaire
- a curriculum vitae (CV)
- a formal letter responding to a job advertisement
- an agenda for a meeting in a sports and social club
• minutes of a meeting for a sports and social club
• a newspaper advertisement to sell something second-hand
• a formal invitation to a party or other special event
• a glossy single-page advertisement for some new cosmetics
• an e-mail to a company asking for information on a product.

**Accuracy and readability**

It is important that information is accurate. Inaccuracy of information can mislead or annoy readers. Common mistakes are incorrect spelling and missing or incorrect punctuation.

Spell-checkers help you to correct spelling and punctuation. You must learn to use spell checkers to detect words spelt incorrectly and repeated words (for example ‘and and’).

Sometimes a spell-checker will suggest that a word is incorrect when you know it is correct. This often happens with proper names, for example ‘VCE’ or ‘Peter’. You will need to learn that it is possible to create a special personal dictionary, additional to the main dictionary, which contains any unusual words you may wish to use.

Spell-checkers do not tell you when you use a word wrongly or when you have omitted a capital letter at the start of a sentence. It will not correct ‘capitol’ for ‘capital’ or ‘there’ for ‘their’ or ‘to’ for ‘too’. To correct this type of error you must learn to use software that can check grammar. This type of software can help you to make sure:

• sentences end with only one full stop
• there is a capital letter at the beginning of sentences
• your sentences have a subject and a verb that agree
• you avoid common errors like writing ‘you and I’ when it should be ‘you and me’
• for direct effect you write in the active voice rather than the passive
• the readability statistics meet the needs of your readers.

ICT facilities for checking the accuracy of your documents do not guarantee that there are no errors. To check that your document makes sense, is correctly laid out and meets your purpose it must also be proof-read.

When a document is proof-read, it is marked by hand to indicate the changes that are needed. Standard marks, which are published in a British Standard, are used for this type of correction. The marks are used to indicate corrections such as:

• deletion
• start new paragraph
• insertion
• transpose
• change case
• indent.
Styles of presentation

It is important to present information clearly – it may annoy or confuse readers if you present information poorly. Common mistakes are using inconsistent headings or layout and using widely different fonts and point sizes. You must think about what you want to achieve with your document and what will appeal to your readers.

There are several essential features that affect the presentation style of documents. You will need to learn how to use or modify these to attain a presentation style to suit your purpose, including:

- page layout
- graphic images
- textual styles
- special features
- paragraph formats
- position of common items.

You can create an effective page layout by using suitable:

- margins
- headers and footers
- page orientation
- paper size
- pagination
- gutters.

You can create suitable textual styles by careful selection and use of:

- fonts
- heading and title styles
- bold italic and underline
- superscript and subscript
- text orientation
- text animation (on screen).

You can create a variety of presentation styles by using different paragraph formats including:

- tabs and indents
- paragraph numbering
- widow justification
- spacing before/after
- use of tables
- bullet points
- line spacing
- hyphenation.
You can make use of special features to develop special presentation styles, including:

- use of borders
- use of sounds
- a contents page
- use of shading
- background/text colour
- an index
- a bibliography
- text/picture boxes
- an appendix.

You can use a variety of different types of graphics to improve presentation style, including:

- graphs or charts
- lines or borders
- pictures or drawings
- clip art or scanned images.

You will need to understand how to position important items on a document, including:

- references
- signatures
- dates
- logos
- addressee names
- headings.

You will need to know how and when to use any of these techniques in a document. You may need to create many documents before you are able to judge when to use particular techniques.

You will also need to learn:

- how to create templates to standardise styles of presentation
- when to use existing information
- when to create original information
- when to blend existing and original information
- how to maintain a consistent style throughout a document
- how to combine text, sound, graphics and number information harmoniously.

A slide presentation is a good way of experimenting with these techniques. For a slide presentation you put together a sequence of screens of information that follow each other automatically. In a slide presentation there needs to be a pleasing mix of page layout, graphics and text. You also need to judge the time each page (screen) remains in view and plan your pages to suit your viewers.
Organisations range from multinationals to sole traders. In all organisations people work to make something or provide a service. They all need to manage information. You must learn about:

- the types of information that organisations need to use
- how organisations collect their information
- the need to acknowledge sources of information
- the flow of information to and from outsiders, such as suppliers and clients
- why organisations need to present information both within and outside the organisation
- how organisations present information both within and outside the organisation
- typical uses of illustrations, technical drawings, pictures and art work
- commonly accepted standards for the layout of formal documents
- essential information that appears on formal documents
- methods of presenting a corporate image
- how templates might be used to enforce corporate standards.

Organisations use many different types of document. You must show your understanding of writing style, presentation style and common standards for layout in documents such as:

- memos
- agendas
- minutes
- publicity flyers
- invoices
- questionnaires
- business letters
- newsletters
- itineraries
- draft documents
- forms to collect information from people
- fax cover sheets
- e-mail
- reports and technical specifications
- purchase orders
- web pages.

Many organisations have rules and guidelines to help people work effectively and avoid problems. These are known as 'standard ways of working'. They are very important for people working with information technology.

Note: The ‘standard ways of working’ you need to know and use are described below. You must apply these techniques to all of your VCE ICT work. In the other units, the requirements are stated more briefly to avoid repetition of detail.
There are many reasons for having ‘standard ways of working’ in ICT. The most important is that information in ICT systems can be easily lost or misused. For example:

- unauthorised persons may gain access to confidential information
- people may copy original work and present it as their own
- data files may be lost, corrupted by a virus or damaged in other ways
- computers may be damaged so that data stored in them cannot be recovered
- information presented professionally may be believed, even though it may be inaccurate.

‘Standard ways of working’ help you to overcome these problems. In your work with ICT you must ensure that you:

- manage your work effectively
- keep information secure
- work safely.

Managing your work

The way you manage your ICT work is important. You need to learn to:

- plan your work to produce what is required to given deadlines
- use spaces, tabs and indents correctly to ensure consistent layout and easy editing
- use file names that are sensible and remind you of the contents
- store files where you can easily find them in the directory/folder structure
- keep a log of any ICT problems you meet and how you solve them.

Keeping information secure

Protecting information from loss or misuse is essential in ICT. You must learn the particular importance of:

- keeping information secure, e.g. protection from theft, loss, viruses, fire
- protecting confidentiality, e.g. preventing illegal access to medical or criminal records. People or companies may wish to keep information confidential so that others do not know about it. You must learn to keep this type of information secure and not pass it on to others.
• respecting copyright. A computer program, words, pictures and graphic images may belong to other people. The people who created or own this material have copyright and you must not use their work without their permission. If you do you are breaking the law. You must understand and respect copyright law. Where you do use information created by others it is important that you acknowledge the source, by using an appropriate reference or listing it in a bibliography.

If work stored on an ICT system is lost it is important that there is another file that can be used in its place. There are two ways to make this possible:

• by keeping dated backup copies of files on another disk and in another location
• by saving work regularly, and using different filenames.

Working safely

The ICT working environment is relatively safe. However you must avoid:

• bad posture and physical stress
• eye strain
• hazards resulting from equipment or workplace layout.

You should be aware that a comfortable working position is important to avoid physical stress, eye strain or safety hazards. This may include:

• comfortable seating
• suitable desk and VDU position
• suitable keyboard position
• brief rest periods
• avoiding long periods of continuous VDU work
• a surrounding area that includes near and distant objects the eyes may focus on
• careful layout of cables and equipment (to avoid tripping)
• suitable and complete insulation of cables (from electrical supplies).
### 7.3 Assessment Evidence for Unit 1: Presenting Information

**You must produce:**

- six original documents you have created for different purposes to show a range of writing and presentational styles. They must include one designed to gather information from individuals and one major document of at least three A4 pages
- a report describing and comparing two different standard documents used by each of three different organisations (total of six documents).

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1 create new information that is clear, easy to understand, uses a suitable style and is at a level that suits the intended readers</td>
<td>C1 achieve a coherent and consistent style, made good use of standard formats, place information in appropriate positions and ensure correct and meaningful content by presenting original draft copies with proof reading corrections and annotations</td>
<td>A1 demonstrate a good understanding of writing style, presentation techniques, standards for special documents and attention to detail, by organising a variety of different types of information into a single coherent, imaginative, easy to read presentation of several pages</td>
</tr>
<tr>
<td>E2 use text styles, page layout, paragraph formatting and, where appropriate, common standards for layout that suit the purpose of each document</td>
<td>C2 describe in detail the content, layout and purpose of the six collected documents, accurately evaluating good and bad points about the writing and presentation styles of similar items, commenting on suitability for purpose and suggesting how improvement could be made</td>
<td>A2 demonstrate effective skills in the appropriate use of software facilities to automate aspects of your document production, such as bullets and numbering, paragraph and heading styles, standardised layout, contents lists and indexes</td>
</tr>
<tr>
<td>E3 use and combine text, graphics, tables, borders and shading effectively</td>
<td>C3 work independently to produce your work to agreed deadlines.</td>
<td>A3 make appropriate use of lines, borders, shading, tables, graphics and writing style to create a form that is easy to understand and easy to use to enter data and retrieve the information collected</td>
</tr>
<tr>
<td>E4 locate, use and adapt existing information to suit a presentation and list your information sources in an appropriate form</td>
<td></td>
<td>A4 demonstrate effective skills in the use of graphics to improve a presentation by making appropriate use of pictures, drawings, clip art, lines and borders, graphs or charts.</td>
</tr>
<tr>
<td>E5 describe each of the six collected documents clearly and accurately, identifying the common elements of similar documents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E6 carefully check the accuracy of the layout, content of your six original documents and your report and proof-read to ensure that few obvious errors remain</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7.4 Essential Information for Teachers

Guidance on delivery

The original documents, in particular the major document, may be produced while students are working for other units, for example Unit 2: ICT Serving Organisations and Unit 5: Systems Analysis. The major document may be on any topic, preferably one of interest to students. It must have enough scope to show their skills. Students will need to practise their skills and produce many documents before they are ready to produce their best quality work for their portfolios.

The importance this unit attaches to accuracy and suitability should ensure that students spend much time thinking about the quality of what they wish to communicate, then presenting it simply and clearly. The content of documents is the key to their importance. This unit focuses on the quality of that content, but students also learn from experience and guidance how to improve their presentations by using techniques like white space.

Acquaintance with documents from different organisations enables students to examine the quality of communication for a wide range of different types of document. There are numerous real examples of business documents that are stilted, tortuous or simply ineffective. It may be useful to build a bank of business clichés extracted from business documents, for students to translate into plain English. Typical documents are:

- bills
- letters advertising financial products, such as credit cards and investments
- mail order forms and letters
- instructions for operating domestic equipment
- conditions of contracts, such as for credit cards, digital TV or hire purchase (HP) agreements
- insurance documents, letters and conditions
- advertisements in newspapers and magazines.

While students need to spend a lot of time practising techniques, they should also discover tools that can improve their writing. They should configure grammar checkers to use different writing styles and then use them to check a written document to see if each gives a different response.

Tasks should not become checklists for techniques. The key to success is for students to use a variety of suitable techniques and use them sensibly. A wide choice of documents should ensure variety, but there is no need to drag in every technique listed in What You Need to Learn.
Group work brings enormous benefits to students. They could work in a group to collect documents, with each student contributing half a dozen cuttings or pamphlets and a critique of what they have collected. A discussion should help to generate ideas about what constitutes good and bad style. There should be no problem about authenticity if each student writes individual comments on a sample of the group’s collection. When linked to presentational techniques, these activities should help students to write and present their work clearly, succinctly and effectively.

**Guidance on assessment**

The result of your assessment of candidate evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification which in turn is used to generate a qualification grade.

The mark you award must take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark you determine for a particular candidate is based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements you should consider the following general qualities that distinguish between the grades:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.

**Grade E**

To achieve an E grade, candidates should aim to provide evidence that covers all the requirements stated in the E grade criteria of the assessment grid. It may be, however, that a candidate demonstrates considerable effort and skill in some areas at the expense of precise detail in another. Professional judgement should be used to decide what is a reasonable expectation of candidates and whether the stated quality and sufficiency requirements have, on balance, been met.

Candidates must produce documents that are suitable for their purpose and use different writing styles and layouts that work effectively to serve that purpose. Some documents must contain a variety of information types, including graphics and tables. These elements should be combined in an ordered manner. Elementary typographical skills should be demonstrated in the choice and use of fonts and the formatting of text.

Candidates should make effective use of spell-checkers and other aids, together with careful proof-reading, to achieve reasonably accurate content.

Information originated by the candidate must be clear and easy to understand and written in an appropriate style. It must also be written at an appropriate level to suit the intended readers.
Candidates must show they have carefully checked the accuracy of the document content and its layout and kept backup copies of files. Proof-reading must be more than just correcting spelling errors. Candidates should find and correct repeated or incorrectly used words. Complete freedom from errors is not essential, but most obvious errors should be removed.

**Grade C**

To achieve a C grade, candidates’ documents must be of good quality with layout and content well matched to purpose. Candidates must use clear, consistent and appropriate style throughout each document and should make good use of standard formats to achieve an effective presentation.

Candidates should be able to make good use of document creation software. Draft copies of the long document will show how a standardised format and an appropriate and consistent style were achieved.

The notes describing the content, layout and purpose of the six collected documents should show more than a superficial understanding of the design layout used. They should clearly identify the important features of the different documents and highlight differences, giving possible reasons for variations.

Candidates should be able to accomplish ordinary tasks without support and help. They should be able to find and use options for formatting, creating tables and importing graphics.

When candidates have acquired the necessary knowledge and understanding, they should plan carefully and work independently to meet a given deadline. This requirement does not mean without teacher intervention or assistance, rather it means that candidates do not display undue dependence. The agreed deadline may be renegotiated between the candidate and teacher to take into account unforeseen circumstances.

**Grade A**

To achieve a grade A candidates should produce at least one well-written and well-presented document of several pages. This should show they have paid particular attention to detail, such as layout and removal of errors. It will also show a good understanding of writing style.

Their other documents will be accurate, well written and fairly comprehensive. The choice of fonts for body text and headings, etc will be well matched to the purposes of the documents and elements will be carefully and consistently positioned. Documents should give an overall impression of having been designed for a purpose.

Candidates’ evaluation of documents acquired from different organisations will be clear, accurate, detailed, coherent and easy to read. Candidates will compare the different documents, discussing suitability for purpose, presentation style and layout. They will use appropriate and fluent technical language, identifying good qualities in the documents and poor features that need to be improved, together with suggestions for such improvement.
7.5 Resources

Students must have access to word processing and/or desktop publishing software.

7.6 Key Skills Guidance

This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole AS or Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

**Keys to attainment**

These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.

**Signposts**

These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Students will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.

7.7 Communication Level 3

**Keys to attainment**

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing six original documents in different forms, choosing and using different writing styles, language and layout to suit different purposes and checking accuracy of writing</td>
<td>C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image.</td>
</tr>
</tbody>
</table>
### Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• discussing their documents</td>
<td>C3.1a Contribute to a group discussion about a complex subject.</td>
</tr>
<tr>
<td>• creating a screen presentation, structuring the information and ideas and using techniques such as transitions</td>
<td>C3.1b Make a presentation about a complex subject, using at least one image to illustrate complex points.</td>
</tr>
<tr>
<td>• collecting information from different sources and extracting key information to include in documents</td>
<td>C3.2 Read and synthesise information from two extended documents about a complex subject. One of these documents should include a least one image.</td>
</tr>
</tbody>
</table>

7.8 **Application of Number**  
Level 3

### Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing documents including charts, graphs and tables</td>
<td>N3.1 Plan, and interpret information from two different types of sources, including a large data set.</td>
</tr>
<tr>
<td>• using charts, graphs and tables</td>
<td>N3.3 Interpret results of their calculations, present their findings and justify their methods. They must use at least one graph, one chart and one diagram.</td>
</tr>
</tbody>
</table>

7.9 **Working with Others**  
Level 3

### Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing six original documents</td>
<td>WO3.1 Plan complex work with others, agreeing objectives, responsibilities and working arrangements.</td>
</tr>
<tr>
<td>• collecting documents</td>
<td>WO3.2 Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives.</td>
</tr>
<tr>
<td></td>
<td>WO3.3 Review work with others and agree ways of improving collaborative work in the future.</td>
</tr>
</tbody>
</table>
### 7.10 Improving Own Learning and Performance Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
</table>
| • planning, carrying out and reviewing their work with advice/support from others | LP3.1 Agree targets and plan how these will be met over an extended period of time, using support from appropriate people.  
LP3.2 Take responsibility for their learning by using their plan, and seeking feedback and support from relevant sources, to help meet targets.  
LP3.3 Review progress on two occasions and establish evidence of achievements, including how they have used learning from other tasks to meet new demands. |

### 7.11 Problem Solving Level 3

**Keys to attainment**

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• planning the production of the documents, evaluating the documents</td>
<td>PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach as necessary.</td>
</tr>
</tbody>
</table>

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
</table>
| • planning the production of the documents, evaluating the documents | PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward  
PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving. |
8.1 About this Unit

This unit helps you to:

• understand how organisations are structured
• understand how organisations use and exchange information
• evaluate how well ICT can and does help organisations
• consider how ICT supports many different activities in organisations
• see how ICT offers new opportunities, such as just-in-time stock management.

You will produce a case study on how an organisation collects, disseminates and uses information, how it manages the flow of information between sections or departments and the way it uses ICT to access and exchange information.

This unit links with Advanced Units 1: Presenting Information, 3: Spreadsheet Design, 5: Systems Analysis and 6: Database Design.

This unit is assessed through an external assessment. You will produce a case study that will be externally marked. The grade on that assessment will be your grade for the unit.

8.2 What You Need to Learn

The topics are:

• types of organisation
• functions within organisations
• information and its use
• management information systems
• standard ways of working.

Types of organisation

In all types of organisations, a group of people work together to make something or provide a service. The range includes multinational commercial companies, national companies, public limited companies (plc), utilities, e.g. transport, water, electricity and gas, public service organisations, e.g. hospitals, schools, colleges, shops, banks and a range of enterprises employing small numbers of people that can be found in every town.
You will need to learn who organisations communicate with, what information they exchange and how ICT is used to support such communication. Different organisations exchange different types of information about different things. You will need to learn about the types of information that may be exchanged between or about the following:

- customers and clients
- wholesalers and retailers
- distributors
- suppliers (of services or goods)
- manufacturers
- managers and employees
- products
- briefs
- services
- goods.

Functions within organisations

Most organisations have staff who have particular responsibilities, such as dealing with sales, creating products or services, or undertaking research and development. These tasks are often known as job functions.

You will need to learn about the many different job functions that can appear in organisations, including:

- accounts or finance
- sales
- distribution
- marketing
- research and development
- human resources
- design
- production (or service provision)
- ICT services
- administration.

You need to learn that organisations are often structured into departments for these functions and that there will be a manager for each department. You need to understand how ICT can be used in these departments by learning what they do and who they need to communicate with.

You will need to be able to identify team organisation, delegation and employee participation and how they affect the need for information.
Information and its use

Organisations need to communicate to people within the organisation as well as those outside, such as suppliers and customers. Finding out who needs information, who sends it, who receives it, how it is processed and how ICT is used to support these activities will tell you a lot about how an organisation works.

It is common to see a number of different ICT systems within an organisation, each designed to manage different types of information. Often, some of these systems will not link to other systems within the organisation.

You may find that it can be inefficient and even damaging to an organisation to have isolated ICT systems. An example is where sales personnel use a different customer database from the accounts or distribution departments, requiring three times as much work to keep them all up to date compared with a single database.

Most large organisations use very similar key information. You need to understand how organisations use this information. You must also be able to identify typical features of such information including that relating to:

- personnel and training
- accounts, finance and payroll
- research, design and development
- sales and purchase orders
- stock control
- internal e-mail
- Internet and intranet
- product manufacture.

You must be able to draw diagrams that help you describe the movement of information in these organisations, including information flowing into and out of the organisation and between departments. This involves finding who needs or uses what information and then showing the connections.

The type of information should be clearly identified in the diagrams. The following types might appear:

- customer orders
- purchase orders to suppliers
- design and production drawings
- wages and tax paid details
- records of staff training
- names and addresses of employees
- stock details
- invoices paid
• monthly income
• monthly outgoing
• web publicity pages
• monthly profit or loss.

Your diagrams should show the methods used for communicating information, including:

• face-to-face
• documents via internal or external post
• EDI or e-commerce
• LAN or Internet e-mail
• telephone
• facsimile
• centralised database systems.

You will need to find out which methods are effective and efficient for different organisations. You will also need to find out which methods are particularly effective for different types of information.

Management information systems (MIS)

Management information systems help managers to plan, organise and make decisions. These systems can provide managers with a variety of different types of information or support, such as easy to understand tables, responses to direct queries, graphical output, output resulting from the input of a ‘what if’ scenario or even a warning signal as a result of data exceeding a set limit.

Typical systems could include:

• a comprehensive database holding all the different types of information processed by the organisation that regularly provides managers with ready-made reports
• the analysis and comparison of data in the database over a period of time to provide information in graphical form about items such as sales, purchases, wages or stock levels
• warning signals to indicate that decisions are required, such as low stock levels, expenditure exceeding income, numbers of faulty products exceeding expectations
• daily calculation of productivity levels by analysis of costs and output
• monthly graphs of price comparison with competitor goods or services resulting from regular market research
• audio and visual warnings when incoming orders exceed production capacity
• a model of the organisation that enables ‘what if’ queries to be input to forecast the effects of items such as policy decisions, market conditions, production rates, VAT or tax changes.
You will need to be able to study organisations to determine:

- what information it relies on
- how it processes that information
- whether a management information system would be useful
- what specific purpose it could serve
- the information necessary to enable it to operate
- how the ICT system could best provide the management information required.

Standard ways of working

**Note:** See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You must learn to:

- edit and save work regularly, using appropriate names for your documents
- store your work where you and others can easily find it
- keep dated backup copies of files on another disk and in another location
- keep a log of ICT problems you met and how you solved them
- protect confidentiality and observe copyright laws
- avoid bad posture, physical stress, eye strain and hazards from workplace layout.
### 8.3 Assessment Evidence for Unit 2: ICT Serving Organisations

You must produce a case study (report) analysing a suitable organisation.

The assessment materials for this unit will be provided by AQA.

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>E1</strong> describe clearly, with the aid of diagrams, the main function(s) of the organisation, its associated customers (or clients) and suppliers, the function of each department, the structure of the organisation and the relationships between the main departments and outsiders</td>
<td><strong>C1</strong> produce a well-structured case study that shows fluent use of technical language, contains appropriate conclusions and makes suitable references to the information sources used</td>
<td><strong>A1</strong> explain in detail, with the aid of diagrams and definitions of the data, how information moves from a customer or client through the organisation to result in the delivery of a product or service</td>
</tr>
<tr>
<td><strong>E2</strong> describe the ICT provision for each of the organisation’s departments (or functions) and identify possible extensions or improvements to the use of ICT that would benefit the organisation</td>
<td><strong>C2</strong> explain in detail how information used in the organisation is processed including details of the data capture techniques, any processing or calculations involved and the specification and style of data output</td>
<td><strong>A2</strong> use examples to recommend improvements to the organisation’s internal ICT systems (this may cover items such as integration of existing systems, specialised equipment or software, database development, LAN or WAN systems)</td>
</tr>
<tr>
<td><strong>E3</strong> demonstrate clearly, using diagrams, how information essential to successful operation moves within the organisation and to and from outsiders</td>
<td><strong>C3</strong> work independently to produce your work to agreed deadlines.</td>
<td><strong>A3</strong> describe in detail how the organisation might benefit from more extensive use of new communication technologies, such as the Internet, mobile communications, e-mail, e-commerce or EDI</td>
</tr>
<tr>
<td><strong>E4</strong> describe in detail the purpose and operation of an important ICT application used within the organisation, including examples of input and output data and the job functions and personnel involved</td>
<td></td>
<td><strong>A4</strong> describe how the organisation might use a management information system to monitor or control activities, improve decision making and improve efficiency.</td>
</tr>
<tr>
<td><strong>E5</strong> present your case study clearly as a coherent report and check it for meaning and accuracy.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8.4 Essential Information for Teachers

Guidance on delivery

The assessment materials and associated documentation for this unit will be provided by AQA. The case study produced for external assessment should be based on one organisation. Teachers should encourage students to investigate an organisation that will provide them access to the full range of assessment criteria.

The work carried out by the students as preparation for the external assessment should cover a range of different types of ICT activities and organisations. This work could be carried out through visits to local organisations. Where this is not possible, case studies of a variety of different organisations could be created and used. At least one large organisation must be covered. It will be necessary to provide a wide range of example documents and information about the organisation for each case study. These will need to include items such as:

- definitions of the purpose and objectives of the organisation
- documents that show how information flows, e.g. letters, memos, orders and invoices
- charts that show the organisational structure
- details of products manufactured, goods sold or services provided
- details of the ICT facilities available in each job role
- details of the departments and their role

The case study produced by students for assessment will obviously need to be different from those used for classroom study purposes. Typical organisations with potential for study are:

- large retailers, such as clothes, grocery or computer product shops
- manufacturers of goods, such as cars, electrical goods or steel products
- providers of services, such as railways, bus companies, solicitors, councils and police
- schools, colleges and libraries.

To be able to produce comprehensive diagrams of information flows, students will need to be able to identify different systems. They will need to learn about the following functions and the key systems used by many large organisations:

- **personnel** – will contain information about employees, such as name, address, employee number, and position. There are often links with training and payroll
- **training** – training records are an extension of the personnel system. Large organisations will probably record training plans for employees. The records may also note special skills of staff so they can be found quickly when particular skills are required
• **payroll** – another extension of personnel records. Tax codes and rates of pay will link to the employee number. Often there is a computerised mailing system that prints letters with details of wage payments. Payroll is one area in an organisation that deals with many changes, for example staff turnover, changes to personal details and changes to pay rates. It is also one in which confidentiality of information is particularly important. An important external link is with the Inland Revenue. Reports on payroll information must be available to accounts managers to contribute to statements of profits and losses.

• **design and development** – records of changes to product design or to new products. They will also need to produce specifications for all products. These may include production drawings.

• **purchasing** – this department links with stock control, accounts, production and most other departments. It will generate purchase orders and contracts for goods and services.

• **sales** – keep records of all customer orders. They initiate the internal requests for provision of services or goods. These may be sent to a dispatch or delivery department.

• **research** – keeps records of new products on trial or being investigated. They may be able to forecast how long existing products will remain saleable. They may define new areas of productivity for the organisation.

• **accounts and finance** – this department tracks money paid and money owed. It prepares a general ledger summarising accounts. This allows the preparation of balance sheets and income statements. Financial systems keep track of cash receipts and payments. They will be used to forecast cash flow.

• **stock control** or inventory systems – track items held in stock by serial number. They record the number, cost and location of items held in stock. Often there will be an automatic re-ordering process. Sometimes there will be links with robotic systems in warehouses. These systems can automate much of the re-stocking necessary.

• **e-mail** – used extensively to communicate information within the organisation and with external contacts. It is useful for organising meetings as staff can post their availability on the system. Problems can arise if too little care is taken to decide who receives what information.

• **Internet and intranet** – these offer completely new opportunities that you need to consider. Some are external, in that they open websites for outsiders to explore. Some are internal, providing closed network facilities. An important aspect is e-commerce which is used to buy and sell goods and services on line. These topics are covered in more detail in optional units.
Guidance on assessment

This unit is externally assessed. Sample assessment materials for the unit may be obtained from AQA. Candidates should be encouraged to use these materials to assist them in preparing for the external assessment.

The result of the external assessment of candidate evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification which in turn is used to generate a qualification grade.

The mark awarded will take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark determined for a particular candidate based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements the following general qualities that distinguish between the grades will be considered:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.

Grade E

To achieve an E grade, candidates should aim to provide evidence that covers all the requirements stated in the E grade criteria of the assessment grid. It may be, however, that a candidate demonstrates considerable effort and skill in some areas at the expense of precise detail in another. Professional judgement will be used to decide what is a reasonable expectation of candidates and whether the stated quality and sufficiency requirements have, on balance, been met.

Candidates’ case studies must describe clearly the main function of the organisation and its associated customers or clients and suppliers. It will need to describe and explain what each department in the organisation does and should include an organisation chart that shows the structure of the organisation and relationships between departments and outsiders.

Candidates will need to describe the ICT equipment used by the organisation and specify the ICT provision for each department, including a detailed description of an important ICT application, such as order processing, stock management, production scheduling, financial forecasting and e-commerce activities. They must also identify possible improvements that could be made. Suggestions such as using a more up-to-date processor or a colour printer are inappropriate on their own. The suggestions should be based on the purpose, nature and needs of the organisation and related to the efficiency of acquiring data, processing it and providing more suitable output.

Candidates must show clearly how information that is essential to the success of the organisation is acquired from outside and how it is processed. They must also be able to describe the advantages and disadvantages of using ICT systems within the organisation.
Proof-reading and correction of most errors in documents is essential. Proof-reading must be more than just correcting spelling errors, candidates should find and correct repeated or incorrectly used words. Complete freedom from errors is not essential, but most obvious errors should be removed.

**Grade C**

To produce a well-structured case study, candidates must produce a plan showing in detail the intended contents and the information sources they intend to use.

Candidates must explain in some detail, using diagrams and definitions of the data, how some of the information used in the organisation is processed, including details of the data capture techniques, any calculations involved and the specification and style of data output.

They should work independently to meet a given deadline, once they have acquired the necessary knowledge and understanding. This requirement does not mean without teacher intervention or assistance, rather it means that candidates do not display undue dependence. The agreed deadline may be re-negotiated between the candidate and teacher to take into account unforeseen circumstances.

**Grade A**

Candidates’ case studies will be comprehensive and will be coherent and easy to read.

Their recommendations to improve ICT systems will be supported by clearly defined examples.

Their recommendations and descriptions of communications technology and management information systems will show appropriate and fluent use of technical language.

---

**8.5 Resources**

Students should have access to an appropriate organisation ideally through an individual/group visit or work placement.

**8.6 Key Skills Guidance**

This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole AS or Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

**Keys to attainment**

These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the Key Skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.

**Signposts**

These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Candidates will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.
8.7 Communication Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• researching information flow within an organisation</td>
<td>C3.2 Read and synthesise information from two extended documents about a complex subject. One of these documents should include at least one image.</td>
</tr>
<tr>
<td>• producing a case study report, with diagrams showing the functions of the organisation, suppliers, departments, departments and relationships and the movement of information</td>
<td>C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image.</td>
</tr>
</tbody>
</table>

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• present your case study</td>
<td>C3.1b Make a presentation about a complex subject, using at least one image to illustrate complex points.</td>
</tr>
</tbody>
</table>

8.8 Application of Number Level 3

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• gathering information on the ICT provision for inclusion in the case study</td>
<td>N3.1 Plan, and interpret information from two different types of sources, including a large data set.</td>
</tr>
</tbody>
</table>
### 8.9 Working with Others Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• investigating the ICT within an organisation</td>
<td>WO3.1 Plan complex work with others, agreeing objectives, responsibilities and working arrangements.</td>
</tr>
<tr>
<td>• identifying how information moves within the organisation</td>
<td>WO3.2 Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives.</td>
</tr>
<tr>
<td></td>
<td>WO3.3 Review work with others and agree ways of improving collaborative work in the future.</td>
</tr>
</tbody>
</table>

### 8.10 Improving Own Learning and Performance Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing a case study on a suitable organisation</td>
<td>LP3.1 Agree targets and plan how these will be met over an extended period of time, using support from appropriate people.</td>
</tr>
<tr>
<td></td>
<td>LP3.2 Take responsibility for their learning by using their plan, and seeking feedback and support from relevant sources, to help meet targets.</td>
</tr>
<tr>
<td></td>
<td>LP3.3 Review progress on two occasions and establish evidence of achievements, including how they have used learning from other tasks to meet new demands.</td>
</tr>
</tbody>
</table>

### 8.11 Problem Solving Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• identifying and analysing the purpose and operation</td>
<td>PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward.</td>
</tr>
<tr>
<td>of ICT in an organisation</td>
<td>PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach as necessary.</td>
</tr>
<tr>
<td>• producing a case study</td>
<td>PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving.</td>
</tr>
</tbody>
</table>
9.1 About this Unit

This unit helps you to:

- design spreadsheets that process data and present required information
- prepare standard spreadsheets that others can use with their own data
- learn and apply good design and test principles.

You will create a spreadsheet to meet specified requirements. The specified requirements will require the use of several of the more complex spreadsheet facilities.

This unit applies some of the knowledge and skills gained from Unit 1: Presenting Information. It links with Units 5: Systems Analysis, 6: Database Design and 16: Programming.

This unit is assessed through your portfolio work. The grade on that assessment will be your grade for the unit.

9.2 What You Need to Learn

The topics are:

- developing a working specification
- using spreadsheet facilities
- designing and developing spreadsheets
- presenting spreadsheet information
- testing spreadsheets
- documentation
- standard ways of working.

You will meet new technical terms in each of these topics. Some of the words may be familiar but have specialised meanings in this area of study. You need to know how to use these terms correctly.

Developing a working specification

You will need to be able to create spreadsheets that meet specified requirements. The user of your spreadsheet will want to enter data and the spreadsheet must process the data to produce the required output. Output may be in the form of numerical values or charts.

You need to learn how to analyse user requirements to determine:

- what output information they want
- how they currently obtain that information (if at all)
- where the data to be input is to come from
- what data capture methods can be used
• what data processing must be done to get the required output
• what aids can be provided to assist with data input or processing
• how the output information needs to be presented.

You will need to be able to use the answers to these questions to produce a detailed design specification for the spreadsheet. You will find it helpful to discuss with others the user’s requirements and how they may be met. A good design specification states the user’s needs in such a way that there is no doubt about the scope of the task and the work that has to be done.

You and the user need to agree the design specification before you begin work on the spreadsheet design.

Using spreadsheet facilities

When using spreadsheet facilities, there are a number of activities that you will do regularly. You must learn to carry out these activities without help, including:

• selecting and setting cell formats to match the data format
• selecting and using suitable cell presentation formats
• using and manipulating spreadsheet data
• appropriately using cell referencing facilities
• correctly applying and using operators and formulae
• appropriately using built-in spreadsheet functions
• using wizards.

You will need to learn how to do the following activities:

set cell formats to match the data format, including:

• decimal number
• integer number
• percentage
• date
• fraction
• text or character
• currency
• scientific
• custom or special

set cell presentation formats, including:

• horizontal alignment
• vertical alignment
• shading
• fonts
• borders

use and manipulate your spreadsheet to:

• find data
• go to a specified cell
• search and replace data
• cut, copy, paste, move
• clear cell formats/contents
• use paste special
make appropriate use of cell referencing facilities, including:

- relative referencing
- absolute cell referencing
- mixed cell referencing
- cell ranges
- 3D referencing
- R1C1 referencing

correctly apply and use the following operators in formulae:

- arithmetic operators, such as +, -, *, /, %, ^
- relational operators, such as =, <, >, >=, <=, <>
- the logical value FALSE, TRUE
- text concatenation & or +
- the use of parentheses ().

use common built-in spreadsheet functions, including:

- SUM
- AVERAGE
- SQUARE
- INT
- RAND
- IF
- COUNT
- MODE
- MEDIAN
- MAX
- MIN
- DATE.

Designing and developing spreadsheets

The design of the spreadsheet must make it easy to use. In creating a spreadsheet for users you should provide simple but effective ways of entering data, including:

- creating sheets that have the appearance of a form
- using data entry forms.

You should provide users with helpful prompts, including:

- providing data entry messages
- using data validation and associated messages.

You will need to present results appropriately, including good use of:

- cell formatting, such as colour and borders
- drawing tools and graphic images
- charts and line graphs.

You will need to make good use of macros to simplify the use of the spreadsheet, including macros that:

- replace multiple key depressions for a required action
- enable or simplify data input
- produce printed or screen reports.
You will need to be able to use some of the more complex spreadsheet facilities including:

- lists and tables – sorting, lookup tables, subtotals and totals
- list boxes and drop-down boxes to select data for entry
- styles to create a customised cell format
- named cells and ranges for use in formulae
- auto-fill lists, for lists of dates or days of the week
- validation – restricting data input to acceptable data values
- templates – creating standard spreadsheet layouts for repeated use
- protecting cells by hiding and locking cells
- sort, to sort single and multiple columns of data
- control buttons, to initiate macros
- multiple sheets with links between them
- multiple views or windows.

Presenting spreadsheet information

The presentation of information in your spreadsheet is very important and you must consider this from the start. To present results in appropriate ways, on VDU screens and on printed pages, you must be able to make suitable use of cell formats, page layout, charts and line graphs.

You must be able to create an appropriate page layout, including:

- margins
- headers
- footers
- page size
- page orientation

You need to present results in graphical form, including:

- line graphs
- bar charts
- pie charts
- using picture markers
- scatter charts

You should present charts and line graphs appropriately, including using:

- chart or graph title
- axis labels
- background
- legend data series label
- data labels
- category labels
- axes formats
- axis values
- gridlines

You should make use of built-in drawing tools and other facilities to improve your presentation, including:

- grouping objects
- object formatting
- graphic lines and shapes
- object positioning
- text boxes
- object sizing
You must learn to test your spreadsheets thoroughly. You can do this by asking yourself questions such as:

- does the solution meet the agreed specification?
- do results agree with manual methods of doing the same problem?
- does the spreadsheet cope with normal, extreme and abnormal/erroneous data?
- can other people use the solution?
- is the spreadsheet robust or can it be made to fail?

You will need to be able to create a test specification that defines tests for:

- acceptable data input values (both maximum and minimum)
- unacceptable data values that should be automatically rejected
- checking, independently, that all functions and formulae work correctly
- checking that the system meets user requirements.

You must learn to document the development of your customised spreadsheet and create instructions for users.

Technical documentation is for specialists. It records the design and development of the spreadsheet and could include:

- a copy of the agreed design specification
- details of the hardware, software and other resources required
- instructions for opening and configuring the spreadsheet
- details of all calculations, formulae and functions used
- details of validation and verification procedures
- details of all input and output screens and printed designs
- copies of the test specification.

User documentation helps others to use your custom spreadsheet. You must learn to write user instructions that are simple to understand. Your instructions could include:

- how to start the spreadsheet program
- routes through the spreadsheet menus
- examples of screens and data entry forms
- instructions about data entry
- advice on how to respond to error messages or conditions
- examples of data output screens and printed copy.
Standard ways of working

Note: See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements, written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You need to learn to:

• edit and save work regularly, using appropriate names for your documents
• store your work where you and others can easily find it
• keep dated backup copies of files on another disk and in another location
• keep a log of ICT problems you met and how you solved them
• protect confidentiality and observe copyright laws
• avoid bad posture, physical stress, eye strain and hazards from workplace layout.
### 9.3 Assessment Evidence for Unit 3: Spreadsheet Design

**You must produce:**
- a spreadsheet solution to meet specified user requirements, involving the use of at least six of the more complex spreadsheet facilities
- user and technical documentation, including a test report.

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1 produce a clear design specification that meets user requirements, including appropriate selection of more complex facilities, details of sources of data, outline screen data entry forms, calculations required, user aids to operation and how output is presented</td>
<td>C1 demonstrate a good understanding of spreadsheet design and attention to detail by creating an imaginative customised spreadsheet that makes good use of design and layout facilities</td>
<td>A1 demonstrate a good understanding of the purpose and value of more complex facilities by using them effectively in your spreadsheet design</td>
</tr>
<tr>
<td>E2 provide suitable data entry facilities including input messages and macros that reduce keystrokes and improve user efficiency</td>
<td>C2 produce detailed test specifications together with examples of a full range of acceptable and unacceptable input, associated expected output and any associated error messages</td>
<td>A2 provide customised data input using facilities such as forms, dialogue boxes and list boxes that are clear, well laid out, suitably labelled and validate data input</td>
</tr>
<tr>
<td>E3 provide suitable printed or screen output that makes appropriate use of cell formats, charts or graphs, page or screen layout and graphic images</td>
<td>C3 work independently to produce your work to agreed deadlines.</td>
<td>A3 produce comprehensive records of spreadsheet drafting, testing and refinement that show how the spreadsheet was developed and how any problems were resolved</td>
</tr>
<tr>
<td>E4 provide clear technical documentation identifying formulae and functions used, and screen and printed report layouts</td>
<td></td>
<td>A4 produce high-quality, clear user documentation making good use of graphic images in detailed instructions for use together with examples of menus and data input screens, types of output available and possible error messages.</td>
</tr>
<tr>
<td>E5 provide clear user documentation with copies of menus and screens and examples of input and output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E6 test your spreadsheet against the design specification and carefully check the accuracy of the data used and the output generated.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9.4 Essential Information for Teachers

Guidance on delivery

Students will need to practise various skills and solve many small and varied problems before they are ready to undertake a major task. Together, these problems should require students to use all the spreadsheet skills described. For the final spreadsheet, students should use only those techniques relevant to its solution. Clearly, however, the task must be sufficiently weighty to go beyond sums and averages.

Students should experience a wide variety of different types of spreadsheet, particularly those of a business nature such as those used for invoices, for quotations and in stock control systems.

The order of teaching different topics is unimportant. What does matter is that students see that the presentation of a spreadsheet is as important a part of design as thinking about which spreadsheet functions will be most useful in solving a problem.

Some time should be spent considering the layout of data input screens. Students should devise some screens that appear as forms, such as invoices and records of contacts. They should investigate the many ways in which a user can be guided to enter the correct data in any one cell. This would include the use of cell messages. They should also learn to create suitable validation for the entry of data as well as error messages to inform users of mistakes.

Students may gain from contributing to a team project before they try to produce a spreadsheet for assessment. Each team member could be allocated a separate role, such as designing input screens, processing data, presenting information and writing a user guide. The sharing of such experiences should help students to see the benefits of teamwork and the value of breaking major tasks down into smaller, manageable chunks.

Guidance on assessment

The result of your assessment of student evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification which in turn is used to generate a qualification grade.

The mark you award must take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark you determine for a particular student is based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements you should consider the following general qualities that distinguish between the grades:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.
Grade E  To achieve an E grade, students should aim to provide evidence that covers all the requirements stated in the E grade criteria of the assessment grid. It may be however that a student demonstrates considerable effort and skill in some areas at the expense of precise detail in another. Professional judgement should be used to decide what is a reasonable expectation of students and whether the stated quality and sufficiency requirements have, on balance, been met.

Candidates must produce a clear design specification. This will need to include details of where they obtained their information for entry into the spreadsheet. They will need to describe how they enable data entry, such as the use of data entry forms, what calculations are necessary, the formulae used and any aids to the user such as messages, validation cells and macros.

Candidates should create spreadsheets that have the appearance of forms such as invoices. These forms must make appropriate and attractive use of cell formats, charts, line graphs, page or screen layout and graphic images. They may be both input and output forms.

The technical and user documentation must provide clear details of the operation of the spreadsheet. It must include details of the formulae used, the cell formatting, examples of screens used and typical input and output. Candidates must show that they have correctly tested their spreadsheets against the design specification.

Grade C  To achieve a C grade the candidate’s spreadsheet should make good use of design and layout facilities and be suitably customised to meet user needs. Candidates must provide clear and easy to use data input facilities, such as forms, dialog boxes and list boxes, and these must be well laid out and suitably labelled.

They must proof-read and correct most errors in their documentation. Candidates should show clear records of thorough spreadsheet testing and indicate how identified problems were resolved. Their user documentation will make good use of graphic images including examples of data input screens, types of output available and possible error messages.

They should plan their work and work independently to meet a given deadline, once they have acquired the necessary knowledge and understanding. This requirement does not mean without teacher intervention or assistance, rather it means that students do not display undue dependence. The agreed deadline may be re-negotiated between the candidate and teacher to take into account unforeseen circumstances.

Grade A  For this grade, candidates’ design specifications and technical documentation will be coherent, comprehensive, will contain appropriate and fluent technical language and be easy to read. These, together with their spreadsheet, will show an in-depth understanding of spreadsheet design.

The candidates will pay attention to detail by creating an imaginative customised spreadsheet making good use of design and layout facilities available to them including validation of input.
They will produce detailed test specifications together with examples of a full range of acceptable and unacceptable input and associated expected output. They will define fully and clearly in the technical documentation all functions, formulae and validation techniques and the design of all user screens and dialog boxes.

9.5 Resources

Students must have access to spreadsheet software with the functions and features detailed in the unit.

9.6 Key Skills Guidance

This is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole AS or Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

Keys to attainment

These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.

Signposts

These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Students will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.

9.7 Communication Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing clear technical and user documentation, including images of the spreadsheet</td>
<td>C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image.</td>
</tr>
</tbody>
</table>

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• discussing user requirements</td>
<td>C3.1a Contribute to a group discussion about a complex subject.</td>
</tr>
</tbody>
</table>
9.8 Application of Number Level 3

**Keys to attainment**

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• collecting information for the design of the spreadsheet and for test purposes</td>
<td>N3.1 Plan, and interpret information from two different types of sources, including a large data set</td>
</tr>
</tbody>
</table>

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• designing the spreadsheet</td>
<td>N3.2 Carry out multi-stage calculations to do with:</td>
</tr>
<tr>
<td></td>
<td>a. amounts and sizes;</td>
</tr>
<tr>
<td></td>
<td>b. scales and proportion;</td>
</tr>
<tr>
<td></td>
<td>c. handling statistics;</td>
</tr>
<tr>
<td></td>
<td>d. re-arranging and using formulae.</td>
</tr>
<tr>
<td>• creating the spreadsheet</td>
<td>They should work with a large data set on at least one occasion.</td>
</tr>
<tr>
<td></td>
<td>N3.3 Interpret results of their calculations, present their findings and justify their methods. They must use at least one graph, one chart and one diagram.</td>
</tr>
</tbody>
</table>

9.9 Working with Others Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing a spreadsheet to meet specified requirements</td>
<td>WO3.1 Plan complex work with others, agreeing objectives, responsibilities and working arrangements</td>
</tr>
<tr>
<td></td>
<td>WO3.2 Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives</td>
</tr>
<tr>
<td></td>
<td>WO3.3 Review work with others and agree ways of improving collaborative work in the future.</td>
</tr>
</tbody>
</table>
### 9.10 Improving Own Learning and Performance Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
</table>
| producing a spreadsheet solution to meet specified user requirements | LP3.1 Agree targets and plan how these will be met over an extended period of time, using support from appropriate people.  
LP3.2 Take responsibility for their learning by using their plan, and seeking feedback and support from relevant sources, to help meet targets.  
LP3.3 Review progress on two occasions and establish evidence of achievements, including how they have used learning from other tasks to meet new demands. |

### 9.11 Problem Solving Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
</table>
| producing a clear design specification that meets user requirements  
testing the spreadsheet against the design specification | PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward.  
PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach as necessary.  
PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving. |
10.1 About this Unit

This unit helps you to:

- acquire an understanding of ICT system components and their purpose
- specify the components of an ICT system to meet user needs
- install and configure ICT systems
- install, configure and test new hardware
- install, configure and test new software
- configure systems to meet user needs
- understand and implement safety and security procedures.

You will set up a working computer system to meet a given specification. This activity may be undertaken with a small group of colleagues. You will also undertake modifications to the hardware and software of existing systems and create and maintain comprehensive records of all your practical activities.

This unit links naturally with Unit 7: Communications and Networks. Together, the two units cover system set-up requirements for computers and computer networks.

This unit is assessed through your portfolio work. The grade on that assessment will be your grade for the unit.

10.2 What You Need to Learn

The topics are:

- hardware
- software
- documentation
- standard ways of working.

This involves understanding the purpose of significant pieces of computer equipment and their links with other components. You will practise choosing and setting up different combinations of components for a range of different purposes and potential users.

**Hardware**

To select and install hardware, you must understand the purpose of each of the components and be able to connect them. How you connect them will depend on the required outcome. Sometimes you will be given the components and asked to assemble them. On other occasions you will be required to choose, from a selection of given components, those that meet the requirements of a particular user's needs.
These activities require a good knowledge and understanding of the hardware components of an ICT system. You will need to be able to specify, using reference materials, any of the following components to create an ICT system to meet specified user requirements:

- main processing unit
- keyboard
- mouse
- VDU
- processor (CPU)
- connectors
- video card
- sound card
- network card
- disk drives
- optical drive
- printer
- scanner
- serial port
- parallel port
- microphone
- speaker
- SCSI controller.

From your experience you will learn how different systems meet different purposes and also the importance of particular components. You will also learn to judge the effectiveness of systems designed for similar purposes, e.g. how different types of RAM are more efficient and how different sound cards and speakers affect the quality of sound coming from a multimedia system.

Technical terms are used extensively in ICT. Following are lists of terms. You do not need to acquire extensive theoretical knowledge about these terms, but you will need to understand how they are used in system specifications and how the items listed affect the selection and installation of a system.

Terms relating to memory such as:

- bit
- byte
- Kb, Mb, Gb, Tb
- RAM
- address
- buffer
- ROM
- volatility
- cache.

Terms relating to the main processing unit such as:

- tower, desk unit
- motherboard
- processor (CPU)
- co-processor
- ISA, PCI, etc
- controller
- card
- bus (address, data)
- clock
- serial port
- parallel port
- expansion slot.

Terms relating to disk drive storage systems such as:

- floppy disk
- hard disk
- optical disk
- write protect
- data compression
- rotation speed
- access time
- capacity
- IDE, SCSI, etc.
Terms relating to optical disks such as:
- CD-ROM
- DVD-ROM/ RAM
- CD-RW.

Terms relating to printers, plotters and VDUs such as:
- resolution
- laser
- scan frequency
- flatbed
- buffer
- interlace
- ink jet
- colour mode (bits)
- refresh rate.

Terms relating to connector plugs and sockets such as:
- centronics
- RJ series
- USB
- BNC
- DB series
- jumpers and settings.
- coaxial
- DIP, DIL switches
- DIP, DIL switches
- USB

You will need to be able to safely install, configure and test complete systems and individual components of a system, including:
- main processing unit
- speaker and microphone
- application software
- keyboard
- scanner
- connecting cables
- mouse
- disk or optical drive
- expansion cards (video, sound or network).
- VDU
- printer

You will need to be able to configure hardware such as:
- printer settings
- DIP, DIL switches
- jumper positions.

Computer systems use consumable materials. You must be able to identify and use suitable consumable materials such as:
- paper
- floppy disks
- toner
- ribbons.

Software

Some software operates the computer system as soon as it is switched on. You must know about the minimum software needed in a computer to enable a user to communicate with it.

You must be able to change (configure) various settings, such as setting the right time and date and more important settings, like setting a password that users must enter for the system to work, calling up a device driver or selecting between alternative operating systems.

Some incorrect configurations are easily corrected. Others could delete all the existing data and make the system unusable. You have to learn to configure systems safely.
There is a range of different types of software. You will need to know what types of software are available and understand the purpose of each type, including:

- ROM-BIOS start-up software
- operating systems
- graphic user interfaces (GUI)
- applications.

The ROM-BIOS is used when the hardware first powers up. Access to these has to be initiated on starting the system. You will need to understand what this start-up software controls and be able to set or define parameters to meet requirements, such as:

- select start-up (boot) disk drive
- define a new disk drive
- set system password
- configure a new card, e.g. video.

Operating systems control the computer and the way it handles all the attached peripheral devices. They also provide the user with a way of communicating with the computer system to configure the way that hardware operates.

There are many different types of operating system (OS). One of the most common provides a graphic user interface (GUI). This OS presents the user with a visually pleasing, simple interface. Other systems only provide a textual (command) interface. To use this type the user has to understand how to enter commands. You will need to be able to select, install and configure operating systems that may have either a command interface or a graphic user interface.

ICT systems can be configured to start up and operate in different ways. The ICT system manager controls many of these. Others can be configured to suit the needs of users. You must learn to set up different system boot or start-up configurations so that a system can be made to start up according to specified requirements. You must also learn how to set up the system to suit user requirements. You will need to be able to use the operating system for settings and diagnostics such as:

- time and date
- password properties
- scheduled tasks
- virus protection configuration
- directory (folder) structure and settings
- checking and setting system properties
- system monitoring
- printer, mouse and keyboard configuration
- multimedia configuration
- GUI desktop and display set-up
- application software icons
- disk diagnostics and tools
- network facilities and configuration
- power management.
There is a wide variety of applications software to meet user needs. You will need to know which type of software suits a particular processing activity. You will have to be able to select, install and configure software most suited to a specified need, including:

- document (word) processing
- desktop publishing
- multimedia reference
- programming languages
- database (record structure)
- spreadsheet (numeric structure)
- vector graphics, e.g. geometric objects
- bit-map graphics, e.g. photo images.

To enable users to make immediate and effective use of the system you will also need to be able to configure the application software in different ways, including preparing or setting items such as:

- preferences (or configuration files)
- macros
- toolbars and the buttons available
- directory structures and defaults
- data templates
- saving and backup security
- menu layout and contents
- borders, rules and scroll bars.

**Documentation**

ICT systems and software occasionally crash. You must learn to record common problems and your attempts, successful or not, at solutions. Records of this nature provide useful reference material for you and others when problems occur repeatedly.

It is also important that you record your experiences in setting up and configuring ICT systems including:

- dates of undertaking work
- specifications used
- components installed
- configuration tasks undertaken
- faults and problems experienced
- solutions applied
- support services accessed
- diagnostic software used.

Records of installation, configuration and associated problems need to be indexed so that information about particular problems or events can be accessed easily.
Standard ways of working

Note: See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You need to learn to:

- edit and save work regularly, using appropriate names for your documents
- store your work where you and others can easily find it
- keep dated backup copies of files on another disk and in another location
- keep a log of ICT problems you met and how you solved them
- avoid bad posture, physical stress, eye strain and hazards from workplace layout.

For this unit in particular, you must be able to work safely and take precautions to avoid hurting yourself or others. In setting up an ICT system you will need to understand and be able to carry out proper safety procedures, including those involving:

- cables, to ensure that they do not obstruct and are electrically safe
- electrical safety, to ensure that power is off when installing components
- ergonomic and physical stress considerations.

You must also be able to implement or recommend proper security procedures, including those that ensure:

- data and software backup is maintained
- confidential information is protected
- passwords are used
- virus checking is undertaken
- copyright is protected
- theft is avoided, e.g. data, software, equipment.
### 10.3 Assessment Evidence for Unit 4: System Installation and Configuration

**You must produce:**
- A specification for a complete ICT system to meet user requirements, together with an operational system
- A specification for an upgrade to an ICT system that requires the installation of at least two items in the processing unit and configuration of software, together with an operational system. You must also show you can remove the installed items and use un-install procedures to restore the system to its original state.
- Records of set-up, installation, configuration and test activities.

Your configuration of software must include setting up a toolbar layout, a menu, a template and a macro. (Hardware installation tasks may be undertaken with a small group of colleagues).

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
</table>
| E1 Define user requirements and produce clear specifications for the ICT system and the upgrade, including for each full details of hardware, OS, applications software and configuration, selecting suitable hardware and software and correctly:  
  - Connect hardware  
  - Install items in the processing unit  
  - Install software  
  - Set ROM-BIOS parameters  
  - Configure OS and software | C1 Adopt a systematic approach to specifying and constructing an operational ICT system through your records of practical work  
C2 Clearly define and implement test procedures to check each task undertaken and show how you overcame problems or limitations found as a result of using the test procedures  
C3 Work independently to produce your work to agreed deadlines. | A1 Demonstrate a good understanding and imaginative use of options for customising applications software, such as keyboard configuration, toolbar layout and menu design, by providing users with facilities that improve efficiency  
A2 Demonstrate an imaginative use of design and attention to detail in the creation of a template and macro that clearly enable users to improve their efficiency and effectiveness  
A3 Make effective use of system diagnostics, system monitoring procedures and de-install routines, implementing adjustments as necessary to ensure correct system operation  
A4 Keep records in an organised way and index them to enable easy reference to the problems experienced and the solutions implemented  
A5 Work independently to produce your work to agreed deadlines. |
| E2 Design and implement a suitable toolbar layout, menu, template and macro to meet the user requirements |                                                                                     |                                                                                   |
| E3 Correctly restore the upgraded ICT system to its original state |                                                                                     |                                                                                   |
| E4 Produce clear records of work done that include suitably annotated printed copy or screen prints of your toolbar, menu, template and macro, together with details of a suitable system configuration check, test procedures, problems experienced and solutions implemented. |                                                                                     |                                                                                   |
10.4 Essential Information for Teachers

Guidance on delivery

This unit requires students to work at, or near, the limits of their knowledge and abilities. In some instances you may need to intervene to prevent students damaging equipment or hurting themselves. In these cases it would not be appropriate to give the student an E grade pass as they have failed to recognise the limits of their capabilities.

The unit is very similar to the intermediate level unit on systems, but the focus of this unit is to acquire a good understanding of the hardware and software that form computer systems and the extensive software configuration tasks that are necessary to meet given specifications.

It is important that you treat the software and hardware items listed as an indication rather than a prescription. It is difficult to keep pace with the advances in ICT and as technology changes some of the items listed may become more or less important and should be reflected in the course delivery.

Students are expected to acquire high-level skills in installing and configuring additional components and software. They will also need to gain experience in using a variety of diagnostic routines. These activities demand time and it is suggested that students work in small groups for setting up a complete system. However, it is important that each student’s evidence clearly shows their individual contribution to the group work and this contribution must meet the requirements of the assessment criteria.

Students will need to make extensive use of screen prints (dumps) to show how they have set or modified software configurations. They need to gain experience of incorporating these, together with their own annotations, into logbooks or reports that describe their activities.

This unit will require observation by the assessor to confirm students’ skills and effectiveness. The creation of a simple checklist, with which the students are familiar, is recommended.

Software

Students should note all new files created when they add new software, try de-installing the software and then check to see if any of the new files remain. Such activity reinforces the value of standard uninstalling software to purge a system of files added by a particular application.

Software problems should include configuring the system by setting new values in the start-up ROM-BIOS often non-volatile RAM (NVRAM), modifying OS system files such as config.sys, autoexec.bat, win.ini, sys.ini or the registry files, and customising the appearance of a GUI system interface. There is a wide range of configuration activities that can be undertaken and students should learn to undertake many of these simple configuration tasks. Sensible installation of software should include setting up suitable folder or directory structures.
Within applications software students should be able to customise the software to meet a user need. Typical requirements are the layout of toolbars and buttons, the operation of multiple key depressions, the operation of macros, the use of standard templates to assist the user to achieve the formats they need, selecting the correct printer or printer driver, or ensuring the default path is suited to user needs.

Operating systems

It is desirable that students have the opportunity to install an operating system. Some systems are more tolerant than others in managing the addition of new pieces of hardware and software. Auto-configuring facilities (plug-and-play) may simplify the addition of new hardware but students should be familiar with facilities for checking what hardware is attached and configured.

At this level students should match the characteristics of the different components to the requirements of the user. They might, for example, select a 21-inch ‘high-resolution’ monitor, a high-speed processor and a colour plotter for a user who will use the system to produce detailed manufacturing drawings.

Consideration of drivers for printers and other hardware might concentrate most on why such drivers are needed and how they may need to be configured rather than how they work.

This unit requires the provision of scarce hardware resources. Using relatively out-of-date systems and with a few spare components, such as plugs and sockets etc, will provide good opportunities for students to gain experience in connecting together and installing equipment and operating systems.

Taking old systems apart and rebuilding them may also help students acquire the necessary practical experience. Building a system from scratch is another possible practical activity, but this may be too time consuming. Undertaking this type of activity gives students the opportunity to question the need for the various components of a motherboard and observe the practical mechanics of fitting system components together in a box (main processing unit).

Depending on the particular facilities available, tutors may properly introduce students to additional technical terms. However, the overriding theme of this unit is practical experience leading to a consideration of general principles.

Guidance on assessment

The result of your assessment of student evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification which in turn is used to generate a qualification grade.

- The mark you award must take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark you determine for a particular student is based on best-fit judgements of the evidence against successive sets of criteria presented as
cumulative grade descriptions for grades E, C and A. When making these judgements you should consider the following general qualities that distinguish between the grades:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.

**Grade E**

To achieve an E grade, students should aim to provide evidence that covers all the requirements stated in the E grade criteria of the assessment grid. It may be however that a student demonstrates considerable effort and skill in some areas at the expense of precise detail in another. Professional judgement should be used to decide what is a reasonable expectation of students and whether the stated quality and sufficiency requirements have, on balance, been met.

Candidates must produce a clear user specification. This will need to list and describe the hardware best suited to meet the user needs. It will also need to identify software that will enable the user to undertake their work. It must also define in some detail the different aspects of software configuration required to meet user needs. They should state whether configuration is undertaken in the operating system software or in application software. The specification must also include details of the purpose and operation of the macro and template. Where necessary, a sketch outline or printed copy of the template or macro should be included.

The major system set-up may be undertaken as a member of a small group. Between them the students must be able to select suitable hardware and software to meet the specification and correctly connect hardware and install and configure software. Configuration could include the design and implementation of toolbar or menu layouts, backup procedures and directory-folder structures to meet the user requirements. When working in a group, each student’s evidence must clearly show their individual contribution to the group and this must meet the assessment criteria.

The system upgrades must be carried out individually. They could install a modem card, a network card, a new parallel port or a sound card. Whatever the task, it will also involve software configuration. These activities will require some observation by the assessor to confirm that candidates are undertaking the work correctly and safely.

They should use annotated screen prints (dumps) and/or photographs (digital or scanned) to provide evidence of their achievements in configuring software, installing items of hardware, creating macros and designing templates.

Candidates’ records of their work should be in a standardised format giving date, task, problems, solutions and comments.

**Grade C**

To achieve a C grade, candidates’ specifications must be of good quality and describe clearly and accurately the system set-up and the macros and templates to be used. They will check their work for accuracy and it will contain few obvious errors.
Candidates should use both operating system and application software effectively and without a great deal of assistance. They should be able to find all the options for configuration and understand how to use them. Observation by the assessor may be needed to confirm candidates’ skill and efficiency.

Candidates are expected to describe the tests that they will use to check whether the system is operational and meets the given specification. Where necessary they will have to devise their own tests to check that work has been completed satisfactorily. An example of where a student would need to devise their own tests is where the upgrade has involved modifications to the menu or toolbars. Where a test is unsatisfactory students must take appropriate action to overcome the problem.

Candidates must work safely at all times.

When they have acquired the necessary knowledge and understanding, candidates should be able to work independently to meet a given deadline. This requirement does not mean without teacher intervention or assistance, rather it means that students do not display undue dependence. The agreed deadline may be re-negotiated between the candidate and teacher to take into account unforeseen circumstances.

**Grade A**

To achieve an A grade candidates must show in-depth understanding of system installation and configuration in their description of the specifications, their practical work and in the records of their work. Their records will be kept in an organised way with an index that enables easy reference to any specific task and to the problems experienced and the solutions implemented.

Their specifications and evaluation will be fairly comprehensive, will contain appropriate and fluent technical language and will be coherent and easy to read.

They will suggest improvements to their work that could improve the user's efficiency.

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### 10.5 Resources

Students must have the facilities to install and to configure hardware and software.

### 10.6 Key Skills Guidance

This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

**Keys to attainment**

These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.
These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Students will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.

10.7 Communication Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Keys Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• acquiring information about installation and configuration, for example by reading instruction manuals</td>
<td>C3.2 Read and synthesise information from two extended documents about a complex subject. One of these documents should include at least one image.</td>
</tr>
<tr>
<td>• producing specifications and records of practical work</td>
<td>C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image.</td>
</tr>
</tbody>
</table>

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• working in a small group to specify, install and configure a new ICT system</td>
<td>C3.1a Contribute to a group discussion about a complex subject</td>
</tr>
<tr>
<td>• demonstrating the setup and configuration of the system</td>
<td>C3.1b Make a presentation about a complex subject, using at least one image to illustrate complex points.</td>
</tr>
</tbody>
</table>
### 10.8 Working with Others Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>performing hardware installation tasks</td>
<td>WO3.1 Plan complex work with others, agreeing objectives, responsibilities and working arrangements</td>
</tr>
<tr>
<td></td>
<td>WO3.2 Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives</td>
</tr>
<tr>
<td></td>
<td>WO3.3 Review work with others and agree ways of improving collaborative work in the future.</td>
</tr>
</tbody>
</table>

### 10.9 Improving own Learning and Performance Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>producing a specification to meet user requirements</td>
<td>LP3.1 Agree targets and plan how these will be met over an extended period of time, using support from appropriate people</td>
</tr>
<tr>
<td></td>
<td>LP3.2 Take responsibility for their learning by using their plan, and seeking feedback and support from relevant sources, to help meet targets</td>
</tr>
<tr>
<td></td>
<td>LP3.3 Review progress on two occasions and establish evidence of achievements, including how they have used learning from other tasks to meet demands.</td>
</tr>
</tbody>
</table>

### 10.10 Problem Solving Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>producing a specification for a complete IT system</td>
<td>PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward</td>
</tr>
<tr>
<td>working on a specification for an upgrade to an IT system.</td>
<td>PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach as necessary</td>
</tr>
<tr>
<td></td>
<td>PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving.</td>
</tr>
</tbody>
</table>
Advanced VCE Unit 5
Systems Analysis

11.1 About this Unit

This unit helps you to:

• Understand the principles of systems analysis
• investigate problems for clients
• apply the principles of systems analysis to propose solutions
• use structured analysis methods to define data and its processing
• create feasibility study reports and system specifications.

You will produce a data model, a feasibility report and a system specification resulting from a structured analysis.

This unit is designed to link closely with Unit 6: Database Design and may act as the basis from which you will develop your database design for Unit 6. Where the units are linked together, the external assessment for Unit 5 must be completed prior to or at the same time as the external assessment for Unit 6.

This unit is assessed through an externally set assignment that may link this unit to Unit 6. The grade on that assessment will be your grade for the unit.

11.2 What You Need to Learn

The topics are:

• systems analysis
• feasibility study
• investigation
• structured analysis tools
• system specification
• creating a conclusion
• standard ways of working.

Systems analysis

You will need to investigate existing information processing systems to decide how they might be computerised or improved. This investigation is called systems analysis. You will need to understand and be able to undertake each of the following stages of systems analysis:

• feasibility study
• investigation (fact finding)
• structured analysis
• system specification.
Feasibility study

A feasibility study is an initial look at an existing information processing system to decide how it might be computerised or improved. You will need to be able to investigate an information processing system and produce a feasibility report that includes:

- a statement of purpose of the system
- a definition of system scope
- a list of deficiencies of the current system
- a statement of user requirements
- the cost and benefits of development
- a conclusion and recommendations.

Investigation

To define the scope of a system you will need to gather information about its environment, its boundary with other systems and the user requirements. Various fact-finding techniques may be used to do this, including:

- interviews
- questionnaires
- observation
- document analysis.

You will need to collect information about the:

- flow of information
- types of data
- sources of data
- decisions taken
- data capture methods
- documents used
- types of processing
- storage methods
- personnel involved
- manual operations
- types of output
- automated operations.

Structure analysis tools

When you have completed your investigation you will need to analyse the information you have collected. You will need to understand and be able to use various modelling and structured analysis tools, including:

- high-level (contextual view) dfds
- process specifications
- entity-relationship diagrams
- low-level (detailed view) dfds
- entity-attribute definitions
- data dictionary.

High-level (contextual view) dfds (data-flow diagrams) outline the general flow of information internal to a system or organisation (generally between departments) and the relationship between the internal system and external entities such as customers and suppliers. For example, the diagram may show the flow of orders from customers to the sales department and then internally to the accounts, stores and despatch departments.

You must be able to produce high-level dfds to provide an overall graphical view of the information flow. The whole system is often shown in one simple diagram.
A high-level dfd can be broken down into further diagrams to show greater levels of detail, known as low-level dfds. To build up a more detailed low level dfd you will need to be able to produce a list of the main events within a system, e.g. produce an invoice or raise a purchase order, and be able to define each of these events in detail using dfds.

You must understand and be able to use correctly all the elements in dfds, including:

- flow indicator, e.g. an arrow and name to describe the movement of a packet of data
- terminator, e.g. an ellipse indicating an external entity such as ‘customer’
- process, e.g. a rectangle indicating a data process such as ‘record order’ or ‘create invoice’
- data store, e.g. a double line or open-ended box indicating a collection of stored data.

For any process element in a dfd you must be able to produce a process specification using a suitable method. You will need to understand and be able to use correctly various methods for defining a process, including:

- structured English
- decision table
- flow chart.

When using structured English to define a process you must be able to use common English verbs with suitable constructs such as:

IF...THEN...ELSE... SELECT CASE...END SELECT
WHILE...DO... REPEAT...UNTIL...

In producing process specifications you will need to understand and be able to use correctly the relational operators =, <, >, <=, >=, < >.

You will also need to understand and be able to use correctly the logic operators AND, OR and NOT.

You must be able to analyse the data collected during your investigation to identify the attributes that form the entities. To define the relationships between entities and their attributes you need to use logical data modelling techniques.

Logical data modelling for systems analysis uses specific terms to describe the data structures. You will need to understand and be able to apply correctly, the data modelling terms:

- entity
- primary key
- relationship
- attribute
- foreign key
- entity-relationship diagram.
An entity is any object of the real world or class of such objects, e.g. a person, a company, a course, a customer or a product.

An attribute is one of the elements that define an entity, e.g. the entity ‘customer’ could have attributes such as name, address and telephone number.

A key is an attribute that has a particular significance. The uniqueness of an instance of a particular entity is normally guaranteed by designating one attribute to be the primary key, e.g. the entity customer could be identified by means of a unique customer number.

An entity has a relationship to another entity when the primary key of one appears as an attribute (called a foreign key) in the other, e.g. an organisation has a list of contacts in other companies. Several of these contacts might work for the same company. Rather than storing the same company details for each of these contacts, a more appropriate way of storing the information is in two tables.

<table>
<thead>
<tr>
<th>Contacts</th>
<th>Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>contact-id</td>
<td>(primary key)</td>
</tr>
<tr>
<td>first name</td>
<td></td>
</tr>
<tr>
<td>last name</td>
<td></td>
</tr>
<tr>
<td>company-id</td>
<td>(foreign key)</td>
</tr>
</tbody>
</table>

Thus the entity ‘contacts’ has a relationship to the entity ‘companies’.

An entity-relationship diagram (erd) is a graphical way of showing the entities and the relationships between them in a system.

You will need to know how to create an erd. You will need to understand and be able to identify different types of relationship, including:

- one-to-one
- many-to-one
- one-to-many
- many-to-many.

You will need to avoid many-to-many relationships because these cause problems when a system is implemented. This can be done by creating an additional entity that has a one-to-many relationship with each of the others, e.g. there are many-to-many relationships between the entities ‘products’ and ‘invoices’. There could be many products on an invoice and any one product could appear on many invoices. A new entity called ‘invoice line’, with the attributes ‘invoice number’ and ‘product code’, would resolve this problem. Only one product appears on any invoice line and any specific invoice line can only appear on one invoice.
You will need to be able to analyse the initial entity-relationship diagram and produce evidence to show that your database schema has been taken to ‘first normal form’ (1NF). This means that there are no repeating groups and that attributes are atomic.

Repeating groups occur when a particular value of an attribute is found in more than one instance of the entity and a change to this value would affect each instance. In the contacts example above, if the company address were held as an attribute of the entity ‘contacts’ this could cause problems, e.g. if a company changed address the record for each contact working for that company would have to be updated. This is resolved by using related tables as shown above.

Atomic means the attributes do not need to be broken down any further. This depends on the uses to be made of the attributes, e.g. you would avoid a single attribute for name, such as ‘John Smith’, if you wished to allow for sorting or searching by last name. The name would need to be split into the two atomic attributes, first name and last name. Likewise, to allow sorting or searching by postcode you would need to make the postcode a separate attribute rather than a part of a single address attribute.

A data dictionary describes all the data components in a system. You must be able to use the results of your investigation, in particular the dfd diagram and the entity-relationship diagram, to produce a data dictionary comprising:

- the entities in the system
- the name and description of each attribute
- the relationships between the entities.

System specification

A system specification is made up of all the information resulting from the investigation and the structured analysis with statements about the input and output needs of the system. You will need to be able to produce a simple system specification to meet user requirements, that comprises:

- a high-level dfd
- low-level dfds
- an entity-relationship diagram
- a data dictionary
- process specifications
- input specifications
- output specifications
- details of resource implications.

You must be able to produce an input specification that defines in detail:

- data sources
- methods of data capture
- validation methods
- data input form or screen layouts
- verification methods used.
You must be able to produce an output specification that defines in detail:

- data required for output
- screen report layouts
- methods of data output
- printed report layouts.

The process specifications provide details of the processes that need to be carried out on the data in the system to generate the results required by the output specification.

Creating a conclusion

In producing a conclusion for your reports you will need to be able to describe the resources needed for the new system. This must include a discussion of:

- software
- hardware
- possible constraints
- personnel.

In your conclusions you will need to be able to specify clearly:

- possible alternatives
- resource requirements
- potential benefits of the change
- possible risks of the change
- cost-benefit analysis
- recommendations.

Standard ways of working

Many organisations have rules and guidelines to help people work effectively and avoid problems. These are known as ‘standard ways of working’. They are very important for people working with information technology.

Note: See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You must learn to:

- plan your work to produce what is required to given deadlines
- save work regularly
- use file names that are sensible and that remind you of the contents
- store files where you can easily find them in the directory/folder structure
- keep a log of any ICT problems you meet and how you solve them
- keep information secure, e.g. protection from theft, loss, viruses, fire
- protect confidentiality, e.g. prevention of illegal access to medical or criminal records
- keep copyright laws, e.g. not using the work of others without permission
- keep dated backup copies of files on another disk and in another location.
### 11.3 Assessment Evidence for Unit 5: Systems Analysis

**You must produce:**
- a feasibility report
- a system specification to meet the requirements (you must also show evidence of data modelling with an entity-relationship diagram (erd) that has at least three related entities).

The assessment materials for this unit will be provided by AQA.

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1  produce a clear statement of purpose and user requirement for the system including a scope definition and a high-level (contextual view) dfd</td>
<td>C1 demonstrate a good understanding and effective use of structured analysis tools in the development of your dfds, the identification of events and the production of process specifications</td>
<td>A1 demonstrate a systematic approach to your analysis of the existing system, investigation of potential improvements and selection of priorities for development</td>
</tr>
<tr>
<td>E2  produce appropriate low-level dfds to describe the main system events</td>
<td>C2 demonstrate a good understanding and method in the development of your erd and data dictionary to resolve problems and ensure first normal form</td>
<td>A2 define clearly in your input specification appropriate sources of data, methods of data capture, layout of screen data input forms and validation and verification techniques</td>
</tr>
<tr>
<td>E3  produce an erd and a data dictionary that clearly lists and describes the entities, their attributes and the relationships</td>
<td>C3 produce a detailed schedule of activities and show evidence that you have kept to your plans, perhaps by using a Gantt chart.</td>
<td>A3 define clearly in your output specification the information to be output in screen or printed reports and appropriate ways of organising and presenting it</td>
</tr>
<tr>
<td>E4  produce accurate input and output specifications and details of resource implications</td>
<td></td>
<td>A4 specify clearly in your conclusion the possible alternatives, constraints, risks and potential benefits, and include a cost-benefit analysis to support your recommendations.</td>
</tr>
<tr>
<td>E5  produce suitable process specifications using an appropriate method</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E6  provide a conclusion that makes recommendations for development.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
11.4 Essential Information for Teachers

Guidance on delivery

Ideally, students will complete their external assessment for Unit 5 before that of Unit 6, to allow them to take their systems analysis into database design.

This unit links with Unit 6: Database Design, but to ensure that each unit is meaningful in its own right there is a small overlap in content. The overlap is appropriate because the approach in each case is different. In systems analysis, data modelling tools are used to investigate existing or potentially new systems while in database design they are concerned with aspects of logical design, reliability and integrity.

The activities of this unit should precede immediately those in the Unit 6: Database Design. This will make it possible to reduce the resources needed and to identify more appropriate resources for the task. As the unit is combined with Unit 6: Database Design the type of resources required are:

- examples of dfds and process definitions
- examples of structured data modelling
- simulated systems with copies of input-output documents, organisation charts, etc
- access to manual data processing systems suited to investigation for computerisation
- access to computerised database systems that are not meeting their customers needs.

It is likely that a good deal of teaching will be required before students acquire the necessary skills in using the tools of systems analysis. Each of these tools requires knowledge and experience before they can be used on a realistic task. This teaching should be based on the use of a variety of case studies so that students will have the opportunity to work on a range of problems to improve their skills in producing:

- high-level dfds
- low-level dfds
- process specifications using structured English, decisions and flow charts
- entity-attribute definitions
- entity-relationship diagrams
- a normalisation data model to first normal form (atomic and no repeating elements)
- a data dictionary.

The analysis involved in this unit represents a simplified version of the formal techniques of SAD. It would be unwise to confuse students by presenting them with the full complexities of a professional method such as SSADM.
This unit is externally assessed. Exemplar assessment material may be obtained from AQA. Teachers are strongly advised to use these materials to assist them in preparing candidates for the external assessment.

The result of the external assessment of candidate evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification, which in turn is used to generate a qualification grade.

The mark awarded will take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark determined for a particular student is based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements the following general qualities that distinguish between the grades will be considered:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.

**Grade E**

To achieve an E grade, students should aim to provide evidence that covers all the requirements stated in the E grade criteria of the assessment grid. It may be however that a student demonstrates considerable effort and skill in some areas at the expense of precise detail in another. Professional judgement will be used to decide what is a reasonable expectation of students and whether the stated quality and sufficiency requirements have, on balance, been met.

Candidates should analyse systems likely to result in the construction of a complex database. They must begin their work with a clear statement of purpose of the system. This needs to include a description of what is covered by the specification and what is not covered (a scope definition) and a good outline sketch and description of the existing or the proposed system.

Candidates must produce clear:

- processes definitions using structured English
- lists of all the system events
- entity-relationship diagram and show it to be in first normal form
- data dictionary definitions that clearly lists and describes the entities and their attributes
- input specification, output specification and hardware-software specifications.
These items must be clearly written and cover the complete system under investigation. Candidates must show that they have carefully checked the accuracy of their report and kept backup copies of all files.

**Grade C**

Candidates’ data dictionary must define, in detail, all entities, attributes, keys, entity relationships, flows and data stores. It must also list and clearly describe all events and define all processes using structured English, decision tables or flowcharts.

Candidates must also specify the possible alternatives, constraints and potential cost and benefits of the system.

They should carefully plan their work and work independently to meet a given deadline, once they have acquired the necessary knowledge and understanding. This requirement does not mean without teacher intervention or assistance, rather it means that students do not display undue dependence. The agreed deadline may be re-negotiated between the candidate and teacher to take into account unforeseen circumstances.

**Grade A**

To achieve an A grade candidates must show an in-depth understanding of systems analysis in their investigation, the use of structured analysis tools and system specifications.

Their report and specification will be quite comprehensive and will show appropriate and fluent use of technical language. The work will be coherent and easy to read. Candidates will also identify good and less-good features of the systems, making suggestions for possible improvements.

Candidates must clearly define in their input specification the sources of data, the methods of data capture, the layout of data input forms and the validation and verification techniques used. Similarly, they will define in their output specification the information to be output and the precise layout of screen and printed reports.

### 11.5 Resources

Students must have access to relational database management software.

### 11.6 Key Skills Guidance

This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be sections should be used in conjunction with each other.

#### Keys to attainment

These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.
Signposts

These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Candidates will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.

11.7 Communication Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing a feasibility report and system specification</td>
<td>C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image.</td>
</tr>
</tbody>
</table>

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• researching dfds, erds and data dictionaries</td>
<td>C3.2 Select and synthesise information from two extended documents about a complex subject. One of these documents should include at least one image.</td>
</tr>
</tbody>
</table>

11.8 Improving Own Learning and Performance Level 3

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
</table>
| • producing a system specification | LP3.1 Agree targets and plan how these will be met over an extended period of time, using support from appropriate people.  
LP3.2 Take responsibility for their learning by using their plan, and seeking feedback and support from relevant sources, to help meet targets.  
LP3.3 Review progress on two occasions and establish evidence of achievements, including how they have used learning from other tasks to meet new demands. |
### 11.9 Problem Solving Level 3

#### Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing a system specification to meet the requirements</td>
<td>PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach as necessary.</td>
</tr>
</tbody>
</table>

#### Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
</table>
| • producing a feasibility report | PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward  
PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving. |
12

Advanced VCE Unit 6

Database Design

12.1 About this Unit

This unit helps you to:

- explore how record-structured databases are used in organisations
- explore how information is structured for database storage and processing
- understand and use logical data modelling
- learn and apply the principles of relational database design
- design, implement and test a relational database to meet a given specification
- produce user documentation
- develop good practice in your use of ICT.

You will produce a relational database and design notes and technical documentation and user instructions.

This unit links very closely with Unit 5: Systems Analysis.

This unit is assessed through an externally set assignment that may link this unit to Unit 5. Where the units are linked, the external assessment for Unit 6 must be completed after or at the same time as the external assessment for Unit 5.

The grade for the external assessment will be your grade for the unit.

12.2 What You Need to Learn

The topics are:

- database concepts
- logical data modelling
- normalisation
- relational database structures
- relational database construction
- documentation
- standard ways of working.

Database concepts

Data is usually a small piece of information such as a fact or figure. Data has to fit into a structure such as a sentence to give it meaning. The sentence ‘Mr Peate owes us £100’ is an example. The words ‘Mr Peate’ and the figure ‘£100’ are items of data. These words have little meaning in isolation, but when put together in a sentence, they provide meaningful information. You must be able to identify data in different forms of structure.
In this unit you will learn about the use and application of record-structured relational databases. You will need to investigate various manual and computerised systems: how they work and the types of information (data) that they process. The investigation could include databases in areas such as:

- health, e.g. doctors, patients, appointments
- employment, e.g. name, pay, department
- agencies, e.g. clients, services, reservations
- sale of goods, e.g. orders, goods, invoices
- libraries, e.g. books, loans, members
- police, e.g. offenders, crime, officers.

These databases will have two or more tables. You need to understand that a single table can have relationships with other tables. An example of this would be a hospital appointments table, which will have a relationship to the other tables because each appointment involves a patient and a doctor.

Many types of data are used when presenting information in databases. You must learn about and be able to use the following data types:

- text (string)
- number
- currency
- date
- time
- logical, e.g. true or false.

Many data types have various formats. You need to understand and be able to use the different formats correctly, including:

- text (string), e.g. limited length, unlimited length, memo
- number, e.g. integer, auto record number, long
- date, e.g. dd/mm/yy, dd month, 24-hr clock
- currency, e.g. pound (£), dollar ($)
- logic, e.g. true and false, Y and N.

To avoid incorrect data entry you need to be able to validate data, including checking:

- data type
- the text or case
- format
- number range
- date range
- length of data.

Logical data modelling makes use of specific terms to describe the data structures as a first step towards designing a database. You will need to understand and be able to apply correctly, the data modelling terms:

- entity
- relationship
- foreign key
- attribute
- primary key
- composite key.

An entity is any object of the real world, for example a person, a company, a course, a customer or a country.
An **attribute** is one of the elements that define an entity, for example the entity ‘customer’ could have attributes such as name, address and telephone number. When attributes need not be broken down any further they are said to be atomic. Thus you would avoid placing the attribute ‘John Smith’ in one field. To make this attribute atomic you would use two fields, with ‘John’ in one field and ‘Smith’ in the other. This would, for example, allow searching by last name or sorting by last name then first name.

A **key** is a database field that has a particular significance. Relational database software makes use of different types of key. A relational database dictates that each row (record) of the table be unique. You guarantee uniqueness by designating one column (field) to be the **primary key**. This column must contain unique values for every row. All columns that contain unique values for every row are called **candidate keys**. The primary key must be selected from the candidate keys. All remaining candidate keys are called **alternate keys**.

Keys may be simple or composite. A **composite key** is one that is made up of two or more columns (fields). A primary key may be a composite key. You will need to be able to identify and use composite keys to sort data in a table, e.g. using last name and first name to sort a list of people. There may even be a need to have a third field such as ‘date of birth’ in the key to ensure that it is unique.

When the primary key in one table is related to a field in a second table, the field in the second table is known as a **foreign key**. You will need to be able to identify a suitable foreign key when relating two tables.

From an outline specification you must be able to explore the system to create an initial logical data model. In such a model you must:

- identify all the entities
- define the entities in terms of attributes
- ensure that attributes are atomic (cannot be broken down into further attributes)
- define relationships between entities
- define the model diagrammatically using an initial entity-relationship diagram (erd).

You will need to be able to analyse the initial data model to resolve:

- many-to-many relationships
- which data attributes or combinations of attributes provide the keys.
Normalisation

A database must have integrity. This means that it must be consistent, accurate and reliable. You need to learn that to ensure integrity in a database:

• there must be no repeating groups of data in a table
• all attributes in a table must be atomic
• all primary keys must remain unique
• every foreign key must have a matching primary key in its related table.

Normalisation is a process that reduces errors due to badly designed data structures, e.g. entities, attributes, and relationships. Normalisation can be carried out at various levels of complexity. You will need to understand the purpose of, and the methods used, to normalise an initial data model to:

• first normal form (no repeating groups of attributes and atomic data items)
• second normal form (all attributes depend only on the primary key)
• third normal form (all attributes are mutually independent of one another)

You will need to be able to analyse and change a database structure or logical model, as necessary, to make it meet the first three forms of normalisation. Following normalisation you must be able to build a definitive logical data model comprising an entity-relationship diagram (erd) and a data dictionary (dd).

Relational database structures

Relational database software provides various design facilities. You must understand and be able to use these to create suitable database structures. There is a wide variety of software available and many use different terminology to describe database design. You will need to understand and be able to use terms that have the same or very similar meaning, including:

• table, relation, entity (note that a relation is different from a relationship)
• record, row, tuple, unique entity instance
• field, column, entity attribute.

In creating a database structure you will need to be able to:

• identify the tables (entities) to form the structure
• identify the fields (attributes) for each table
• normalise the tables (a re-iterative process)
• define suitable field names
• define the data type for each field
• define the size (length) of each data field
• identify which field(s) are primary keys
• identify which field(s) are foreign keys (the relationships between tables).
Relational database construction

Relational database software allows you to build a database to meet the needs of the normalised data model. You need to understand how to:

- construct tables defining the entities
- define the fields in each table
- define primary and foreign keys
- define relationships between tables
- include calculations in reports
- use wizards effectively

Data entry in most databases requires the user to enter the data into screen-based forms using the keyboard. You must understand and be able to use the software to create screen data entry forms that:

- enable the entry of data into a single table
- enable the entry of data into multiple tables
- have appropriate entry form field lengths
- provide clear labelling of entry form fields
- provide instruction fields where necessary
- include validation checks on field entries as appropriate
- enable the selection and entry of data from built-in lists (constructed from other tables)
- comply with the data dictionary
- include calculation (formula) fields
- make use of automated number fields (counter fields)
- use date and time fields.

Various types of reports are used for computer databases. Examples of printed reports are invoices, statements, price lists and stock lists. Examples of screen reports are those used by travel agents and rail information staff. You must understand and be able to create database report forms that:

- produce printed reports
- produce screen reports
- have suitable headers and footers
- have sorted data grouping
- include calculations and total fields
- meet specified interrogation needs
- include specified queries, such as SQL (structured query language) and QBE (query by example).
Testing

You must learn to test your database solutions. Does your solution meet the specification agreed with the user? Does your database accept all the data for which it was designed, including normal, extreme and abnormal data? Do users find your database easy to operate? Is the database robust or can it be made to crash?

You will need to be able to create a test specification that defines tests for:

- acceptable data input values (including maximum and minimum values)
- unacceptable data values that should be automatically rejected
- inputs, such as mouse or key depressions, that require a specific response
- inputs, such as mouse or key depressions, to which the system should not respond.
- checking every facility provided in the database, e.g. data entry, queries, reports
- checking, independently, that all functions and/or formulae work correctly
- checking that the system meets user requirements.

Documentation

You must learn to document the development of your database and create instructions for users. Technical documentation is for specialists. It records the design and development of the database. You must learn to record your work. Your records may include:

- a copy of the specification agreed with the user
- details of the hardware, software and other resources required
- a detailed entity-relationship diagram
- a detailed data dictionary
- details of any program code
- details of validation and verification procedures
- details of all input and output screens and printed reports
- copies of the test specification.

User documentation helps others to use your database. You must learn to write user instructions that are simple to understand. Your instructions could include:

- how to start the database
- how to append, delete and edit records
- examples of screens and data entry forms
- instructions about using queries and producing reports
- advice about how to respond to error messages
- examples of data output screens and printed copy.
Standard ways of working

Note: See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You must learn to:

- edit and save work regularly, using appropriate names for your files
- keep dated backup copies of files on another disk and in another location
- keep a log of ICT problems you met and how you solved them
- protect confidentiality and observe copyright laws
- avoid bad posture, physical stress, eye strain and hazards from workplace layout.
### 12.3 Assessment Evidence for Unit 6: Database Design

**You must produce:**
- a relational database to a given specification requiring at least three related tables
- design and analysis notes for the database
- annotated printed copy and test results for the database
- a user guide and technical documentation.

The assessment materials for this unit will be provided by AQA.

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1 create a user-friendly menu driven front end</td>
<td>C1 design and create reports that make correct and effective use of queries, grouping, arithmetic formulae and related tables</td>
<td>A1 provide detailed design and analysis notes that include graphic images to define the data model clearly and demonstrate that it is correctly normalised to third normal form</td>
</tr>
<tr>
<td>E2 clearly show the entities, attributes, keys, relationships, and internally generated or processed data in your design notes</td>
<td>C2 use technical language fluently, make good use of graphic images and use annotated screen prints to create effective user instructions and technical documentation</td>
<td>A2 make effective use of validation and of automatic counter, date or time fields in data input forms</td>
</tr>
<tr>
<td>E3 produce a working relational database that allows users to append, delete and edit data, initiate queries and print reports</td>
<td>C3 produce a detailed schedule of activities and show evidence that you have kept to your plans, perhaps using a Gantt chart.</td>
<td>A3 design and implement test procedures that check reliable operation including rejection of data outside the acceptable range</td>
</tr>
<tr>
<td>E4 produce suitable and correct data input forms</td>
<td></td>
<td>A4 produce user-friendly, well laid out screen data input forms with title labels, field names, set widths, pull-down lists and instructions as appropriate to enable data entry into multiple tables.</td>
</tr>
<tr>
<td>E5 produce a user guide that enables novice users to make efficient use of the database</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E6 define clearly and accurately in the technical documentation:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• the database structure and data relationships</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• a data dictionary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• the range of acceptable data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• example output from queries and reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• test procedures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E7 produce printed reports and screen prints that clearly demonstrate the operation of the database, annotated to explain their purpose.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12.4 Essential Information for Teachers

Guidance on delivery

This unit should be integrated with Unit 5: *Systems Analysis* to produce a study covering data analysis and design methods. Ideally, students will produce their database design from the systems analysis carried out for Unit 5.

This unit includes the concepts of normalisation to third normal form. It is essential to introduce students to normalisation at this level if they are to create a database that has three or more related tables.

You will need to provide students with a variety of databases that contain three or more related tables and demonstrate why the normalisation procedures are so important in producing a stable and reliable database. The tables provided could be incorrect and require normalisation so that students acquire experience of normalising.

Before starting the assessment for the unit, students need to handle information in a wide variety of ways. It is very likely that the requirement in the ‘database concepts’ section will be met by the examples provided by you. Students will need to exercise their database skills extensively before they are ready to design, analyse and produce their own database application.

It is also important that students acquire some experience of live database systems. This experience is essential if they are to design and construct information databases to meet specified user requirements.

It is suggested that students could spend some time working together, both in pairs and as small groups to:

- identify appropriate database applications
- collect information about the processing problem
- discuss what has to be done
- analyse the data requirements
- produce outline proposals for a database.

Having worked as a team to identify, analyse and design databases it is essential that they work individually to design and construct their own database. This must be based upon independent work previously produced for the externally assessed unit.

You should note that the assessment for Unit 6 must be completed after that for Unit 5. Students may submit their work for Unit 6 at the same time as that for Unit 5 if they wish. Further guidance will be provided by AQA regarding the administrative procedures for the submission of work for the externally assessed units.

You will need to ensure that the products used for assessment are the individual work of the student and not simply copies of other students’ work.
This unit is externally assessed. Sample assessment material for the unit may be obtained from AQA. Candidates should be encouraged to use these materials to assist them in preparing for the external assessment.

The result of the external assessment of candidate evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification which in turn is used to generate a qualification grade. The guidance below relates in particular to external assessment and is provided for your information. You are not expected to internally assess candidates’ work for this unit.

The mark awarded will take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark determined for a particular student is based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements the assessor will consider the following general qualities that distinguish between the grades:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.

**Grade E**

To achieve an E grade, students should aim to provide evidence that covers all the requirements stated in the E grade criteria of the assessment grid. It may be however that a student demonstrates considerable effort and skill in some areas at the expense of precise detail in another. Professional judgement will be used to decide what is a reasonable expectation of candidates and whether the stated quality and sufficiency requirements have, on balance, been met.

In their analysis, candidates must be able to present the initial draft design and final data model. This must be correctly normalised to first normal form, with all repeating elements or non-atomic attributes removed. They must also show clearly all entities, attributes, keys, relationships, and internally generated or processed data.

At this level, candidates must be able to produce a working relational database that allows users to append, delete and edit data, initiate queries and print reports. This will necessitate the production of clearly labelled data entry forms and a user guide that enables novice users to make efficient use of the database.

In their technical documentation, students must clearly present:

- the database structure and data relationships
- a data dictionary
- the limits on acceptable data for entry
- example output from queries and reports.
Grade C  Candidates will make correct and effective use of grouping or arithmetic formulae in queries and reports that require the use of related tables. They will use technical language fluently, make good use of graphic images and use annotated screen prints to create effective user instructions and technical documentation.

Grade A  Candidates must produce design and analysis notes and graphic images that clearly define the data model that has been correctly normalised to third normal form.

Their design notes, their database and the analysis will indicate an in-depth understanding of database at this level. It will also contain appropriate and fluent technical language and should be coherent and easy to read.

They must make good use of counter, date and time fields, pull-down lists and validation in data entry forms. They will design and implement test procedures to ensure reliable operation, including the handling of unacceptable data.

They should produce user-friendly, well laid out data input forms with title labels, field names, set widths and instructions for data entry.

12.5  Resources

Students must have access to relational database management software.

12.6  Key Skills Guidance

This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

Keys to attainment

These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.

Signposts

These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Candidates will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.
12.7 Communication Level 3

Keys to attainment

If students are: producing technical and user documentation, annotated printed copy and design and analysis notes

There may be opportunities for them to develop the following Key Skills guidance:

C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image.

12.8 Working with Others Level 3

Signposts

If students are: working on the production of the database and the user guide and documentation

There may be opportunities for them to develop the following Key Skills evidence:

WO3.1 Plan complex work with others, agreeing objectives, responsibilities and working arrangements.

WO3.2 Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives.

WO3.3 Review work with others and agree ways of improving collaborative work in the future.

12.9 Improving Own Learning and Performance Level 3

Signposts

If students are: producing the relational database and user guide documentation.

There may be opportunities for them to develop the following Key Skills evidence:

LP3.1 Agree targets and plan how these will be met over an extended period of time, using support from appropriate people.

LP3.2 Take responsibility for their learning by using their plan, and seeking feedback and support from relevant sources, to help meet targets.

LP3.3 Review progress on two occasions and establish evidence of achievements, including how they have used learning from other tasks to meet new demands.
### 12.10 Problem Solving Level 3

#### Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing a relational database and related documentation</td>
<td>PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach as necessary.</td>
</tr>
</tbody>
</table>

#### Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
</table>
| • producing a relational database requiring at least three related tables | PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward.  
PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving. |
13.1 About this Unit

This unit helps you to:

- acquire an understanding of communications and networks
- use computer networks to manage files
- use a WAN to communicate information
- search for, select and download information and software from the Internet
- identify the components for constructing a computer network
- specify the layout of a computer network
- set up and configure a computer network
- develop safe working practice.

You will use local and wide area computer networks to exchange e-mail and attached files and will locate and extract specified information and software from the World Wide Web. With colleagues, you will also specify, design and construct a peer-to-peer or client-server computer network.

This unit links closely with Unit 4: System Installation and Configuration. The information searching techniques you learn in this unit will help with investigation work you may need to carry out for other units of this course.

This unit is assessed through your portfolio work. The grade on that assessment will be your grade for the unit.

13.2 What You Need to Learn

The topics are:

- computer networks
- using computer networks
- network design
- network hardware and software
- constructing computer networks
- documentation
- standard ways of working.

Computer networks

A computer network is a number of computers that are linked together for some data processing purpose. Examples of computer networks are:

- the point of sale terminals in a computerised store
- an office with three computers connected together to share data
- a large company with many interconnected computers sharing resources and security systems.
A computer network offers various benefits over the use of stand-alone computers. You will need to understand the advantages of computer networks, including:

- sharing hardware resources
- sharing software resources
- sharing common data
- potential intranet provision
- e-mail communication between users
- centralised backup services.

There are some disadvantages to networking computers. You must learn about problems such as:

- potential loss of security
- loss of speed
- cost of purchase and set-up
- maintenance and supervision costs.

There are two different types of computer network – peer-to-peer and client server-based. (In these terms the words ‘client’ and ‘peer’ apply to the computers.) You need to learn that:

- clients (computers) use but do not provide network services
- peers (computers) both use and provide network services (they are both client and mini-server)
- servers only provide network services.

You need to learn the differences between peer, client and server computers. Peer-to-peer networks are usually very small and often connect only three or four computers together. Extensive use of shared resources on peer-to-peer networks may result in a reduction in performance. They are also less secure than server-based networks. Each peer computer requires:

- a simple network operating system, e.g. network client software
- a network interface card (NIC) to enable it to connect to the network (via cable or radio)
- software, in the form of protocols, to enable it to communicate with the network.

Client server-based networks provide access to many files, hardware resources and users while maintaining performance and security. These facilities demand more administrative and technical support. In client server-based networks:

- the server is a dedicated machine, it is not used as a client
- the server runs a full network operating system (NOS)
- server and client require network interface cards (NIC) to connect to the network
- server and client require software protocols for communication with the network.
The difference between peer-to-peer and server-based computer networks is important because each has different capabilities. You will need to understand the factors that affect the choice of network, including:

- size of the network
- level of security required
- needs of the users
- level of administrative support available
- amount of network traffic
- cost.

A local area network (LAN) is a computer network that covers a local geographical area such as one building or one site. A wide area network (WAN) is a computer network that operates over wide geographical areas such as town-to-town or country-to-country.

A WAN provides various additional services. You will need to be able to explain the purpose of such services and how they work, including:

- long-distance e-mail (via the Internet)
- long-distance conferencing
- access to the World Wide Web (www)
- access to public domain software
- data file exchange (file attachment)
- commercial transactions (e-commerce)
- access to bulletin boards and forums
- web-based marketing or advertising.

**Using Computer Networks**

You must be able to use a LAN to:

- access your allocated workspace with a password
- copy, move, rename, delete and back-up files
- create and modify the directory-folder structure
- set directory access rights to other users, e.g. read, write, copy, delete
- set file access rights to other users, e.g. read, write, copy, delete
- read from and copy files from another user’s allocated workspace where access is granted
- write to and copy files to another user’s allocated workspace where access is granted
- access and use application software on a server
- send and receive e-mail.

The Internet offers access to a wide range of information and communication services. You will need to understand the meaning of technical terms used to describe the Internet and its services, including:
You must be able to use the Internet to identify suitable information sources for a number of varied topics. You also need to learn how access the Internet to:

- locate and access search engines
- apply suitable search techniques and search criteria
- access a given website
- save and store frequently-used website addresses
- locate and download information
- locate and download public domain software
- You must be able to use a LAN and the Internet to:
- send, receive and reply to e-mail messages
- send and receive attachments
- maintain an e-mail address book
- handle distribution lists
- file e-mail appropriately
- virus-check e-mail and attachments as necessary.

You need to understand the problems of sending or receiving large data files and the effect on transmission time and costs. Large data files can often be compressed. You need to understand data compression and know how to compress a data file.

Computer-based communications systems are often used only for brief periods of time. It is common practice to maintain a log of communications activities for these systems. You must know how to create such a log and use it to record communication activities undertaken, including:

- date
- duration of communication
- time
- source or destination.

**Network design**

You need to learn how to design a simple computer network. To design a network, you must:

- select a suitable network architecture
- select a suitable topology
- specify the cables and connectors or wireless system
• specify the network client software
• specify the required communication protocols
• specify the network services.

You must learn how to specify these resources and how to use graphic images to indicate clearly the layout and construction of the computer network. There are many technical terms used to describe the operation and construction of computer networks. You will need to understand the technical terms outlined below and how they affect specifications and configuration.

Terms relating to signals and types of signal, such as:

• analogue
• frequency
• digital
• modulation (and demodulation).

Terms relating to topology, such as:

• star
• ring
• bus
• (wireless).

Terms describing common network architectures, such as:

• Ethernet (star or bus)
• Token Ring (ring)
• (wireless).

Terms relating to transmission medium or method, such as:

• two wires, e.g. twisted pair
• microwave, e.g. satellite, dish to dish
• infrared
• transmission frequency or rate
• coaxial cable (thick and thin)
• optical fibre
• radio
• bandwidth.

Terms relating to connectors and cables such as:

• RS232, RS449 and V series, e.g. V.24, V.35
• RJ-11 and RJ-45 – used for telephone and twisted pair connections
• DB9 and DB25 plugs and sockets – used for computer and modem connections
• USB connectors – multi-purpose connectors
• BNC coaxial connectors.
When two or more computers are connected together they need an agreed way of communicating with one another. The most common protocols that enable communication between them are:

- NetBIOS – network basic input/output system
- TCP/IP – transmission control protocol/Internet protocol
- IPX/SPX – Internet packet exchange/sequenced packet exchange
- NetBEUI – NetBIOS extended user interface.

LAN and WAN communication systems use particular types of hardware. You will need to understand the purpose of:

- computers as file servers
- computers as print servers
- NICs – network interface cards
- active and passive hubs or MAU
- transmission medium and connectors
- modems
- bridges
- a gateway.

These communication systems also use various types of software. Some operating systems have network client software available within the operating system. Others require the installation of network operating software (NOS).

You will need to understand the purposes of the different types of software and the functions it performs including:

- OS – operating system, often includes provision for network client software
- NOS – a dedicated network operating system
- network adapter software to configure the network interface card
- network client software to act as, or interact with, a network operating system
- protocol software for network communications
- network service software, such as file or printer sharing facilities
- remote access software to provide automated facility to dial up an ISP
- Internet browser software – facility to browse the Internet.
Constructing computer networks

You must be able to set up and configure a simple network including items such as:

- installing network interface cards
- installing a network hub
- connecting systems together
- installing and configuring software
- setting up network services
- setting up users and passwords
- creating directories or folders
- setting access rights.

To set up a network you must be able to install network interface cards into the computers that are to form the network. You will then need to install and configure network adapter software to set the correct interrupt (IRQ) settings for the network cards.

When configuration of the network cards is complete you must select and install the interconnecting cables between the computers. There are various types of connector. You will need to select connectors to suit your network cards. Common connectors are:

- thick Ethernet – BNC coaxial connection
- thin Ethernet – BNC coaxial connection
- twisted pair Ethernet – RJ-45 connector
- token ring – STP, UTP or fibre optic.

When the computers, hub and cables form a hardware network you must learn how to install the network client software, the necessary protocol software and suitable network services.

When network facilities are available you need to be able to set up new users, allocate passwords, create directory or folder structures and set access rights to users.

Documentation

ICT systems and software occasionally crash. You must learn to record common problems and your attempts, successful or not, at solutions. Records of this nature provide useful reference material for you and others when problems repeatedly occur.

It is also important that you record your experiences in setting up and configuring ICT networks including:

- dates of undertaking work
- specifications used
- components installed
- configuration tasks undertaken
- faults and problems experienced
- solutions applied
- support services accessed
- diagnostic software used.

Records of installation, configuration and associated problems need to be indexed so that information about particular problems or events can be accessed easily.
Standard ways of working

Note: See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You need to learn to:

• edit and save work regularly, using appropriate names for your documents
• store your work where you and others can easily find it
• keep dated backup copies of files on another disk and in another location
• keep a log of ICT problems you met and how you solved them
• avoid bad posture, physical stress, eye strain and hazards from workplace layout.

For this unit in particular, you must be able to work safely and take precautions to avoid hurting yourself or others. In setting up a network you will need to understand and be able to carry out proper safety procedures, including those involving:

• cables (to ensure that they do not obstruct and are electrically safe)
• electrical safety (to ensure that power is off when installing components)
• ergonomic and physical stress considerations.

You must also be able to implement or recommend proper security procedures, including those that ensure:

• data and software backup is maintained
• confidential information is protected
• passwords are used
• virus checking is undertaken
• copyright is protected
• theft is avoided, e.g. data, software, equipment.
You must produce:

- an investigative report about an ICT-related topic that includes:
  - a portfolio of information and software retrieved from the Internet about the topic
  - a portfolio of e-mail and file attachments resulting from the use of local and wide area networks
  - a record or log of electronic communication activities
- a specification for a computer network
- a working computer network resulting from a group activity, together with an individual report of the activity.

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1  clearly specify the purpose of the investigation and the information and software required, indicating possible sources, search engines and search criteria to be used</td>
<td>C1 demonstrate that as a result of thorough investigation you have found and used a variety of search engines, located several relevant sources of information and located suitable download software</td>
<td>A1 clearly annotate printed copy and screen prints to show that you can correctly and appropriately use e-mail distribution lists and associated reply techniques, check that delivery is confirmed, check that e-mail has been read and effectively use e-mail filing systems and address books</td>
</tr>
<tr>
<td>E2  annotate your retrieved information to indicate its sources, how the sources were identified, the search criteria used and how it meets the specification</td>
<td>C2 demonstrate a good understanding of the use of local and wide area computer networks and their design, construction and installation</td>
<td>A2 show that you have kept an accurate and comprehensive record or log of your use of e-mail and the Internet detailing the date, time and duration of each session</td>
</tr>
<tr>
<td>E3  clearly annotate copies of e-mail and files received and transmitted to identify sender, recipient, time, date and the purpose of attachments</td>
<td>C3 demonstrate that you can work independently to produce your work to agreed deadlines.</td>
<td>A3 produce detailed specifications of the cables, connectors, hub or MAU if used, network interface cards (NIC) and computers making up the network</td>
</tr>
<tr>
<td>E4  clearly specify the hardware and software for the computer network using graphics to show the layout of the network and its connections</td>
<td></td>
<td>A4 produce detailed software specifications for the adapter (NIC), network client, protocol and network services required.</td>
</tr>
<tr>
<td>E5  clearly demonstrate, in your own individual report, that your group was able to complete the network wiring correctly and without damage, install and configure the network software, set up network users and enable users to access their own allocated area and other resources</td>
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</tbody>
</table>
13.4 Essential Information for Teachers

Guidance on delivery

The aim of this unit is to provide students with the skills and confidence to set up and administer their own simple computer network system. Students achieving higher grades will have a critical awareness of the alternatives that are available, and the potential impact of likely future developments.

The unit links closely with Unit 4: System Installation and Configuration and it is strongly recommended that the two units are delivered together. The units are similar in terms of practical activities but this unit is more theoretical. Students need to acquire a good understanding of computer network and communications theory before attempting to select and install hardware and software.

Students must have access to hardware and software that reflects current developments in communications and computer network technology. They will also need Internet access. Network systems may be set up using any appropriate network software including Windows. The installation of network cards could be an integral part of this unit and of Unit 4.

Where Windows or similar is used it is suggested that a simple network starter kit is purchased (available for around £75 for a three-card kit). This provides the necessary hardware and software. The only actions required after installing and configuring the NICs is the configuration of network client, protocols and network services. These are all available in the Windows OS via the control panel and network facility.

It is important that you treat the network items listed in the unit as an indication rather than a prescription. Technology in this area changes very rapidly and as some of the items listed may become more or less important the course should reflect this. For example the use of non-wire communicating methods eases the need for providing interconnections.

These activities demand time and it is suggested that students work in small groups for some activities. However, it is important that each student’s evidence clearly shows how the individual contribution to the group work meets the requirements of the assessment criteria.

It is suggested that students first learn how to connect two stand-alone computers for direct communications. This may be undertaken using a null modem and appropriate communications software such as LapLink. Activities of this kind will provide them with a good understanding of the way in which systems communicate and the protocols involved.

There is a lot of theoretical work for this subject. The theory in this case is an essential element for the practical work of creating communications and network systems.
The extent to which students are required to disassemble equipment is limited in this unit. The requirement for installing a network card could be integrated with the installation of hardware into the main processing unit defined in Unit 4.

The main part of practical skill in this unit is the assembly of network cables or wireless systems and interconnection between the computers.

Guidance on assessment

The result of your assessment of candidate evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification which in turn is used to generate a qualification grade.

The mark you award must take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark you determine for a particular student is based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements you should consider the following general qualities that distinguish between the grades:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.

Grade E

To achieve an E grade, candidates should aim to provide evidence that covers all the requirements stated in the E grade criteria of the assessment grid. It may be however that a candidate demonstrates considerable effort and skill in some areas at the expense of precise detail in another. Professional judgement should be used to decide what is a reasonable expectation of candidates and whether the stated quality and sufficiency requirements have, on balance, been met.

Candidates must specify the purpose of their ICT-related investigation and the information and software required before they attempt to retrieve the information from the Internet. They must indicate clearly the possible sources of the information, the search engines and the search criteria they intend to use.

They must annotate the retrieved information to indicate its source, how the source was identified, the search criteria used and how it meets their written specification.

Candidates will need to produce copies of their e-mail and some indication of the files they received or sent. These copies must be clearly annotated to indicate the sender, recipient, time, date and purpose of any attachments.
The candidates will need to produce a specification for the computer network that they intend to set up. This must clearly specify the hardware and software for the computer network and show, making good use of graphic images, the layout of the network and its connections.

Candidates must produce an individual report of the group work. This report must clearly describe how the group created the network including details of wiring, installation and configuration of the network software. It must also describe how they set up users and enabled users to access their own allocated area and other resources. Candidates’ evidence must clearly show their individual contribution to the group work and this must meet the requirements of the assessment criteria.

Candidates must work safely when setting up equipment. They must also check the accuracy of their work and keep backup copies of all files.

**Grade C**
To achieve a C grade, students must show they have used a variety of different search engines for different purposes. Annotated screen prints could be used for this purpose. They must also show that they have located numerous relevant sources of information and software to meet their specified requirements and made appropriate references to them in the report.

They will show a good understanding of the use of LAN and WAN computer networks, their design, construction, installation and configuration as well as Internet communications.

Candidates must carefully plan their work. They should work independently to meet a given deadline, once they have acquired the necessary knowledge and understanding. This requirement does not mean without teacher intervention or assistance, rather it means that students do not display undue dependence. The agreed deadline may be re-negotiated between the candidate and teacher to take into account unforeseen circumstances.

**Grade A**
For this grade students must show, using annotation as necessary, that they can correctly and appropriately use e-mail distribution lists. They must also be able to use reply techniques being aware of the danger of replying to e-mail sent to a list of names. They must also be able to check that their transmitted e-mail has been delivered or read. They must also demonstrate that they are able to make good use of e-mail filing and management systems, including the use of address books.

Candidates should produce a fully detailed specification for the computer network. This must include detailed hardware specifications for the cables, connectors, hub/MAU if used and the network interface cards or radio devices. It must also include detailed software specifications for the network interface adapter, the network client system and all the protocol and network services required.

Candidates will show most of their activities by keeping a comprehensive record of their use of e-mail and Internet systems.
These records must detail the date, time and duration of each communications session.

13.5 Resources

Students must have the facilities to install and to configure hardware and software.

13.6 Key Skills Guidance

This guidance is specific to unit, but for planning and delivery purposes, it should be read in the context of the whole Advanced VCE. This guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

Keys to attainment

These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.

Signposts

These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Students will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.

13.7 Communication Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• working in a small group to specify, install and configure a computer network</td>
<td>C3.1a Contribute to a group discussion about a complex subject.</td>
</tr>
<tr>
<td>• acquiring information about using the Internet and installing and configuring networks, for example by reading instruction manuals</td>
<td>C3.2 Read and synthesise information from two extended documents about a complex subject. One of these documents should include at least one image.</td>
</tr>
<tr>
<td>• producing their investigative reports or their specifications and records of practical work</td>
<td>C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image.</td>
</tr>
</tbody>
</table>

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• demonstrating their working computer network</td>
<td>C3.1b Make a presentation about a complex subject, using at least one image to illustrate complex points.</td>
</tr>
</tbody>
</table>
13.8 Working with Others Level 3

**Keys to attainment**

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing a specification for computer network, together with a working computer network</td>
<td>WO3.1 Plan complex work with others, agreeing objectives, responsibilities and working arrangements.</td>
</tr>
<tr>
<td></td>
<td>WO3.2 Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives.</td>
</tr>
<tr>
<td></td>
<td>WO3.3 Review work with others and agree ways of improving collaborative work in the future.</td>
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</tbody>
</table>

13.9 Improving Own Learning and Performance Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing an investigative report about the IT related topic.</td>
<td>LP3.1 Agree targets and plan how these will be met over an extended period of time, using support from appropriate people.</td>
</tr>
<tr>
<td></td>
<td>LP3.2 Take responsibility for their learning by using their plan, and seeking feedback and support from relevant sources, to help meet targets.</td>
</tr>
<tr>
<td></td>
<td>LP3.3 Review progress on two occasions and establish evidence of achievements, including how they have used learning from other tasks to meet new demands.</td>
</tr>
</tbody>
</table>

13.10 Problem Solving Level 3

**Keys to attainment**

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing a working computer network resulting from a group activity</td>
<td>PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach as necessary.</td>
</tr>
<tr>
<td>If students are:</td>
<td>There may be opportunities for them to develop the following Key Skills evidence:</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| • producing a working computer network resulting from a group activity | PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward.  
PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving. |
14.1 About this Unit

Interactive Multimedia can play an important role in entertainment, education and in providing information.

This unit helps you:

• to be critical of commercially produced interactive multimedia products
• to appreciate what is involved in the design and creation of multimedia presentations, including the hardware and software.

In this unit you will:

• learn about the demands that interactive multimedia makes on an ICT system
• design and make your own interactive multimedia presentations (you will be internally assessed on one major presentation)
• explore developments in interactive multimedia hardware and software

This unit is ideal for students who want to gain employment working with multimedia or to progress onto a Higher Education course in multimedia.

This unit is assessed through your portfolio work. The grade on that assessment will be your grade for the unit.

14.2 What You Need to Learn

For this unit, the topics you will learn about are:

• the demands interactive multimedia makes on an ICT system
• specifying an interactive multimedia presentation
• designing an interactive multimedia presentation
• creating an interactive multimedia presentation
• reviewing and evaluating an interactive multimedia presentation
• developments in multimedia.

You will also need to understand some technical terms and how to use them correctly.
### The demands interactive multimedia make on an ICT system

You must be able to describe:

- what demands using video and storing graphics images and sounds makes on a system
- how these demands can be dealt with

You must also know the meaning of the technical terms:

- compression
- resolution
- frames per second
- colour depth.

### Specifying an interactive multimedia presentation

You must be able to create a user specification for an interactive multimedia presentation and be able to decide the purpose of your presentation:

- who is going to use your presentation (the intended audience)
- what messages you are trying to convey
- what you will include (the content).

### Designing an interactive multimedia presentation

You must learn how to:

- write a script for your presentation
- use design methods like story boards or flowcharts
- incorporate a structure to show alternative paths through your presentation
- write a user guide to accompany your presentation.

### Creating an interactive multimedia presentation

You must be able to:

- create, format and edit text
- create drawings, diagrams and charts
- take digital pictures, scan images and retrieve clip-art
- edit images, including clip-art
- import and convert text and graphics files
- record and edit sounds
- record and edit video clips
- build these elements (video, sound, images, drawings, diagrams, charts and/or text) into a presentation using an authoring package
- incorporate interaction between the viewer and the presentation
- test and edit your presentation
- when you incorporate material not created by yourself, you must be aware of copyright restrictions and know how to obtain necessary permissions.
You must also know the meaning of these technical terms:

- scan
- image
- authoring
- button
- hypertext/hot spot/sensitive response area
- digital camera
- video capture.

You must be able to describe:

- What makes a good interactive multimedia presentation
- What makes a bad interactive multimedia presentation
- How your interactive multimedia presentation could be improved.

You must be able to:

- decide the overall impact on the audience, e.g. to inform, to shock, to amuse
- recognise any tactics being used, e.g. stereotyping, so that the actors appeal to certain sections of the audience, or creating an atmosphere by the use of music, the pace of filming, the setting, the clothes the actors wear, etc.
- decide where the multimedia presentation is appropriate and effective in communicating its message and encouraging the viewer to remember the message.

In deciding whether a multimedia presentation is effective in communicating its message, you must also be able to take into account other considerations such as:

- the timing through the presentation – does the presentation flow?
- the content of the material presented – is there enough time to take in the message?
- developments in multimedia.

You must be able to give your opinions on:

- how current hardware developments may affect multimedia
- the current trends in multimedia software
- how multimedia might affect our lives in the future
- the meaning of the term: virtual reality.
Standard ways of working

Note: See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements, written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You need to learn to:

• edit and save work regularly, using appropriate names for your documents
• store your work where you and others can easily find it
• keep dated backup copies of files on another disk and in another location
• keep a log of ICT problems you met and how you solved them
• protect confidentiality and observe copyright laws
• avoid bad posture, physical stress, eye strain and hazards from workplace layout.
14.3 Assessment Evidence for Unit 8: Interactive Multimedia Presentations

You must produce:
- an interactive multimedia presentation supported by:
  - a user specification
  - a detailed design
  - a user guide
  - a test plan covering the technical workings of your presentation and also aspects of audience response
  - a guide to the demands interactive multimedia makes on computer hardware.

Note: the presentation must be substantial and should cover a range of user needs and presentation techniques.
- an evaluation of the new developments in multimedia.

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1  identify both the aims of your presentation and the intended audience</td>
<td>C1  use technical language accurately in your documentation</td>
<td>A1  evaluate your plan by identifying whether or not you have kept to it and explaining how it could have been improved</td>
</tr>
<tr>
<td>E2  show evidence of a detailed design by including:</td>
<td>C2  provide detailed evidence to show the planning involved in carrying out your research, creating your presentation and producing your documentation. Monitor your plans and change them if necessary</td>
<td>A2  produce a presentation which is imaginative in content and coherent for the user</td>
</tr>
<tr>
<td>- a script</td>
<td>C3  list the sources of information (for example books, magazines, Internet web pages etc.) that you considered using when designing your presentation and explain why you used or rejected information</td>
<td>A3  make recommendations regarding the hardware and software necessary to run your multimedia presentation effectively</td>
</tr>
<tr>
<td>- a storyboard</td>
<td>C4  produce attractive, clearly labelled and easy to use interactive facilities for the user</td>
<td>A4  provide evidence to show changes made to the user guide in response to suggestions made by others and comments made by users following these changes</td>
</tr>
<tr>
<td>- details of alternative paths through the presentation</td>
<td>C5  accurately describe the demands made on storage devices and processor performance by your presentation and explain methods used to overcome limitations</td>
<td>A5  evaluate your completed presentation to check that the original aims have been met, identify its good and bad points and explain how you might improve it based upon the test programme you carried out</td>
</tr>
<tr>
<td>E3  produce suitable text, graphics, sound and video</td>
<td>C6  test your user guide and note improvements suggested by others</td>
<td>A6  include evidence of research you have done into how future developments in multimedia could affect your clients and draw conclusions about how this might affect your multimedia presentation.</td>
</tr>
<tr>
<td>E4  use suitable fonts and colours</td>
<td>C7  provide evidence of comments made by sample users and explain how you changed your presentation to accommodate their suggestions.</td>
<td></td>
</tr>
</tbody>
</table>
14.4 Essential Information for Teachers

Guidance on delivery

Students need to have successfully completed Unit 1: Presenting Information, prior to starting this unit, as many of the skills gained will help students to prepare for the work involved. However, students will also need to develop the additional skills required. It is, therefore, likely that a good deal of teaching will be needed before students fully understand the technical terms and the complexity of preparing a multimedia presentation.

Prior to commencing the assessment for the unit, students need to gain familiarity with the software and hardware available to them. They will need to practice recording and editing sound and video clips, using digital cameras and scanners, and incorporating these elements into a multimedia presentation.

It is suggested that students could spend some time working in small groups to look at examples of professionally prepared multimedia presentations and:

- discuss the ways in which the presentations have been put together
- the impact upon the audience
- the effectiveness of the finished product
- the good and bad points of the presentation.

They could also spend time working in pairs to prepare the design of a multimedia presentation, perhaps by creating a storyboard or by writing a script. This could be used as the basis for creating a practice multimedia presentation.

For the final presentation, however, it is essential that students work individually to design, create and test their own multimedia presentation in order to produce the necessary assessment evidence.

Students will need to identify an appropriate application to use for the production of their presentation. Teachers will need to provide careful guidance to students to ensure that the students are not attempting to design and create a multimedia presentation that is too trivial or one which is too complex given the time that is available.

In order to provide assessment evidence, it is important that students have a ‘user’ who can be involved with the testing. Ideally this will be an organisation or individual outside the school or college. Where this proves difficult, students may create their multimedia presentation for other groups of students, teachers or departments.

Guidance on assessment

The result of your assessment of candidate evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification which in turn is used to generate a qualification grade.
The mark you award must take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark you determine for a particular student is based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements you should consider the following general qualities that distinguish between the grades:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.

**Grade E**

To achieve an E grade, the evidence should provide coverage of all the requirements stated in E grade criteria of the assessment grid. It may be however that a student has demonstrated considerable effort and skill in some areas at the expense of precise detail in another. Professional judgement should be used to decide what is a reasonable expectation of the student and whether the stated quality and sufficiency requirements have, on balance, been met.

At this level candidates should be able to accurately describe new developments in multimedia hardware and software applications. They should also be able to explain, in general terms, the effects upon processor performance and storage devices of running their multimedia presentation.

When documenting their multimedia presentation, candidates should clearly identify the intended audience for the presentation and clearly explain the aims of the presentation. Evidence should be provided to show that the multi-media presentation has been designed prior to implementation. The design can be provided in many different ways such as a storyboard or a script showing alternative paths through the system. A list should be provided showing sources of information.

Candidates must implement their designs using an appropriate software package and present the finished product to the user.

At this level, candidates must be able to produce suitable text, graphics, sounds and video using suitable fonts and colours. The content should be accurate with no spelling mistakes. At least one of the sound and one of the video clips/graphics elements included in the presentation should be created by him/herself, although it is expected that clip-art, and sound clips will also be incorporated into the presentation. There must be more than one path through the presentation.

Candidates must test the presentation to ensure that it works as expected and that it meets the user requirements. Some evidence should be provided to show that the candidate has responded to user comments.

A user guide should be included which states the purpose of the presentation and covers system requirements, how to install the presentation and how to use it.
Grade C  To achieve a grade C candidates must plan their work and work independently to meet agreed deadlines. The plans must be monitored and changed by negotiation between the candidate and the teacher to meet any unforeseen circumstances.

In addition to listing the sources of information, candidates should also show why they used some information and rejected other sources.

The finished presentation should be attractive, clearly labelled and have easy to use interactive facilities.

The candidate should use technical language accurately in the documentation produced.

A detailed test plan to test the working of the presentation should be provided and testing should follow this plan, with evidence provided to show the outcomes. The user guide should be tested and improvements suggested by others should be noted.

Evidence should be provided to show how the student has changed the presentation to accommodate suggestions made by users.

Grade A  To achieve an A grade candidates must use technical language fluently, and produce a multimedia presentation that is coherent for the user, accurate, user friendly, imaginative in content.

Candidates should evaluate their plans to identify whether or not they have been kept to and how they could have been improved.

The documentation provided should include recommendations, with reasons, regarding the hardware and software needed to run the presentation effectively.

The complete presentation should be evaluated to check that the original aims have been met. It should also include a discussion of the good and bad points of the presentation with comments upon how it may be improved based on the test programme carried out. The user guide should also be evaluated to ensure that it fully meets the needs of the user. Evidence should be included to show changes made to the presentation or the user guide as a result of suggestions made by the user.

At this level, the candidates should include evidence of research to show how future developments in multimedia could affect the lifestyle of the user.

14.5  Resources  Students must have access to multimedia presentation software with the functionality given under “creating an interactive multimedia presentation”.
14.6 Key Skills Guidance

This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

Keys to attainment

These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.

Signposts

These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Students will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.

14.7 Communication Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• presenting your multimedia presentation to your audience</td>
<td>C3.1b Make a presentation about a complex subject, using at least one image to illustrate complex points.</td>
</tr>
<tr>
<td>• producing the user guide to your multimedia presentation</td>
<td>C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image.</td>
</tr>
</tbody>
</table>

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• discussing the content and structure of the presentation</td>
<td>C3.1a Contribute to a group discussion about a complex subject.</td>
</tr>
</tbody>
</table>
14.8 Working with Others Level 3

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• evaluating multimedia presentations</td>
<td>WO3.1 Plan complex work with others, agreeing objectives, responsibilities and working arrangements.</td>
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<tr>
<td></td>
<td>WO3.2 Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives.</td>
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<td></td>
<td>WO3.3 Review work with others and agree ways of improving collaborative work in the future.</td>
</tr>
</tbody>
</table>

14.9 Improving Own Learning and Performance Level 3

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing an interactive multimedia presentation</td>
<td>LP3.1 Agree targets and plan how these will be met over an extended period of time, using support from appropriate people.</td>
</tr>
<tr>
<td>• researching and evaluating new developments in multimedia</td>
<td>LP3.2 Take responsibility for their learning by using their plan, and seeking feedback and support from relevant sources, to help meet targets.</td>
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<tr>
<td></td>
<td>LP3.3 Review progress on two occasions and establish evidence of achievements, including how they have used learning from other tasks to meet new demands.</td>
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</tbody>
</table>

14.10 Problem Solving Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing an interactive multimedia presentation</td>
<td>PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach as necessary.</td>
</tr>
</tbody>
</table>
### Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing an interactive multimedia presentation and supporting documentation</td>
<td>PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward.</td>
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<tr>
<td></td>
<td>PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving.</td>
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</tbody>
</table>
15.1 About this Unit

This unit helps you to:

• develop skills needed when producing artwork for inclusion in publications
• improve your skills in manipulating computer-based images
• sample the kind of work undertaken by designers, illustrators, newspaper artists and draughtspersons

In this unit you will:

• extend previous IT graphics work
• cover the skills and techniques used in the creation and editing of artwork using IT tools
• work alongside a client whose needs you must meet
• research a brief, plan a response, and produce a quality solution.

The unit builds on both Advanced Unit 1: Presenting Information, and Intermediate Unit 6: Graphics and Desktop Publishing. It has links with Advanced Units 8: Interactive Multimedia Presentations, 10: Publishing and 11: Internet Services and Web page Design. It could also build on National Curriculum work in Art and Design and Technology and complement GCE A/AS level work in those subjects.

This unit may be useful if you want to use your artistic skills along with your ICT skills in your career.

This unit is assessed through your portfolio work. The grade on that assessment will be your grade for the unit.

15.2 What You Need to Learn

For this unit, the topics you will learn about are:

• presentation graphics (slideshow) software
• vector-based drawing software
• bit-mapped painting software
• software and hardware features
• the need for a personal portfolio
• working to a commission
• developing and editing images
• final printed output.
<table>
<thead>
<tr>
<th>Software Type</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation graphics (slideshow)</td>
<td>You must know about the facilities available in presentation graphics</td>
</tr>
<tr>
<td>software</td>
<td>software to produce screen-based slides of information, and be able to:</td>
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<td></td>
<td>• use different types, styles, thicknesses and other attributes for text,</td>
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<tr>
<td></td>
<td>lines and fills</td>
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<tr>
<td></td>
<td>• apply shading and rendering</td>
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<tr>
<td></td>
<td>• import images</td>
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<td></td>
<td>• include the features of object overlay, borders</td>
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<td></td>
<td>• control grid, guide, ruler, snap and lock</td>
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<td></td>
<td>• use appropriate scale and size</td>
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<td></td>
<td>• include polygons</td>
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<tr>
<td></td>
<td>• utilise object libraries, including clipart</td>
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<tr>
<td></td>
<td>• devise storyboards, and decide timing</td>
</tr>
<tr>
<td></td>
<td>• produce a slide presentation</td>
</tr>
<tr>
<td></td>
<td>• create a default or master slide.</td>
</tr>
<tr>
<td>Vector-based drawing software</td>
<td>You must know about the facilities available in drawing software to</td>
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<td></td>
<td>produce screen-based images and printed copy, and be able to:</td>
</tr>
<tr>
<td></td>
<td>• use types, styles, thicknesses and other attributes for text, lines</td>
</tr>
<tr>
<td></td>
<td>and fills</td>
</tr>
<tr>
<td></td>
<td>• apply shading and rendering</td>
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<td></td>
<td>• include borders</td>
</tr>
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<td></td>
<td>• control grid, guide, ruler, snap and lock</td>
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<td></td>
<td>• use appropriate scaling and dimensioning</td>
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<td></td>
<td>• include perspective and orthographic projection</td>
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<td></td>
<td>• use bezier curves and polygons</td>
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<tr>
<td></td>
<td>• import images</td>
</tr>
<tr>
<td></td>
<td>• group and ungroup objects</td>
</tr>
<tr>
<td></td>
<td>• bring objects to front of others/push to back of others</td>
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<tr>
<td></td>
<td>• include the feature of object overlay</td>
</tr>
<tr>
<td></td>
<td>• utilise object libraries, including clipart, symbols, flow/organisation charts.</td>
</tr>
<tr>
<td>Bit-mapped painting software</td>
<td>You must know about the facilities available in painting software to</td>
</tr>
<tr>
<td></td>
<td>produce screen-based images and printed copy, and be able to:</td>
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<tr>
<td></td>
<td>• control image resolution, size and colour depth</td>
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<tr>
<td></td>
<td>• use different styles, e.g. text, brush, fill</td>
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<tr>
<td></td>
<td>• use tools to cut, copy, move, crop, mask and paste</td>
</tr>
<tr>
<td></td>
<td>• include polygons</td>
</tr>
</tbody>
</table>
• use colour (hue, tint and saturation), colour inversion and key colour

• apply colour separation and balance (CMYK, RBG)

• apply shading

• repeat a pattern, e.g. full, half drop

• understand technical terms, e.g., washing, dithering, pixellation, posterisation, edge-finding and distortion, and apply them appropriately.

Software and hardware features

You must understand the hardware and software implications of computer artwork, including:

• processor type and speed

• output devices and drivers, e.g. printers, plotters

• storage media devices, e.g. hard disc, floppy disc, CD

• input devices, e.g. keyboard, scanner, digital camera, video recorder, selection device, VDU

• different operating systems

• need to set-up printer to cope intensity of colour and contrast

• memory requirements of both RAM and ROM

• supporting applications software, such as word-processing and graphics packages

• different background styles, e.g. using a graph paper style for graphs, presenting charts on a background as it may appear in a student's workbook, presenting newspaper articles to look like extracts from a newspaper, making a shopping list look hand-written on a notepad

• scientific and mathematical material, e.g. chemical formulae, or mathematical diagrams including common shapes with angles marked appropriately or complex diagrams, e.g. the construction of the eye or ear in Biology, or soil composition in Geography, all suitably laid out and labelled

• hand-drawn cartoons or sketches to illustrate a point

• a variety of styles to meet the needs of different audiences, e.g. for very young children, for college students, or for those interested in particular hobby.

Working to a commission

To produce material for a client you must be able to:

• negotiate a brief with the client

• consider IT tools available

• choose a suitable solution to meet the needs of your client

• plan your presentation of your portfolio of ideas to your client

• get product approval from your client.
Developing and editing images

Images may be created freehand or taken from existing sources. You must learn how to capture images from:

- digital cameras
- video cameras and players
- scanners
- on-line information systems.

You must then be able to develop images by:

- sharpening
- removing scratches/blemishes
- darkening/lightening shadows (dodge/burn)
- colour correction (loading).

You must learn how to import charts and graphs from other packages.

You must understand the effect of file format, screen, scanner and camera resolution on an image.

Final printed output

You must know what range of effects can be achieved by printing on different types of printer, e.g. laser, dot-matrix, bubble-jet, colour, monochrome and on different media, e.g. different colours and qualities of paper, fabrics, acetate.

You must understand:

- the effect of printer resolution on the quality of the final image
- the processes that are used by commercial business to print images.

Standard ways of working

Note: See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You must learn to:

- edit and save work regularly, using appropriate names for your documents
- store your work where you and others can easily find it
- keep dated backup copies of files on another disk and in another location
- keep a log of ICT problems you met and how you solved them
- protect confidentiality and observe copyright laws
- avoid bad posture, physical stress, eye strain and hazards from workplace layout.
You must produce:

- a portfolio of samples that show your competence in creating graphic images using a variety of software packages
- material to document the solution to a design brief. This should include:
  - three design images, at least one bit mapped image and one vector graphic images
  - requirements of the brief
  - initial ideas to meet the brief
  - final production of the artwork
  - evaluation of the end result
- demonstration of presentation software and charting software should be included in the presentation to the client.

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
</table>
| E1 produce clear and complete notes following a briefing from the client incorporating:  
  • notes demonstrating a discussion of client needs related to capabilities of hardware and software,  
  • specification of what needs to be included in the final publication  
  • schedule for completion of the work | C1 demonstrate that you have agreed intermediate deadlines and kept to them  
  C2 demonstrate that you have edited an imported image to enhance the document  
  C3 demonstrate, by presenting original draft copies and annotations, how you:  
  • achieved a coherent and consistent style  
  • placed information in appropriate positions  
  • ensured correct and meaningful content  
  C4 gather external feedback as to the appropriateness of the design and present the findings using a statistical package  
  C5 comment on the feedback and incorporate any appropriate changes for the benefit of the client. | A1 demonstrate the ability to be critical in selecting appropriate material for inclusion in your final product  
  A2 demonstrate, in your final-product, a variety of methods to capture and develop images  
  A3 demonstrate individuality and imagination in the sample work and the finished product  
  A4 evaluate the finished portfolio of artwork and make recommendations for improvements:  
  • how well it meets the needs of the client  
  • what future developments might be possible  
  • what difference there would be in your approach if you had to start the brief again. |
| E2 produce:  
  • outline sketches of your initial design for client approval  
  • production details of the final realisation of the brief | | |
| E3 produce a series of draft graphic documents showing images with a range of enhancements | | |
| E4 produce evidence to demonstrate a discussion of the draft documents with the client specifying improvements and alterations necessary | | |
| E5 produce the final realisation of the agreed design, using a combination printed images and presentation graphics software. | | |
15.4 Essential Information for Teachers

Guidance on delivery

The evidence requirements for a range of samples could be adopted from Units 1: *Presenting Information* or 2: *ICT Serving Organisations*. Students will need to exercise various skills and quite a number of pieces before they are ready to produce their best quality work for their portfolios.

This unit attaches importance to accuracy and suitability of samples which should ensure that students spend time thinking about the quality of what they wish to include in their portfolios as well as what they want to communicate to the “client”. This unit focuses on the quality of the content and the technical capability of the students but they also learn from experience and guidance how to improve their presentations through their use of techniques like white space.

Acquaintance with graphic presentations from different sources enables the student to examine the quality of required for a wide range of different situations. Plenty of real examples can be found of inadequate or inappropriate graphic presentations as well as those which cover their topics well. It may be useful to build a collection of presentation extracted from diverse sources, for students to copy or develop. Typical sources are

- clip art
- Internet graphics libraries
- scanned images from technical journals, newspapers and magazines
- CDs
- advertisements

While students need to spend a lot of time practising techniques, they should also discover other tools that can improve their presentations such as the addition of video clips, sound clips or voice-overs as well as Internet links.

Tasks should not become checklists for techniques. The key to success is for students to use a variety of suitable techniques and use them sensibly. A wide choice of graphic packages and presentation managers should give opportunity for variety, but there is no need to drag in every technique listed in ‘What You Need to Learn’. The presentation for the client will depend on the needs identified with the client, but ought to be a topic, which interests the student and has enough scope for students to show their skills.

Group work brings enormous benefits to students. The task of collecting graphic examples enables each student to contribute half a dozen samples, giving an individual critique. The ensuing discussion should help to generate ideas about what constitutes good and bad presentational style. There should be no problem regarding authenticity if each student writes individual comments on a sample of the group’s collection. Allied to presentational techniques, these activities should help students to write and present their work clearly, succinctly and effectively.
Guidance on assessment

The result of your assessment of candidate evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification which in turn is used to generate a qualification grade.

The mark you award must take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark you determine for a particular student is based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements you should consider the following general qualities that distinguish between the grades:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.

Grade E

To achieve an E grade, the evidence should provide coverage of all the requirements stated in the E grade criteria of the assessment grid. It may be however that a student has demonstrated considerable effort and skill in some areas at the expense of precise detail in another. Professional judgement should be used to decide what is a reasonable expectation of the candidate and whether the stated quality and sufficiency requirements have, on balance, been met.

The candidate must produce samples that are clearly matched to purpose and which use correct techniques and layouts that work effectively to serve that purpose. Some samples must contain a variety of information types, including graphics and tables. These elements should be combined in an ordered, not haphazard, manner. Elementary graphical skills should be demonstrated in the choice and use of graphical editing tools and the formatting of the completed example.

Graphic samples should show clear differentiation in styles and methods, with each style being matched to purpose. Candidates should be expected to check their work and to achieve a reasonable standard of accuracy of content.

Graphic samples originated by the student must be clear and easy to understand and presented in an appropriate style. It must also meet with the approval of the client, and therefore fit for its purpose.

Show that the candidate has carefully checked the accuracy of the document content and its layout and kept backup copies of files...
Grade C  To achieve a C grade the student’s graphic samples must be of good quality with the content well matched to purpose. They must be consistent and appropriate style throughout each item and should make good use of standard formats to achieve an effective presentation.

The report to the client is an important element here and the student should pay particular attention to its preparation.

The notes describing the content, layout and purpose of the document should show more than a superficial understanding of the design layout used and should clearly identify the important features of the design.

The candidate should be able to make good use the graphic design software to accomplish ordinary tasks without support and help. They should be able to design a suitable questionnaire or some other valid technique in order to sample third party opinion as to the designs offered to the client. These findings should be presented using a suitable statistical package.

When candidates have acquired the necessary knowledge and understanding, they should plan carefully and work independently to meet the client’s deadline. This requirement does not mean without teacher intervention or assistance, rather it should be interpreted to mean that the candidate does not display undue dependence. The agreed deadline may be one that has been re-negotiated between the candidate, the client and the teacher to meet unforeseen circumstances.

Grade A  To achieve an A grade candidates should produce a well-presented document for the client. This should show that the student has paid particular attention to detail, such as layout, removal of errors and shows a good understanding of presentation techniques.

Checking, proof reading and correction of most errors in written and graphical documents is essential for an A grade. Proof-reading must be shown to correct more than just spelling errors. Repeated word or totally incorrectly used words should be found by proof-reading, as should layout and design errors. Complete freedom from errors is not essential but the removal of most obvious errors should be achieved.

The choice of fonts for body text and headings etc. will be well-matched to the purposes of the documents and elements will be carefully and consistently positioned. Documents should give an overall impression of having been designed for a purpose.

The candidates’ evaluation will be quite comprehensive and will contain appropriate and fluent technical language and should be coherent and easy to read. It will also identify good qualities in the designs produced as well as poor features that need to be improved together with suggestions for such improvement.
15.5 Resources

Students must have access to presentation/slideshow software; vector-based drawing and bit-mapped painting software. They must also have the facility to create their own images using digital cameras, video cameras & players, scanners and on-line information systems.

15.6 Key Skills Guidance

This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

Keys to attainment

These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.

Signposts

These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Candidates will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.

15.7 Communication Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• creating a screen presentation</td>
<td>C3.1b Make a presentation about a complex subject, using at least one image to illustrate complex points.</td>
</tr>
<tr>
<td>• collecting information from different sources for use in your samples and client report</td>
<td>C3.2 Select and synthesise information from two extended documents about a complex subject. One of these documents should include at least one image.</td>
</tr>
<tr>
<td>• evaluating your work</td>
<td>C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image.</td>
</tr>
<tr>
<td>• choosing and using appropriate writing styles, language and layout for your client report</td>
<td></td>
</tr>
<tr>
<td>• checking accuracy and proof</td>
<td></td>
</tr>
</tbody>
</table>
Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• discussing the software with the client</td>
<td>C3.1a  Contribute to a group discussion about a complex subject.</td>
</tr>
</tbody>
</table>

15.8 Application of Number
Level 3

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• investigating the capabilities of hardware and software</td>
<td>N3.1  Plan, and interpret information from two different types of sources, including a large data set.</td>
</tr>
</tbody>
</table>

15.9 Working with Others
Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• discussing the draft documents with the client, specifying improvements and alterations</td>
<td>WO3.1  Plan complex work with others, agreeing objectives, responsibilities and working arrangements.</td>
</tr>
<tr>
<td></td>
<td>WO3.2  Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives.</td>
</tr>
<tr>
<td></td>
<td>WO3.3  Review work with others and agree ways of improving collaborative work in the future.</td>
</tr>
</tbody>
</table>
### 15.10 Problem Solving Level 3

#### Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
</table>
| • producing material to document the solution to a design brief | PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward.  
PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach as necessary.  
PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving. |
16.1 About this Unit

This unit helps you:

• to appreciate the uses of DTP, WP and Computer Art packages and their capabilities
• to recognise the variety of documents produced using DTP facilities
• to recognise the hardware and software implications of using DTP.

In this unit you will:

• consider a clients needs
• design a draft document(s) to meet the requirements of this brief
• design your own graphics and create the textual context for the document(s)
• produce and present final copy using DTP software.

This unit links Advanced Units 1: Presenting Information and 9: Computer Artwork.

This unit may be useful if you plan to pursue a career in the media or publishing, and offers the possibility of branching into marketing.

This unit is assessed through your portfolio work. The grade on that assessment will be your grade for the unit.

16.2 What You Need to Learn

For this unit, the topics you will learn about are:

• document types and presentation styles
• design planning and presentation
• software and hardware features
• text and images.

Document types and presentation styles

You must understand how publishing techniques are applied to create a variety of presentation styles for the following document types:

• billboards and posters
• books and manuals
• brochures/leaflets and newsletters
• forms and mailshots
• magazines and newspapers
• reports
• suites of stationery.
Design planning and presentation

You must be able to follow publishing industry procedures when planning and presenting a document:

- during the design stage
- when enhancing and presenting text
- during the final production stage
- in dealing with external factors.

For the drafts/design stage, this will include:

- following house styles
- creating master page layouts
- presenting page proofs for reading
- producing artwork sketches
- setting text orientation
- creating style sheets.

For the enhancement of presentation of text, you must know about and, where appropriate, be able to use:

- watermarks
- greeking and latining
- repeating elements
- special characters
- ruler grid lines
- callouts/labels
- automatic generation, for example of notes, an index and a contents list.

You must understand, and be able to use correctly, the terms which describe the final production stages:

- colours of print, e.g. CMYK separation and paper
- paper weights and sizes, e.g. 80 gm, A4
- CRC (camera ready copy)
- binding/folding
- white space
- proof-reading
- printing devices and services
- proof-reading symbols according to BS5261 Part 2 (1976)
- storage media used
- resources used.
You must know about external factors in the production process:

- problems that may arise, such as meeting deadlines, and working within a team of freelancers
- legislation (copyright) and how to obtain permissions for use of copyright material
- matching the intended audience and meeting a need
- gaining client brief, e.g. having sample portfolio material and published work to show the client, and receiving information on house styles to be followed and expected volumes of work to be produced within a given time-scale
- making a presentation to the client to gain approval
- keeping within budgeted costs.

Software and hardware features

You must understand the hardware and software implications of DTP, including:

- processor type and speed
- output devices and drivers, e.g. printers, plotters, VDU
- storage media devices, e.g. hard disc, floppy disc, CD
- input devices, e.g. keyboard, scanner, digital camera, video recorder, selection device
- different operating systems
- memory requirements of both RAM and ROM
- supporting applications software, such as word-processing and graphics packages.

Text and images

You must be able to import and export text and images using different file types:

- bitmap and vector graphic files
- word-processed files
- chart and graph files
- compressed files
- ASCII and DOS text files.

You must be able to incorporate the following text styles into documents:

- headings, sub-headings
- body text
- footnotes, end notes
- bullets
- figure captions, figure numbers
- headers, footers
• tables
• lists.

You must be able to apply the following text attributes into documents:
• bold, underline, italic
• superscript, subscript
• overscore
• case (upper, lower)
• font size and style.

You must be able to choose and incorporate appropriate text styles and text attributes for your documents.

You must be able to edit your document and use editing tools for:
• setting margins, e.g. top, bottom, left, right
• formatting, e.g. setting attributes, fonts, case
• justification, e.g. centre, left/unjustified, right, full/justified
• tabulation, columns, gutters
• leading, kerning
• alignment, e.g. vertical, horizontal, indentation
• pagination, avoiding windows/orphans
• grammar check, spell check, hyphenation control.

You must be able to use GUI editing facilities:
• cut
• copy
• paste
• move.

You must be able to use and configure hardware and software for creating and editing images, including:
• scanning at different resolutions, e.g. 300 dpi, different styles, e.g. line art or half-tone and different colour depth
• file conversion
• file handling
• anchoring
• colour techniques, e.g. shading
• graphic manipulation, e.g. mirror, rotate, size, cropping, grid, zoom, group, ungroup, scale, translate
• drawing, e.g. lines, brush, fill, spray, shapes, textures, colours, text, arrows
• artistic text.
You must be able to use page layout techniques effectively, including:

- text boxes
- use of layering, e.g. move to back, move to front
- borders
- shading.

Standard ways of working

Note: See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You must learn to:

- edit and save work regularly, using appropriate names for your documents
- store your work where you and others can easily find it
- keep dated backup copies of files on another disk and in another location
- keep a log of ICT problems you met and how you solved them
- protect confidentiality and observe copyright laws
- avoid bad posture, physical stress, eye strain and hazards from workplace layout.
You must produce material to document the solution to a given design brief.

The design brief must be such that the final product consists of at least 10 A4 pages of CRC and must include a demonstration of booklet production. This must include:

- notes from a discussion with the client specifying the requirements of the brief
- a schedule for completion of the work
- discussion of the capabilities of the hardware and software available
- consideration of a house style for the client
- production of an initial draft design plan
- evidence of client involvement in choosing the final design and suggested improvements
- camera ready copy (CRC) of the agreed design.

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
</table>
| E1 produce clear and complete notes following a briefing from the client incorporating:  
  - notes demonstrating a discussion of client needs related to capabilities of hardware and software  
  - notes demonstrating the consideration of previously published material to ascertain house style  
  - specification of what needs to be included in the final publication  
  - schedule for completion of the work.  
| E2 produce:  
  - outline sketches of your initial design for client approval  
  - production details of the final realisation of the brief  
  - reproduction costs and production/distribution methods.  
| E3 produce a series of draft documents showing text and images with a range of enhancements  
| E4 produce evidence of proof-reading the work.  
| E5 produce evidence to demonstrate a discussion of the draft documents with the client specifying improvements and alterations necessary  
| E6 produce the final realisation of the agreed design to camera ready copy (CRC) stage.  
| C1 demonstrate you have agreed intermediate deadlines and kept to them  
| C2 demonstrate you have edited an imported image to enhance the document  
| C3 demonstrate, by presenting original draft copies with proof-reading corrections and annotations, how you:  
  - achieved a coherent and consistent style  
  - have made good use of standard formats  
  - placed information in appropriate positions  
  - ensured correct and meaningful content  
| C4 demonstrate evidence of all the necessary techniques to create an aesthetically pleasing booklet that is easy to reproduce.  
| A1 explain and justify any changes/amendments to the original design plan  
| A2 identify and explain house style to be followed in the production of the final document  
| A3 fully evaluate the publication that has been produced to include:  
  - how well it meets the needs of the client,  
  - what future developments might be possible,  
  - what difference there would be in your approach if you had to start the brief again.  
| A4 produce a guide to the client explaining how the final product can be altered at a later stage.  

16.4 Essential Information for Teachers

Guidance on delivery

This unit goes much further than conventional desktop publishing so teachers will need in-depth knowledge of the publishing process. A useful resource is *The Cambridge Handbook: Copy-editing for Editors, Authors and Publishers* by Judith Butcher, ISBN 0 521 40074 0, published by CUP.

For the proof-reading symbols conventions, a complete copy of B55261 Part 2 (1976) can be obtained from the British Standards institution, 2 Park Street, London W1A 2B5.

Students would benefit from access to a variety of graphic design and DTP software. It is intended that students will move beyond the use of features of word processing software. They will need to use microcomputer systems that have sufficiently fast processing, large RAM and enough storage space.

Students will need to have access to both black and white and colour printers to obtain good quality final outputs.

Centres are advised, where possible, to make use of scanning equipment, digital cameras and video recorders to prepare students for similar situations in a working environment.

Students should have access to a variety of textbooks on graphic design and publishing as well as manuals for the applications used. It will be necessary for students to collect relevant exemplar material in advance to give them ideas about what constitutes effective use of DTP and graphic programs.

Teachers need to design briefs to allow students to produce appropriate assessment evidence. Students should be provided with specific details about the evidence required, the audience and the timescale. This evidence should meet the needs of the real scenario.

Briefs that require the student to research materials extensively and provide justifications for their choices will receive a higher grade. These will probably be more obvious to candidates if real clients and tasks are encouraged.

Students should understand how to import/export different file types including:

- TIF, PCX, CMG, BMP, WMF.

Suitable scenarios may result in one or more of the following being produced:

- an advertising poster
- a flyer
- a suite of stationary
- a newsletter for a school or college
• a local newspaper
• a community magazine about local events
• a match day sports programme
• children’s books
• training manuals or user guides.

In the presentation, students should be encouraged to collect all evidence (notes, comments, etc) in order to be able to make justifications as to their final design.

Guidance on assessment

The result of your assessment of candidate evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification which in turn is used to generate a qualification grade.

The mark you award must take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark you determine for a particular student is based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements you should consider the following general qualities that distinguish between the grades:

• increasing depth and breadth of understanding
• increasing evaluation, analysis and synthesis
• increasing independence and initiative.

Grade E

To achieve an E grade the evidence should provide coverage of all the requirements stated in the E grade criteria of the assessment grid. It may be however that a student has demonstrated considerable effort and skill in some areas at the expense of precise detail in another. Professional judgement should be used to decide what is a reasonable expectation of the student and whether the stated quality and sufficiency requirements have, on balance been met.

The purpose of the publication should be clearly stated and related to the clients needs.

The candidate must produce a publication that is clearly matched to purpose and which uses writing styles and layouts that work effectively to serve that purpose. It must contain a variety of information types including graphics. These elements should be combined in an ordered not haphazard manner. Good typographical skills should be demonstrated in the choice and use of fonts and the formatting of text.

Candidates should be expected to make effective use of spell checkers and other aids, together with careful proof-reading, to achieve a reasonable standard of accuracy of content.
Information originated by the student must be clear and easy to understand and written in an appropriate style. It must also be written at an appropriate level to suit the intended readers.

Candidates must demonstrate that they have carefully checked the accuracy of the document content and its layout and kept backup copies of files.

Grade C  To achieve a C grade the candidate’s documents must be of good quality with layout and content well matched to purpose. They must have a clear, consistent and appropriate style throughout each document and should make good use of standard formats to achieve an effective presentation. They must demonstrate necessary techniques in booklet production as well as compiling single sheets.

Draft copies of the publication will show how a standardised format and an appropriate and consistent style were achieved.

The notes describing the content, layout and purpose of the publication should show more than a superficial understanding of the design layout used and should clearly identify the important features of the publication.

The candidate should be able to make good use of document creation software and should be able to accomplish ordinary tasks without support and help. They should be able to find and use options for formatting text and importing and editing images.

When candidates have acquired the necessary knowledge and understanding, they should plan carefully and work independently to meet a given deadline. This requirement does not mean without teacher intervention or assistance rather it should be interpreted to mean that the student does not display undue dependence. The agreed deadline may be one that has been re-negotiated between the candidate and the teacher to meet unforeseen circumstances.

Grade A  To achieve an A grade candidates should produce well-written and well-presented publications of at least 10 A4 pages. This should show that the student has paid particular attention to detail such as layout and removal of errors. It will also show a good understanding of writing style.

Proof reading and correction of most errors in the publication is essential for an A grade. Proof-reading must be shown to correct more than just spelling errors. Repeated words or totally incorrectly used words should be found by proof-reading. Complete freedom from errors is not essential but the removal of most obvious errors should be achieved.

The candidate will produce a clear, accurate and detailed review of the publication. The student will need to discuss suitability for purpose, presentation, style, layout and possible improvements. Any changes made to the original design plan for the publication should be explained and justified.
The candidates’ evaluation will be quite comprehensive and will contain appropriate and fluent technical language and should be coherent and easy to read. It will also identify good qualities in the publication produced as well as poor features that need to be improved together with suggestions for such improvement.

16.5 Resources
Students must have access to DTP/word processing and computer art software with functionality that meets the requirements of the unit. They should also have the facility to create and edit their own images.

16.6 Key Skills Guidance
This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

Keys to attainment
These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.

Signposts
These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Students will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.

16.7 Communication Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing draft design plan, notes and evidence of a discussion with the client</td>
<td>C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image.</td>
</tr>
</tbody>
</table>

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• discussing the requirements of the brief with the client</td>
<td>C3.1a Contribute to a group discussion about a complex subject.</td>
</tr>
<tr>
<td>• making presentations to client</td>
<td>C3.1b Make a presentation about a complex subject, using at least one image to illustrate complex points.</td>
</tr>
<tr>
<td>• collecting information to include in your publication</td>
<td>C3.2 Select and synthesise information from two extended documents about a complex subject. One of these documents should include at least one image.</td>
</tr>
</tbody>
</table>
16.8 Application of Number
Level 3

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• gathering information about production costs to inform the client</td>
<td>N3.1 Plan and interpret information from different types of sources, including a large data set.</td>
</tr>
<tr>
<td></td>
<td>N3.2 Undertake multi-stage calculations to do with:</td>
</tr>
<tr>
<td></td>
<td>a amounts and sizes;</td>
</tr>
<tr>
<td></td>
<td>b scales and proportion;</td>
</tr>
<tr>
<td></td>
<td>c handling statistics;</td>
</tr>
<tr>
<td></td>
<td>d rearranging and using formulae.</td>
</tr>
<tr>
<td></td>
<td>They should work with a large data set on at least one occasion.</td>
</tr>
<tr>
<td></td>
<td>N3.3 Interpret results of their calculations, present their findings and justify their methods. They must use at least one graph, one chart and one diagram.</td>
</tr>
</tbody>
</table>

16.9 Working with Others
Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
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<tr>
<td>• discussing the draft document with the client, specifying improvements and alterations</td>
<td>WO3.1 Plan complex work with others, agreeing objectives, responsibilities and working arrangements.</td>
</tr>
<tr>
<td></td>
<td>WO3.2 Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives.</td>
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<tr>
<td></td>
<td>WO3.3 Review work with others and agree ways of improving collaborative work in the future.</td>
</tr>
</tbody>
</table>

16.10 Problem Solving Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing material to document the solution to a given design brief</td>
<td>PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach to problem solving.</td>
</tr>
</tbody>
</table>
## Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
</table>
| • demonstrating booklet production | PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward.  
PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving. |
Advanced VCE Unit 11

Internet Services and Web Page Design

17.1 About this Unit

This unit helps you to understand:

- the requirements for setting up a web site
- technology related to the Internet
- the differences in the range of web programming languages available for web pages and components within them
- the differences between Internet and intranet sites, and the network security implications of running web servers.

In this unit, you will:

- set options on a web browser
- use software to develop web pages to convey relevant information to web site visitors
- set up pages on a website.

This unit links with Advanced Unit 7: Communications and Networks.

The use of the Internet and intranets has expanded rapidly over the last few years. In addition, there has been an increase in the requirement for people with the skills for setting up and managing websites. In this unit you learn to use Internet services and develop skills in using Internet tools. This will enable you to produce your own web pages, using information obtained from the Internet, and publish them.

This unit is assessed through your portfolio work. The grade on that assessment will be your grade for the unit.

17.2 What You Need to Learn

For this unit, the topics you will learn about are:

- Internet/intranet
- Internet services
- web server requirements
- Internet tools.
Internet/intranet

In an organisation, information sources are identified as being either external or internal. You must understand how Internet and intranet are used as sources of external or internal information for an organisation.

You must know about the organisation of the Internet including:

• domains and domain naming system (DNS)
• mode of access to the Internet, Internet access provider (IAP), Internet service provider (ISP), point of presence (POP) and Internet services (see below)
• international standards and protocols.

You must also be able to explain the effects of different band widths and transmission rates on the time to download web pages.

You must know about different methods of connection to the Internet, including:

• data connecting equipment (modem) and data terminating equipment (computer), connectors and cables
• analogue telephone lines, digital telephone lines (ISDN), leased lines, routers.

Internet services

You must be aware of the range of services available through the Internet and their purpose, including:

• e-mail
• WWW (world wide web)
• IRC (inter relay chat), conferencing
• newsgroups, Newsnet, bulletin boards
• file transfer
• Telnet.

Web server requirements

You must understand the hardware and software requirements for setting up a web site on a server including:

• the operating system
• web server software
• protocols (TCP/IP) (transfer control protocol/Internet protocol)
• Internet naming (DNS - domain naming system) and addressing systems
• security (firewalls, gateways)
• proxy servers.
Internet tools

You must understand the purpose of Internet tools so that you can select appropriate tools to carry out a specific task. The tools you must learn about are:

- browser software, bookmarks and search engines, for accessing and searching the Internet
- web programming languages, such as HTML (hypertext markup language), and VRML (virtual reality markup language), or other scripting language, for the creation of web pages or components of pages
- web page development software, for the creation of web pages
- graphic software, for editing graphics and converting file formats to Internet standards.

You must also be able to set up and use browser software, search engines and bookmarks:

- to access and search the Internet, to view existing websites to obtain ideas on layout
- to download graphics and information and scripting components, and be aware of issues of copyright, confidentiality and security in using information you have downloaded
- to set TCP/IP address, domain name, address of the start up home page and e-mail address set for users own use
- to access you own website.

You must also know about how websites are structured, including

- linear
- hierarchical
- web or mesh.

You must understand the need for planning and designing websites, including the preparation of documentation including:

- structure diagrams
- a storyboard
- a task list or action plan for development.

You must also be able to use web page development software to create, edit and present web pages containing

- text, graphics, numbers
- background and foreground features
- tables, forms, interactive features, e.g. full text search, table of contents; other appropriate components
- hyper links (text and graphic) within a web page, to another page at some web site, to an external WWW (world wide web) site, to e-mail, to an FTP server document.
You must be able to:

• use graphics software to edit graphics
• convert files to a required file format, to insert own web pages
• identify the HTML script used to create features on web pages
• edit a script to change the page layout.

Standard ways of working

Note: See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You need to learn to:

• edit and save work regularly, using appropriate names for your documents
• store your work where you and others can easily find it
• keep dated backup copies of files on another disk and in another location
• keep a log of ICT problems you met and how you solved them
• protect confidentiality and observe copyright laws
• avoid bad posture, physical stress, eye strain and hazards from workplace layout.
You must produce:

- a working website including:
  - design notes for the web pages
  - annotated printouts of own web pages in HTML format and changes made to script to alter layout
  - documentation of testing of website
- records showing options set in Internet browser software
- a report of Internet/intranet and server requirements.
<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
</table>
| E1  select and download at least two web pages as a resource for your designs, ensuring that you comply with copyright. This should include:  
  • two pages that provide ideas for your own page layout  
  • annotate important ideas in your design – these should include text, at least 2 graphics, number, hyperlinks to other pages, tables and forms | C1  work independently and meet agreed deadlines by carrying out work plans effectively  
C2  identify clearly what information you require from the WWW before using the browser software  
C3  explain clearly your reasons for choosing the pages that you have downloaded as a resource for your designs  
C4  include in your web pages:  
  • at least one form  
  • at least two hyperlinks to appropriate external WWW site pages selected by yourself  
  • at least one hyperlink to an e-mail address  
C5  annotate at least one page explaining script commands for page layout and components included in the page  
C6  edit script plans to change five aspects of page layout  
C7  set options for other Internet services you have used such as e-mail and news groups and explain the method of connection to the Internet and any security requirements for this link.  
C8  carry out testing on your website according to your test plan and revise test plan if appropriate  
C9  use technical terms and language accurately and consistently in your documentation. | A1  critically evaluate the design and structure of at least two websites that you have downloaded as a resource for your designs or to which your page links  
A2  include, in your web pages, at least one appropriate, interactive feature or other component using a different web language  
A3  clearly explain the reasons for the inclusion of text, graphics and external hyperlinks you have used  
A4  add script commands for at least two additional components to at least one web page, that are appropriate for the page being edited from:  
  • graphic  
  • table  
  • hyperlinks  
A5  review the pages in your website and analyse the strengths and weaknesses of your web pages taking into account any comments received from visitors to your website.  
A6  suggest and justify improvements that can be made to the story board and its implementation  
A7  evaluate an Internet system to which you are connected  
A8  carry out independently the simple editing of a scripted command (using a different web language) for one component to specification |
| E2  include in the design documentation:  
  • structure diagrams, the story board  
  • programming languages used  
  • Internet tools, graphic editing  
  • a task list or action plan | | |
| E3  set up within a hierarchical website, at least three pages which contains:  
  • text and numbers as required  
  • at least two graphics, at least two table  
  • background and foreground features  
  • hyperlinks (text and graphic) to other pages in the on-site as required to access all pages created, or pages being linked to home page | | |
| E4  produce printouts of your web pages annotated to explain the features on them  
E5  produce details of tests carried out on the websites which ensure that website visitors can access all you pages in the correct order  
E6  annotate at least one page identifying script commands used for text layout  
E7  produce a brief report containing:  
  • the organisation of Internet and intranet  
  • methods of connecting to the Internet  
  • web server requirements.  
E8  set options in browser software | | |
17.4 Essential Information for Teachers

Guidance on delivery

Some of the information in this unit is covered in Unit 7: *Communications and Networks*. Students may have had an introduction to some topics such as e-mail, access to the World Wide Web, and protocols in this unit.

In the report on Internet/intranet and server requirements students should include comments on all the major aspects of the topic as outlined in the unit. It is intended that this report be brief outlining server requirements only.

Students will need to investigate the services available on the World Wide Web and the Internet tools for creating web pages. They should have access to a variety of tools so that they can choose appropriate techniques for their web pages and have sufficient knowledge of the tools to be able to evaluate the work they have done.

If they wish, students can take this opportunity to produce a report for another part of the course and publish it on their web pages. This may be a report they are writing for this unit or another unit.

Many software packages are available for creating basic web pages and some word processors have facilities for creating HTML. In addition, students may need to gain some experience of using a script or language used to create more advanced features on their web pages. If they are to achieve a C or A grade then this will be essential.

Students should be able to set up their website and test it using a web browser. They should also be able to set preferences on the browser, for example to start up with their own home page.

A great deal of information on development tools and other Internet topics is available on the web and students may find this a useful resource as they develop their understanding of various tools.

Students may find the components and the scripts to go with these components on the Internet. Students may use any appropriate development tool including script they find on the web. Many components on web pages have script which can be read, copied, edited and developed by the user. Students may adapt such scripts for use in their own pages. More traditional sources of information are also available for reference to languages.

Guidance on assessment

The result of your assessment of candidate evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification which in turn is used to generate a qualification grade.

The mark you award must take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns.
Thus the overall mark you determine for a particular candidate is based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements you should consider the following general qualities that distinguish between the grades:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.

**Grade E**

To achieve an E, the evidence should provide coverage of all requirements stated in the E grade criteria in the assessment grid. It may be however that a student has demonstrated considerable effort and skill in some areas at the expense of precise details in another. Professional judgement should be used to decide what is a reasonable expectation of the candidate and whether the stated quality and sufficiency requirements have, on balance, been met.

In their design, the candidate must be able to present the initial draft design and the final web pages. The documentation that the design must be clear and showed the information sources for the pages and the layout of the different elements on the pages. It should be clear which languages and Internet tools have been used and why they are chosen. The pages should link together and be consistent in their design.

Candidates will need to print-out copies of the final web pages and copies in HTML format. These should be annotated to demonstrate the inclusion of a variety of components. A print-out of script commands is also required.

In the report on the Internet the candidate should demonstrate an understanding and experience of a range services and their use. The candidate should be able to explain clearly the requirements for setting up a website on a server.

**Grade C**

To achieve a C grade the candidate must produce an outline plan of their website. It should show details of the content of the website and any information sources they intend to use.

The candidate must explain clearly what information they want to acquire from the World Wide Web and the results of their search. They should give the reasons for choosing the pages they have and include more complex components in their web pages, e.g. a form, links to web pages, links to e-mail addresses.

The candidate should produce at least one page of script which is clearly annotated to explain how it produces a web page. In addition, the candidate should edit the script to change the layout and components. The new script should be tested and shown to produce the required results.
When candidates have acquired the necessary knowledge and understanding, they should plan carefully and work independently to meet a given deadline. This requirement does not mean without teacher intervention or assistance rather it should be interpreted to mean that the student to does not display undue dependence. The agreed deadline may be one that has been renegotiated between the candidate and the teacher to meet unforeseen circumstances.

**Grade A**

To achieve an A grade the candidate must show that they can use script in their pages. They must be able to incorporate a scripted component and be able to edit simple script commands. Also they must include an appropriate interactive feature in one page.

Candidates must also be able to analyse their own one pages and discuss the strengths and weaknesses of those pages, as well as websites they have linked to. They should be able to justify a their use of components in their web pages and suggest improvements to the design the pages.

To achieve an A grade the candidate should provide coverage of all the requirements of the assessment grid.

### 17.5 Resources

Students must have access to web development software and browser software.

### 7.6 Key Skills Guidance

This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

**Keys to attainment**

These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.

**Signposts**

These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Candidates will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.

### 17.7 Communication Level 3

**Keys to attainment**

<table>
<thead>
<tr>
<th>When students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• writing a report of Internet/intranet and server requirements, annotated printouts and testing documentation</td>
<td>C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image.</td>
</tr>
</tbody>
</table>
### Signposts

<table>
<thead>
<tr>
<th></th>
<th>C3.2 Select and synthesise information from two extended documents about a complex subject. One of these documents should include at least one image.</th>
</tr>
</thead>
<tbody>
<tr>
<td>•</td>
<td>producing design notes for the web pages</td>
</tr>
</tbody>
</table>

#### 17.8 Application of Number Level 3

#### Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• setting up a hierarchical website containing numbers and tables</td>
<td>N3.1 Plan, and interpret information from two different types of sources, including a large data set.</td>
</tr>
<tr>
<td></td>
<td>N3.2 Undertake multi-stage calculations to do with:</td>
</tr>
<tr>
<td></td>
<td>a  amounts and sizes;</td>
</tr>
<tr>
<td></td>
<td>b  scales and proportion;</td>
</tr>
<tr>
<td></td>
<td>c  handling statistics;</td>
</tr>
<tr>
<td></td>
<td>d  rearranging and using formulae.</td>
</tr>
<tr>
<td></td>
<td>They should work with a large data set on at least one occasion.</td>
</tr>
</tbody>
</table>

#### 17.9 Improving Own Learning and Performance Level 3

#### Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing a working website</td>
<td>LP3.1 Agree targets and plan how these will be met over an extended period of time, using support from appropriate people.</td>
</tr>
<tr>
<td></td>
<td>LP3.2 Take responsibility for their learning by using their plan, and seeking feedback and support from relevant sources, to help meet targets.</td>
</tr>
<tr>
<td></td>
<td>LP3.3 Review progress on two occasions and establish evidence of achievements, including how they have used learning from others to meet new demands.</td>
</tr>
</tbody>
</table>
## 17.10 Problem Solving Level 3

### Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• developing a website and associated documentation</td>
<td>PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach as necessary.</td>
</tr>
</tbody>
</table>

### Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• developing a website and associated documentation</td>
<td>PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward.</td>
</tr>
<tr>
<td></td>
<td>PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving.</td>
</tr>
</tbody>
</table>
18.1 About this Unit

This unit helps you:

• to understand how to set up and run a support service for ICT users

• to recognise when you can solve users’ problems yourself and when you need to refer their problems to others

• to understand the importance of safe working practices when providing user support.

To provide an effective user support service, you need to have a good knowledge of ICT systems and be able to develop procedures for handling enquiries, identifying problems, solving problems and keeping records.

In this unit, you will:

• learn about the procedures involved in running a user support service

• install and configure applications software

• use questioning and other techniques to diagnose users’ problems

• solve users’ problems either by direct action, or by giving advice, or by referring them to others.

In this unit, you will use the knowledge and skills in using applications software that you have gained in some of the mandatory units. It is recommended that you have some experience in using software packages at your installation before this unit is covered. This unit builds on Advanced Unit 4: System Installation and Configuration, which looks at setting up computer systems. This unit focuses on providing support and solving problems that might occur, including amending a system set-up.

You will find this unit valuable if you are considering employment in a user support role.

This unit is assessed through your portfolio work. The grade on that assessment will be your grade for the unit.

18.2 What You Need to Learn

For this unit, the topics you will learn about are:

• systems for providing user support services

• operating systems and user interface

• software installation, configuration and support

• hardware faults.
You must find out how to handle user enquiries, including:

- designing relevant documentation, e.g. user request forms, interview record forms and error or fault logs
- asking different types of questions, e.g. closed, open, restatement to help you to identify the problem
- classifying problems as hardware, software, operating systems, user knowledge or user skill
- logging problems either on paper or on computer and prioritising requests for support
- deciding what to do to solve the problem and solving the problem either by your own action, or by giving advice to the user, or by referring the user to someone else
- giving instructions to the user to enable them to carry out a specific task, e.g. making a backup of a file, printing a file
- keeping the user informed of progress
- keeping records of how you solved the problems.

You must be able to solve straightforward problems on your own, such as where a list of common faults provides the solution, e.g. a printer not working may be due to it not being plugged in, not being turned on, not being on-line, needing paper or the wrong printer driver being installed as default. If checking all these possibilities and fixing just one found to be in error, this would be classed as a straightforward problem.

For complex problems, the fault may be due to a combination of simple problems, but the fault still persists when only one is solved, e.g. the printer not working may be due to any two or more of the possibilities listed above. Fixing only one, does not cure the fault and further investigation is needed.

You must also know:

- when a written user guide might be useful
- what should be included in a written user guide
- the methods used when drafting a user guide, including testing and amendments.
You must be able to:

• carry out diagnostic routines
• recognise and overcome interrupt errors
• check and set IRQs
• configure start-up of call devices
• configure memory.

You must be aware of the benefits and limitations of operating systems, e.g. DOS, and user interfaces, e.g. menu, command, GUI, including:

• user friendliness
• windows, icons, mouse, pointers (WIMP) environments.

You must be able to amend a system set-up and test it, including:

• creating or amending set-up files to initialise equipment or provide the correct path to find files
• changing the configuration of the user interface, e.g. change colours, ports, mouse settings
• selecting the correct printer or other device drivers
• customising an existing user interface, e.g. by adding program icons, by creating a menu system.

You must be able to complete file management (housekeeping) tasks, including:

• building a directory structure
• backing up all or part of a system and restoring individual data files
• making copies of files and deleting files.

You must be able to follow procedures for system security, including:

• creating a systems disc
• checking for viruses
• protecting system and user files using password systems, file attributes and backup procedures.

Software installation, configuration and support

You must find out about what might affect the installation of a software package, including:

• the system configuration
• the memory requirements and the storage requirements
• the level of security required
• the type of installation, e.g. full, partial
• the type of licence.
You must be able to:

- identify what the user requires
- define the resources required to create a system to meet user needs
- install different types of software
- carry out full, partial and custom installations, and test the software installed
- change settings within the software to meet the users’ needs, e.g. which toolbars are displayed
- help the user to obtain the required output from the software, by producing simple application macros or templates.

**Hardware faults**

You must find out about:

- rules and regulations relating to electrical equipment
- health and safety guidelines.

You must be able to diagnose hardware problems either by observation, by questioning, or by simple diagnostic tests.

You must then be able to solve the problem by:

- checking the external electrical supply, e.g. by checking it is switched on
- checking and replacing leads
- cleaning the ball housing of a mouse
- formatting and changing the read/write protection of floppy discs
- replacing paper, ribbons, ink cartridges or toner cartridges, and clearing paper jams in printers
- adjusting the display of visual display units (VDUs)
- replacing faulty peripheral devices such as mice, printers, VDUs or keyboards.

You must not attempt to dismantle equipment unless instructed to do so by your teacher/supervisor.

**Standard ways of working**

**Note:** See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You need to learn to:

- edit and save work regularly, using appropriate names for your documents
- store your work where you and others can easily find it
- keep dated backup copies of files on another disk and in another location
- keep a log of ICT problems you met and how you solved them
- protect confidentiality and observe copyright laws
- avoid bad posture, physical stress, eye strain and hazards from workplace layout.
### 18.3 Assessment Evidence for Unit 12: Supporting ICT Users

**You must produce** records showing that you have set up and run a support service, supported by:
- a problem log with records of how you solved the problems and handled user inquiries and supporting documentation
- a draft and an amended copy of an appropriate user guide to help users with a problem you have identified and give notes on how you tested it.

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1  design and complete user support service documentation (i.e. user request forms and interview record forms), including details of the date and time of the call, the name and location of the user and brief notes of the problem</td>
<td>C1  plan how you will set up and run your user support service, including deciding what documentation you need</td>
<td>A1  evaluate your approach to setting up and running your support service and how well it operated, and suggest ways in which you could have improved the service you provided</td>
</tr>
<tr>
<td>E2  solve straightforward problems, and provide screen prints or other documentation (where possible) including:</td>
<td>C2  monitor how well your support service is operating and make changes, if necessary</td>
<td>A2  include additional information, in your documentation, such as a response times, which will help you to evaluate the service</td>
</tr>
<tr>
<td>• three different hardware faults</td>
<td>C3  include, in your problem log, detailed notes of the problems reported to you and how you solved them, to allow you to look back at similar problems at a later date</td>
<td>A3  compare the relative merits of on-line help facilities, manuals and user guides when giving advice to uses</td>
</tr>
<tr>
<td>• three different problems involving the operating system or user interface</td>
<td>C4  solve complex problems drawing together a range of skills</td>
<td>A4  use in-depth questioning to identify user problems and record your notes in your log</td>
</tr>
<tr>
<td>• two requests which required you to install software</td>
<td>C5  use technical language correctly, in your problem log to describe how you solved the problem</td>
<td>A5  demonstrate that you have drawn on your own experience as a user when producing a user guide that meets the needs of the audience.</td>
</tr>
<tr>
<td>• two requests which required you to change the settings within the software</td>
<td>C6  produce a detailed user guide, test your user guide on several users and revise it according to comments made</td>
<td></td>
</tr>
<tr>
<td>• three other different software problems</td>
<td>C7  select and use other resources of technical help, for example manufacturer’s web pages.</td>
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</tr>
<tr>
<td>E3  solve and give brief details of how you solved the problems by:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• giving the user advice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• your own actions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• referring the user to someone else</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E4  prioritise problems and keep users informed of progress</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E5  produce a user guide giving the basic steps needed to allow the user to carry out a task</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E6  test your user guide by asking one person to use it and note their comments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E7  select and use manuals and user guides to find the information you need to solve user's problems and find relevant information.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
18.4 Essential Information for Teachers

Guidance on delivery

In this unit students will draw on the knowledge and skills gained in others units. They will use their experience in a range of software applications and also the experience they gained in setting up and configuring systems in the Unit 4: System Installation and Configuration. This unit concentrates on the procedures involved in providing user support and the skills the student needs to develop in providing such support.

Students will need help in developing a strategy to identify problems. They need to be able to recognise the cause of a problem; whether it is due to the user’s lack of knowledge or to some problem with hardware or software. They will need to learn how to use questioning techniques and how to record the results of discussions with users.

The student needs to provide an appropriate solution such as providing a user guide, giving a demonstration or correcting a hardware fault, as appropriate. They may need to access manuals and user guides to assist in solving problems they encounter.

Students are required to provide simple user guides. These could be on paper or help files in the computer. They could cover a simple activity for new users or provide help for a problem which arises frequently.

Where possible, students should be given the opportunity to provide support to users in a real situation, perhaps by setting up and running a help desk for other students or staff. If this is not possible then tutors will have to simulate the situation. The students should cover a wide range of problems and use a range of techniques for solving problems. If these do not arise naturally it may be necessary to simulate some additional problems to ensure a broad coverage.

Students will need to realise that, although there are many users’ problems that they will be able to deal with effectively, there will be others which require more advanced knowledge or skills. In these cases the student should refer the problem to some other appropriate person.

All students should be able to solve a variety of problems and should have sufficient experience to satisfy the criteria for solving problems by your own actions by giving the user advice, or by referring the user to someone else. Candidates who wish to gain an E grade will be expected to solve straightforward problems only. C grade candidates should be able to solve complex problems, which involve drawing on a variety of skills and knowledge. A grade candidates should be able to solve a wide range of different problems showing initiative in their solutions.
The result of your assessment of candidate evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification which in turn is used to generate a qualification grade. The mark you award must take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark you determine for a particular student is based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements you should consider the following general qualities that distinguish between the grades:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.

**Grade E**

To achieve an E, the evidence should provide coverage of all requirements stated in the E grade criteria in the assessment grid. It may be however that a student has demonstrated considerable effort and skill in some areas at the expense of precise details in another. Professional judgement should be used to decide what is a reasonable expectation of the student and whether the stated quality and sufficiency requirements have, on balance, been met.

Candidates must be able to show the user support system they have produced and explain it in some detail. The documentation must show clearly the problems they have worked on, the users who had the problems and the solutions they proposed. The logs must show a variety of different types of problem and solutions.

Candidates must produce a user guide to address a problem they have encountered. Candidates must give details of the aim of the guide and the intended audience and write in a way that matches that audience.

Candidates should produce documentation to provide evidence of their activities, e.g., annotated screen prints and printouts. Tutor observation only is not sufficient.

To achieve an E grade, candidates must solve simple problems but must cover the range of problems in the criteria.

**Grade C**

To achieve a C grade the candidates must achieve all the grade E criteria and all the grade C criteria.

Candidates must be able to plan the user support service and decide what documentation will be needed. They must then produce the documentation and set up the service. During the running of the service they should have in place some monitoring of the service, so that if it becomes necessary to make adjustments to the service they can do so.
A C grade candidate should be able to produce a detailed log of problems using technical language appropriately. If a problem should arise for the second time they should be able to refer back to the log and use these as a resource.

Candidates will be able to solve complex problems involving more than one simple factor. They should record any discussion with the user including questioning techniques and responses and the action taken to solve the problem. If monitoring of the problem is required then this should be logged.

Candidates will be able to produce a user guide which addresses a known problem. They will identify the problem and the likely users of the guide. The guide should give precise instructions or information regarding its subject.

**Grade A**

To achieve an A grade candidates must achieve all the assessment criteria.

They should be able to critically analyse their support service and provide an evaluation, incorporating any improvements that could be made.

The documentation should be detailed and give evidence of good questioning technique of users of varying skill level and with a variety of problems. Candidates should record details of questioning and responses in the log of the service. Any follow-up conversations or monitoring activities should also be recorded, including any details which would be useful in improving the service provided.

An A grade candidate should be able to evaluate sources of information for providing help to users in the light of their experience. These include on-line help facilities, manuals and user guides. They should be able to consider the benefits of these resources for inexperienced users, regular users of ICT systems and for different problems they have encountered.

Candidates should be able to draw on their own experiences when they produce a user guide. Their testing and evaluation of the guide should indicate how they have used their personal experience.

**18.5 Resources**

Students must have the facility to install and configure software and the opportunity to provide user support.

**18.6 Key Skills Guidance**

This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

**Keys to attainment**

These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.
Signposts

These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Students will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.

18.7 Communication Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They will have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• testing the user guide by asking someone to use it and noting their comments</td>
<td>C3.1a Contribute to a group discussion about a complex subject.</td>
</tr>
<tr>
<td>• producing a user guide and user support documentation</td>
<td>C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image.</td>
</tr>
</tbody>
</table>

Signposts

If students are: There may be opportunities for them to develop the following Key Skills evidence:

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• solving and giving a brief details of how you solved the problems</td>
<td>C3.1b Make a presentation about a complex subject, using at least one image to illustrate complex points.</td>
</tr>
<tr>
<td>• Selecting and using manuals and user guides</td>
<td>C3.2 Select and synthesise information from two extended documents about a complex subject. One of these documents should include at least one image.</td>
</tr>
</tbody>
</table>

18.8 Working with Others

Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They will have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Asking a person to test your user guide, solving user’s problems</td>
<td>WO3.1 Plan complex work with others, agreeing objectives, responsibilities and working arrangements.</td>
</tr>
<tr>
<td></td>
<td>WO3.2 Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives.</td>
</tr>
<tr>
<td></td>
<td>WO3.3 Review work with others and agree ways of improving collaborative work in the future.</td>
</tr>
</tbody>
</table>
### 18.9 Improving Own Learning and Performance Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• selecting and using manuals and user guides</td>
<td>LP3.1 Agree targets and plan how these will be met over an extended period of time, using support from appropriate people.</td>
</tr>
<tr>
<td>• designing and completing user support documentation</td>
<td>LP3.2 Take responsibility for their learning by using their plan, and seeking feedback and support from relevant sources, to help meet targets.</td>
</tr>
<tr>
<td></td>
<td>LP3.3 Review progress on two occasions and establish evidence of achievements, including how they have used learning from other tasks to meet new demands.</td>
</tr>
</tbody>
</table>

### 18.10 Problem solving Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• setting up and running a user support service</td>
<td>PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward.</td>
</tr>
<tr>
<td></td>
<td>PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach as necessary</td>
</tr>
<tr>
<td></td>
<td>PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving.</td>
</tr>
</tbody>
</table>
19.1 About this Unit

This unit helps you:

- to develop your own ICT skills and use them to train others to use ICT
- to gain an introduction to training skills in order to progress towards training/teaching qualifications.

In this unit you will:

- be responsible for making all arrangements for a training session
- gather information on the attendees
- design and deliver a training session
- prepare and present training materials
- design and gather feedback.

This unit builds on both Advanced Unit 1: Presenting Information. This unit has links with Advanced Units 8: Interactive Multimedia Presentations and 14: ICT Solutions for People with Individual Needs.

This unit is ideal if you plan to pursue a career in the growth area of ICT training provision.

This unit is assessed through your portfolio work. The grade on that assessment will be your grade for the unit.

19.2 What You Need to Learn

For this unit, the topics you will learn about are:

- preparing facilities for a training course
- deciding course objectives
- computer based training (CBT)
- security procedures and health and safety issues
- training techniques
- course design
- evaluation.

Preparing facilities for a training course

Before you can prepare for a training course, you must know what facilities may be available and you must understand:

- your responsibilities and the responsibilities of others
- the system(s) set up, and the hardware and software set up
- any technical support you might be given.
You must be able to control the training environment to suit your clients’ needs:

- arranging the training room layout, e.g. equipment, PCs, tables
- copying files/discs and supplying all necessary materials
- maintaining health and safety in the training room.

You must be able to understand the requirements for conducting a training session in both a familiar and unfamiliar location, understanding the advantages and disadvantages of these venues, both to you and the trainees.

Deciding course objectives

You must be able to:

- gather information about the ICT training needs of your clients
- relate their aims/objectives to the content of your training session.

You must be aware of any member of the client group requiring special attention:

- those with limited mobility
- those who are visually impaired
- those who are hearing impaired.

Computer-based training (CBT)

You must:

- have a good understanding of CBT and what it can allow participants to achieve
- be able to evaluate a CBT package and make judgements on its suitability for the chosen session
- know of the Internet and how this can be used as a training tool for remote course delivery, including use of e-mail and conferencing.

Security procedures and health and safety issues

You must know how to follow data security procedures for equipment and files, including:

- use of passwords, levels of access and maintaining confidentiality
- source document storage and storage methods
- taking backups.

When delivering a training session you must be aware of current legislation affecting ICT and understand your personal responsibilities:

- software licensing
- Computer Misuse Act (1990)
- Health & Safety at Work Act (1974)
You must have a good understanding of the procedures for:

- removing hazards
- minimising risks
- fire and evacuation procedures
- first aid and dealing with other emergencies.

**Training techniques**

You must know how to adapt both your material and approach to present training sessions to different client groups, including:

- group theory session, group participation and team work, small syndicate group work
- demonstrations, Q & A sessions and one-to-one coaching/mentoring
- distance learning, open learning and CBT and the trainer’s role.

You must be able to adapt your training techniques to meet the needs of the client(s):

- avoiding technical jargon
- using body language appropriately
- actively listening and handling conflict.

You must have a good knowledge of the different types of resources available to aid presentations, and their advantages and disadvantages, including:

- blackboard and whiteboard, flipcharts and handouts
- OHPs and OHTs
- electronic methods, e.g. LCD projector.

You must be able to communicate effectively at all levels, both orally and in writing, with your peers, with those older than you, and with those younger than you.

**Course design**

You must be able to create plans to show the structure of the training session, including:

- session content in terms of aims and objectives
- resources required, costs and timing involved
- domestic arrangements, e.g. health and safety, first aid, toilets.

You must be able to prepare materials for use during the training session:

- handouts, including text, diagrams and OHTs
- technical and occupational manuals
- exercises, e.g. bought in, adapted, self designed
- discs and files.
In particular you must be able to design and prepare a training manual that the participants can use during the session and keep for later reference. In your manual, you must:

- reflect the content of the training session and cover the intended course objectives
- offer an easy-to-use guide for the client
- include an appropriately designed cover, a contents list, learning and descriptive material, exercises relevant for the topic and lists or details of further learning resources
- aim for simplicity of presentation, maximum visual impact and minimum use of technical jargon.

**Evaluation**

You must be able to design an evaluation form to measure the effectiveness of your course. You must ask for feedback on:

- trainer style, clarity of presentation and whether objectives were covered
- training session content and materials supplied
- domestic arrangements, and the quality of venue/facilities
- difficulties experienced by the participant.

**Standard ways of working**

**Note:** See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You must learn to:

- edit and save work regularly, using appropriate names for your documents
- store your work where you and others can easily find it
- keep dated backup copies of files on another disk and in another location
- keep a log of ICT problems you met and how you solved them
- protect confidentiality and observe copyright laws
- avoid bad posture, physical stress, eye strain and hazards from workplace layout.
You must produce records of an ICT training session, designed and delivered by you to a group of people. These records must include:

- a description of the training environment
- the training session plans
- materials used by you, including the training manual
- an evaluation of the training session.

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1 identify the aims of the training session and who the intended audience is</td>
<td>C1 prepare a detailed plan to show appropriate timescales for the training session, documenting changes to your plan where necessary</td>
<td>A1 demonstrate a high level of understanding, through an innovative training session, which is well structured and delivered with clarity</td>
</tr>
<tr>
<td>E2 identify and use training techniques to meet the requirements of the audience and the training session, taking into consideration any member requiring special attention.</td>
<td>C2 make effective use of the time given to present a clear and coherent training session</td>
<td>A2 evaluate the training materials for content, ease of use and visual impact, explaining your reasons for layout and design</td>
</tr>
<tr>
<td>E3 produce a description of the training environment including a diagram of room layout with relevant positioning of equipment and trainees</td>
<td>C3 deliver the training session effectively, supported by material presented in a logical and well-structured format</td>
<td>A3 use a comprehensive range of resources in your training session, which fully meet the needs of the group trained</td>
</tr>
<tr>
<td>E4 identify suitable hardware and software and specify technical support required</td>
<td>C4 take initiative for elements of technical support, and cope with technical enquiries from the group you are training</td>
<td>A4 produce a constructive evaluation of the training session, indicating areas of satisfaction, suggestions for improvement and recommendations for the development, delivery and evaluation of future training sessions</td>
</tr>
<tr>
<td>E5 produce materials and documentation, from a variety of sources, for a training session</td>
<td>C5 include existing materials edited for use by your group in your training materials.</td>
<td></td>
</tr>
</tbody>
</table>
19.4 Essential Information for Teachers

Guidance on delivery

This unit builds upon all the techniques learnt in Unit 1 and may also be linked with Unit 8 and/or Unit 12.

It is advisable to forge links with other groups within a school, outside training organisations, the voluntary sector, or other areas within a college environment to allow as many individual sessions as possible to occur. The subject matter of the ICT training session, which must to be delivered by the individual, should be new to the group.

In preparation for the delivery of an ICT training session, the student is expected to carry out research on different training techniques in order to decide which to use for the intended audience. The information gathered will form the basis of the short report, or notes to show an understanding of how different training techniques may be used with different client groups in both familiar and unfamiliar locations. The report should allow the student to demonstrate:

- an understanding of data security procedures within the organisation where training occurs
- good understanding of different methods of delivery
- the ability to evaluate a CBT package and show where CBT can be successfully used.

The report can be used to supplement the training session, by covering areas such as the use of passwords and level of access, which may have been inappropriate within the choice of training session.

To gain experience some students may spend a period of time in a different setting, either in school or at a different organisation, assisting in group activities and observing delivery. Some could research the courses offered on the Internet. (Open University may be one source). Appropriate CBT packages should be made available so that they can understand where these may be used to advantage. These groups could deliver their findings to their peers, as preparation towards their individual session.

Preparation for the delivery is of key importance here. The student will assume overall responsibility for both the delivery and the control of the group. Observational assessment will benefit the process.

The student should prepare for the training session, by identifying the audience, ensuring the venue is equipped with sufficient suitable computers, materials and software for the group.

Materials may be wholly designed and produced by the individual, but may also consist of materials already produced. In the latter instance, the student is expected to justify the use of existing material, identify where the material has originated from and supplement its use with individual input as, for example, an introduction or as additional exercises.
The student must also produce an evaluation form for the participants to complete, at the end of the training session.

The methods of delivery must be justified by the student, and may consist of:

- A Powerpoint presentation, developed by the individual and projected by LCD enabling the student to demonstrate their ability to use presentation aids.

- Computer-based training, as part of the training session, although care must be taken here to ensure the student has overall responsibility and control of the session. It will not be sufficient for the group to solely follow instructions on screen.

It may be appropriate to build up to the training session, with short presentations being arranged within groups, in order to practice their skills, and share the findings of their research.

Students should not be penalised for any nervousness shown on the day, but should be encouraged to identify where any weaknesses may have occurred. They should be given the opportunity to practice the skill.

Guidance on assessment

The result of your assessment of candidate evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification which in turn is used to generate a qualification grade.

The mark you award must take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark you determine for a particular student is based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements you should consider the following general qualities that distinguish between the grades:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.

Grade E

To achieve an E grade, the candidate should aim to provide evidence that covers all the requirements stated in the E grade assessment grid. It may be however that the candidate has demonstrated considerable effort and skill in some areas at the expense of precise detail in another. Professional judgement should be used to decide what is a reasonable expectation of the student and whether the stated quality and sufficiency requirements have, on balance been met.

Candidates must prepare, produce and deliver at least one training session to a group of people. The training session must be real, in that the subject will be new to the participants and the responsibility of timing, resources and control of the group is that of the candidate.
The training manual produced by the candidate must be easy to follow, clearly written in an appropriate style to suit the intended users.

The report must show that the candidate has a good understanding of how to adapt both material and approach to cater for different client group, including those listed. Consideration of other methods of presentations must include the advantages and disadvantages for each.

**Grade C**
To achieve a C grade the candidate must include a detailed plan of the training session, to include the start and finish times as well as appropriate intermediate timings. The description of the venue should include the resources available and a background of the intended audience, to include details of any members requiring special requirements.

It is expected that the candidate will make arrangements for technical support to be available or on call.

The training manual must be clearly produced, in a logical and well structured manner.

The training session should allow the candidate to demonstrate effective use of presentation skills, both orally and visually.

**Grade A**
To achieve an A grade, candidates’ evaluations will be quite comprehensive and will contain appropriate and fluent technical language. The evaluation will include, comments on the timings, identify good and bad qualities within the session and suggest improvements for future training sessions.

Candidates will show, in the delivery of the training session that they are capable of using a variety of resources, for example, pre-prepared disks, CBT, video and OHTs. The training manual will be of a high standard, showing that the candidate has appropriately used skills obtained from Unit 1.

### 19.5 Resources
Students must have the opportunity to train others.

### 19.6 Key Skills Guidance
This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

**Keys to attainment**
These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.
Signposts
These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Students will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.

19.7 Communication Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• delivering your training session to your audience</td>
<td>C3.1b Make a presentation about a complex subject, using at least one image to illustrate complex points.</td>
</tr>
<tr>
<td>• producing the training materials for use in the training session</td>
<td>C3.3 Write two different types of document about complex subjects. One piece of writing should be an extended document and include at least one image.</td>
</tr>
</tbody>
</table>

Signposts
If students are: There may be opportunities for them to develop the following Key Skills evidence:

<table>
<thead>
<tr>
<th>If students are:</th>
<th>C3.2 Select and synthesise information from two extended documents about a complex subject. One of these documents should include at least one image.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• identifying training techniques, hardware, software and technical support</td>
<td></td>
</tr>
</tbody>
</table>

19.8 Application of Number Level 3

Signposts
If students are: There may be opportunities for them to develop the following Key Skills evidence:

<table>
<thead>
<tr>
<th>If students are:</th>
<th>N3.1 Plan, and interpret information from two different types of sources, including a large data set.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• drawing a diagram of the room layout</td>
<td>N3.2 Undertake multi-stage calculations to do with:</td>
</tr>
<tr>
<td></td>
<td>a amounts and sizes;</td>
</tr>
<tr>
<td></td>
<td>b scales and proportion.</td>
</tr>
<tr>
<td></td>
<td>They should work with a large data set on at least one occasion.</td>
</tr>
<tr>
<td></td>
<td>N3.3 Interpret results of their calculations, present their findings and justify their methods. They must use at least one graph, one chart and one diagram.</td>
</tr>
</tbody>
</table>
19.9 Working with Others
Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They will have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• deliver a training session to a group of people</td>
<td>WO3.1 Plan complex work with others, agreeing objectives, responsibilities and working arrangements. WO3.2 Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives. WO3.3 Review work with others and agree ways of improving collaborative work in the future.</td>
</tr>
</tbody>
</table>

19.10 Improving Own Learning and Performance Level 3

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• using feedback from training session participants, evaluating the session</td>
<td>LP3.1 Agree targets and plan how these will be met over an extended period of time, using support from appropriate people. LP3.2 Take responsibility for their learning by using their plan, and seeking feedback and support from relevant sources, to help meet targets. LP3.3 Review progress on two occasions and establish evidence of achievements, including how they have used learning from two other tasks to meet new demands.</td>
</tr>
</tbody>
</table>

19.11 Problem Solving Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They will have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• designing and delivering an ICT training session</td>
<td>PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach as necessary.</td>
</tr>
</tbody>
</table>
Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• designing and delivering an ICT training session</td>
<td>PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward.</td>
</tr>
<tr>
<td></td>
<td>PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving.</td>
</tr>
</tbody>
</table>
Advanced VCE Unit 14
ICT Solutions for People with Individual Needs

20.1 About this Unit

This unit helps you:

- to understand the development of ICT, both the software and hardware, dedicated to people with individual needs
- to assess whether this equipment has improved quality of life for users with individual needs
- to explore future developments of ICT hardware and software, focusing on supporting users with individual needs

In this unit, you will:

- explore why there is a need for dedicated equipment and discover what special equipment is available
- use investigative methods to evaluate the importance of such equipment
- match hardware and software available to users with particular impairments
- consider issues relating to relevant legislation

This unit links with Advanced Unit 15: Impact of ICT on Society. It also has close links with Advanced Unit 4: Systems Installation and Configuration, as you will explore specific user requirements in terms of hardware and software.

This unit may prove useful if you are looking to further your development in the caring field, using your ICT skills.

This unit is assessed through your portfolio work. The grade on that assessment will be your grade for the unit.

20.2 What You Need to Learn

For this unit, the topics you will learn about are:

- types of impairment
- provisions currently available for users with individual needs
- areas for development of new products
- aspects of legislation.
You must know about the many types of impairment and what difficulties a user with impairment will have in using a normal ICT system.

You must learn about those impairments related to three of the five senses of sight, hearing, speech, touch and smell:

- sensory impairment
- limited mobility
- language disability.

You must also learn about impairments which result from illness or accident, or may be hereditary, and may affect learning, including:

- lack of motor control or dexterity
- having limited use of limbs
- lack of spatial awareness
- short attention span
- language difficulty
- dyslexia.

You must be able to identify what special facilities may support the user with individual needs to make full use of ICT facilities, and be able to match the facility to the impairment.

You must:

- know where to obtain background information on people with individual needs, e.g. books, exhibitions, organisations
- know how to obtain national statistics which show the number of people affected by impairment
- be able to analyse this information, and to present it in the form of a report which illustrates differences in individual needs.

You must be able to present your recommendations for an ICT solution in a way that:

- recognises the impairment of the person with individual needs
- takes into account that the user may not understand technical ICT terminology
- is of a professional standard, i.e. well presented in a user-friendly way and free of error.
Provisions currently available

You must know about hardware currently available and what facilities they offer to people with individual needs, including:

• flashing lights on headsets to replace bells
• incoming speech amplifiers and induction loops
• videophones
• speech synthesisers
• special monitors (touch screens)
• mobile telephones and telephones with inductive couplers
• text pay telephones and fax machines.

You must know about available software, and what special features are incorporated to help people with the individual needs, including:

• typetalk (relay service for the deaf)
• TED (Telephone Exchange for the Deaf)
• voice recognition techniques
• environmental control systems
• the Internet
• Success Maker
• educational applications software.

You must know how media is adapted to suit people with individual needs, including the provision of:

• enlarged telephone dial rings
• colour contrasting
• reports on audio tape
• bills produced in large print/braille
• bills read to customers over the telephone
• notched telephone cards.

You must know how to:

• scan documents and automatically undertake OCR
• read on OCR or any other text file, converting it into speech output
• enable control of the cursor during speech output to locate position in text file
• allow text file editing
• provide speech feedback for any given key depression.
Areas for development of new products

Further developments in ICT may have a great impact upon many people with individual needs.

You must know about recent developments and be able to think of areas for further development to support users with individual needs, including:

- sending discs of information to users who have computers
- sending discs for users who have voice capabilities
- MOBIC (mobility of blind and elderly people interacting with computers)
- eye-to-eye (through the screen video conference technique)
- gesture recognition (computer understands ‘talk’ in sign language)
- cyber speech (text turned into speech and lip movement)
- expert advice (headset-mounted video conference system)
- new pay telephones
- virtual reality
- multimedia terminal equipment
- video commands.

You must be able to match appropriate equipment and software to users with a particular impairment.

Aspects of legislation

You must be aware of relevant legislation, including:

- Chronically Sick and Disabled Persons’ Act (CSDPA) (1970)
- Disability Discrimination Act (DDA) (1995)
- Telecommunications Act (1984)
- Equal Opportunities policies.

Standard ways of working

Note: See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You must learn to:

- edit and save work regularly, using appropriate names for your documents
- store your work where you and others can easily find it
- keep dated backup copies of files on another disk and in another location
- keep a log of ICT problems you met and how you solved them
- protect confidentiality and observe copyright laws
- avoid bad posture, physical stress, eye strain and hazards from workplace layout.
You must produce an investigation into ICT solutions for people for individual needs, including:

- a report on a numerical analysis of the number of people with individual needs
- a recommendation for ICT solutions which match the needs of three users who have the following impairments:
  - sensory impairment
  - limited mobility
  - language disability
- a presentation evaluating the limitations of the current provision and recommending future developments in ICT to meet the requirements of users with individual needs.

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1  collect national statistics relating to the number of people with individual needs and present this information in the form of a report which identifies the differences between individual needs</td>
<td>C1  plan your investigation into impairments and possible hardware and software to meet the needs of people with individual needs, and monitor your progress, changing your plan if necessary</td>
<td>A1  evaluate the strengths and weaknesses of your planning and make recommendations for improvement</td>
</tr>
<tr>
<td>E2  collect information on available hardware and software products which may meet the needs of your three users</td>
<td>C2  explain how you collected your national statistics and how you put your analysis report together</td>
<td>A2  reach conclusions about the numbers of people with individual needs, ensuring that your report is well structured, free from error and presented in a professional manner</td>
</tr>
<tr>
<td>E3  identify ICT solutions for each of the three users, listing suitable equipment for use by each of them and alternative equipment available</td>
<td>C3  include in your report, national percentages of the population who have a range of individual needs</td>
<td>A3  include in your recommendations to each user, a discussion of the potential limitations of your proposed ICT solution in relation to budgets available, giving consideration to realistic and idealistic aims and objectives</td>
</tr>
<tr>
<td>E4  present your recommendations, choosing a suitable formal style of presentation and presenting your information in a way which is easy for the people with individual needs to follow.</td>
<td>C4  verify your information sources, both for the report and your ICT solutions, showing that you have used a wide variety of sources</td>
<td>A4  analyse the strengths and weaknesses of the suggestions for ICT solutions that you have made</td>
</tr>
<tr>
<td></td>
<td>C5  explain your reasons for your choice of equipment in each ICT solution and show how your knowledge, skills and understanding of the development of specialised equipment has led you to your conclusions.</td>
<td>A5  evaluate the impact that hardware and software designed for use by people with individual needs may have on society in the future.</td>
</tr>
<tr>
<td></td>
<td>C6  produce well presented accurate information in your recommendations of ICT solutions for each user</td>
<td></td>
</tr>
</tbody>
</table>
20.4 Essential Information for Teachers

Guidance on Delivery

Developments in ICT have had a great impact upon many people with individual needs. Students should be encouraged first of all to investigate different types of impairment, without going too deeply into the medical causes, but rather concentrating on how individuals are affected and on the particular difficulties facing an ICT user with an impairment.

Students should be encouraged to use a range of sources as they investigate impairment and the special facilities that exist to support users with individual needs. For example many of the examples of hardware, software and media given in the unit can be seen at exhibitions or through videos supplied by the producers of the goods. Most students will plan a research strategy which allows for the inevitable ‘dead ends’ that they may encounter and will know when to pursue an avenue of enquiry and when to call it a day.

Students should also be encouraged where possible to involve people with individual needs in their work on this unit. A centre that has links with a special school may be ideal for this.

Disability in the context of education in terms of differentiation could include software application packages for mixed ability teaching. This would be ideal for students who had not had the opportunity to see specialised ICT equipment for people with individual needs. The centre’s own special needs department may provide an interesting starting point for the students to learn about particular types of impairment and to observe, try out and learn about ICT-based facilities. Students should understand and see the equipment and software in use and assess its limitations, suggesting alternatives. However, students should not be allowed to lose sight of the three areas of impairment that form the foci of the assessment evidence – they may not be able to find all the necessary evidence in a mainstream school.

Language impairment may be given a broad interpretation to include low levels of literacy and numeracy, and may include temporary impairment such as that faced by students for whom English is a second language. There is an increasing range of ICT solutions emerging for this area.

Evidence of this research may be enhanced if students have access to a digital camera or a scanner or video capture equipment.

Students may recognise general disabilities and common perceptions of those disabilities. This unit will give the student an opportunity to gain an appreciation of the detail and effects of a wider variety of individual needs.
The Internet provides a wealth of material to help students with both the investigation of types of impairment and with the range of ICT-based solutions on offer. Examples of some possible starting points are given below (this is in no way an exhaustive list).

<table>
<thead>
<tr>
<th>British Deaf Association</th>
<th>General Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://www.bda.org.uk">www.bda.org.uk</a></td>
<td><a href="http://www.hood.edu/seri/serihome.htm">www.hood.edu/seri/serihome.htm</a></td>
</tr>
<tr>
<td>NAIDEX</td>
<td>Assistive technology</td>
</tr>
<tr>
<td><a href="http://www.naidex.co.uk">www.naidex.co.uk</a></td>
<td><a href="http://www.at-center.com/windows.htm">www.at-center.com/windows.htm</a></td>
</tr>
<tr>
<td>Spina Bifida and Hydrocephalus</td>
<td>BT Equipment and Services</td>
</tr>
<tr>
<td><a href="http://www.spinabifida.net">www.spinabifida.net</a></td>
<td><a href="http://www.bt.com/World/community/aged">www.bt.com/World/community/aged</a> and disabled/</td>
</tr>
<tr>
<td></td>
<td>mindex/maindex.htm</td>
</tr>
<tr>
<td>Muscular Dystrophy Association</td>
<td>IBM resources</td>
</tr>
</tbody>
</table>

The list of legislative requirements should be updated to reflect any changes and/or additions to the law relating to special needs.

British Telecom offer some exceptionally good publications with regards to highlighting the needs of users with individual needs. The book, which is free on request, called *Putting Disability on the Agenda* provides extensive information that would complement the unit. Another good publication is *The BT Guide to Equipment and Services for Disabled Customers*. Information may also be found in “Social Trends,” published annually by HMSO.

Any presentation may be written or verbal, or it may make use of multimedia presentation software (linking with Unit 8) as appropriate to the situation.

Students who are aiming for higher grades, would be expected to demonstrate understanding that derives from sustained real-life contact with those who experience impairment both in their analyses of problems faced and the solutions they propose.

Group work may be an effective way of investigating a range of sources of evidence. There should be no problem about authenticity if each student is asked to make notes on a sample of the group’s findings. When linked to presentational techniques, research for this unit should help students to write and present their work clearly, succinctly and effectively.

**Guidance on assessment**

The result of your assessment of student evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification, which in turn is used to generate a qualification grade.
The mark you award must take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark you determine for a particular candidate is based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements you should consider the following general qualities that distinguish between the grades:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.

**Grade E**

To achieve an E grade, candidates should aim to provide evidence that covers all the requirements stated in the E grade criteria of the assessment grid. It may be however that a candidate demonstrates considerable effort and skill in some areas at the expense of precise detail in another. Professional judgement should be used to decide what is a reasonable expectation of students and whether the stated quality and sufficiency requirements have, on balance, been met.

The national statistics collected should relate to the three designated areas of impairment. The analysis of the statistics should make use of charting features of common spreadsheet and database software.

The research into hardware and software should be supported by evidence showing the type of equipment and a simple explanation of its features and how it functions.

The three recommended ICT solutions will have to address specific individual needs and will therefore have to include a clear description of the needs of the individual and will show an understanding of how a person with such impairment is affected.

Reports should be accurate in technical content, spelling and grammar.

The report will be accessible to a person with the individual needs. It may take the form of a visual presentation, with audio prompts and it may be possible to make it voice activated.

**Grade C**

To achieve a C grade the evidence will cover all the requirements stated in the E and C grade criteria in the assessment grid.

Initial research into impairment will extend beyond the three areas designated, but detail presented will focus on the three areas.

The candidate will show evidence of careful planning by including outline plans showing possible sources to be investigated and the results of the investigations.
There will be clear evidence that a variety of sources has been used – these may include the Internet, books and magazines, and will preferably include live data gathered from interviews and observations.

A detailed record of sources should be included.

Recommendations should be supported by clear explanations of the expected benefits to the individual with impairment.

The candidate should show a degree of understanding of the individual needs of each person for whom a recommendation is made.

**Grade A** To achieve an A grade the evidence will cover all the requirements stated in the E, C and A grade criteria in the assessment grid.

Candidates should make detailed qualitative evaluation of each section of the work outlining the strengths and weaknesses of the approach, the planning and the outcomes.

Candidates should analyse all the recommendations that are made against several criteria – such as practicality, affordability and ease of implementation. They should make an estimate of how the recommendations will improve the quality of life for the individual with impairment. They should invite and record comment, if possible, from individuals with impairment, or those who care for them, at all stages and show how this has informed their proposed ICT solutions.

Candidates should demonstrate understanding and empathy both in their analyses and proposed solutions.

All presentations should be as professional as possible, should be accessible to all, and should show knowledge, understanding and a measure of empathy, without being patronising.

### 20.5 Key Skills Guidance

This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

**Keys to attainment**

These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.

**Signposts**

These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Students will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.
20.6 Communication Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• presenting an evaluation of the limitations of current provision</td>
<td>C3.1b Make a presentation about a complex subject, using at least one image to illustrate complex points.</td>
</tr>
<tr>
<td>• producing a report on a numerical analysis of the number of people with individual needs</td>
<td>C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image.</td>
</tr>
</tbody>
</table>

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• collecting information on hardware and software products, and national statistics</td>
<td>C3.2 Select and synthesise information from two extended documents about a complex subject. One of these documents should include at least one image.</td>
</tr>
</tbody>
</table>

20.7 Application of Number Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They should have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• carrying out analysis of needs of provision for people with individual needs</td>
<td>N3.1 Plan, and interpret information from two different types of sources, including a large data set.</td>
</tr>
<tr>
<td></td>
<td>N3.2 Undertake multi-stage calculations to do with:</td>
</tr>
<tr>
<td></td>
<td>c handling statistics.</td>
</tr>
<tr>
<td></td>
<td>They should work with a large data set on at least one occasion</td>
</tr>
<tr>
<td></td>
<td>N3.3 Interpret results of their calculations, present their findings and justify their methods. They must use at least one graph, one chart and one diagram.</td>
</tr>
</tbody>
</table>
20.8 Working with Others
Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• investigating sensory impairment, limited mobility or language disabilities</td>
<td>WO3.1 Plan complex work with others, agreeing objectives, responsibilities and working arrangements.</td>
</tr>
<tr>
<td>• assessing effectiveness of ICT-based solutions</td>
<td>WO3.2 Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives.</td>
</tr>
<tr>
<td></td>
<td>WO3.3 Review work with others and agree ways of improving collaborative work in the future.</td>
</tr>
</tbody>
</table>

20.9 Improving Own Learning and Performance Level 3

**Signposts**

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• planning their investigation</td>
<td>LP3.1 Agree targets and plan how these will be met over an extended period of time, using support from appropriate people.</td>
</tr>
<tr>
<td>• preparing their presentation</td>
<td>LP3.2 Take responsibility for their learning by using their plan, and seeking feedback and support from relevant sources, to help meet targets.</td>
</tr>
<tr>
<td></td>
<td>LP3.3 Review progress on two occasions and establish evidence of achievements, including how they have used learning from other tasks to meet new demands.</td>
</tr>
</tbody>
</table>
## 20.10 Problem Solving Level 3

### Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• investigating sensory impairment, limited mobility or language disability</td>
<td>PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward.</td>
</tr>
<tr>
<td>• matching hardware and software available to users</td>
<td>PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach as necessary.</td>
</tr>
<tr>
<td></td>
<td>PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving.</td>
</tr>
</tbody>
</table>
Advanced VCE Unit 15
Impact of ICT on Society

21.1 About this Unit

This unit helps you to understand:

• the historical development of ICT
• the impact ICT has had on society
• legislation relating to ICT.

In this unit, you will:

• explore the effect ICT has had on methods of production and working practices
• use ICT to assess the social and economic implications ICT is having
• use investigative methods to evaluate the impact of ICT on the public service industry
• consider issues related to ICT and the environment
• consider the current uses of ICT, the progression of ICT and hence implications for the future.

This unit introduces new concepts that will require research and debate. It also has links with Units 2: ICT Serving Organisations and 14: ICT Solutions for People with Individual Needs.

This unit is assessed through your portfolio work. The grade on that assessment will be your grade for the unit.

21.2 What You Need to Learn

For this unit, the topics you will learn about are:

• development of ICT over the last two decades
• the “information society”
• the impact of ICT on working practices
• the impact of ICT on methods of production
• the effects of ICT on the environment
• legislation for ICT users
• the future use of ICT.
You must be able to comment on areas of development, including:

- component miniaturisation, e.g. microprocessors, laptops, and the double impact of reducing costs and improved quality of equipment
- communications equipment e.g. cabling, fibre optic links, telephones, microwave links, modems, networks, satellite
- the increased availability of information sources, including the Internet, and changes in input methods, e.g. from punched card/tape to magnetic strip readers
- improved resolutions, e.g. video, film, printed, multimedia and information compression
- the improvements in speed, e.g. of transmissions, of hardware functions, of software processing
- the constant need for retraining in ICT skills and the software development to meet this need.

History shows the move from the agricultural society, through the industrialised society and now to the information society. You must be able to assess to what extent society is better informed as a result of developments in ICT and give examples to support your rationale.

You must know about the facilities that are being improved through the use of ICT, including:

- touch screens, e.g. at tourist information sites
- automatic teller machines (ATMs) outside banks and in shopping arcades
- information boards, e.g. in motorway service stations and in railway stations
- on-screen help in different languages, e.g. in telephone boxes.

You must be able to identify the impact of the increased availability of information using ICT on a variety of public services, such as:

- information services, e.g. museums, libraries, directory enquiries
- emergency services, e.g. fire station, ambulance, coastguard
- the National Health Service
- education
- public transport.

You should also be able to identify how individuals and society are affected by changes in these public services.
The impact of ICT on working practices

You must understand how the introduction of ICT affects working practices. In particular, you must know how ICT has had an impact on:

- location and pattern
- on employer premises or at home
- allowing a 24-hour operation
- allowing personal flexibility
- being static in an office or mobile
- workskills e.g. keyboard, technical, design, analysis
- retraining.

You must understand how the effect of ICT on working practices has a knock-on effect on employees:

- social aspects
- changes in motivation for those no longer supervised directly
- risk of job loss due to changes in workskills required and number of staff needed
- security of work due to changing contractual arrangements between employers and employees
- reduced social interaction at work, but increased interaction with family and neighbours
- balance of responsibilities e.g. who is put under stress, who takes the blame when things go wrong
- changes in amounts and timing of leisure time
- the fast changing pace of ICT developments.

You must know how employers are affected by the stress caused by:

- changes in supervision, e.g. rates of pay, performance related pay (PRP)
- increased automation
- legal responsibilities e.g. security, privacy and health and safety etc.

The impact of ICT on methods of production

To see how ICT has affected methods of production, you must understand how introducing robotics and other linked ICT systems has improved the process of:

- robotics
- production control
- process control.
In particular, you must know how ICT has aided:

- the speed of the process
- the cost of the process
- the safety of the workers involved
- the quality of the final product.

You must then be able to recognise how this development in ICT has had, and may in the future have, an impact on society, including issues such as:

- health and safety
- employment levels
- working practices.

The introduction of ICT promised many things, including a paperless office and a global society. You must be able to decide whether these goals, and others, are achievable. In particular, you must be able to:

- identify other goals that ICT may help society to achieve
- make recommendations as to whether communications can be made without paper
- suggest working methods that would reduce the amount of paper used or kept
- identify what is meant by a global society and explain the benefits and drawbacks of such a society.

You must consider other effects that ICT may have on the environment, both positive and negative, including:

- changes in transportation needs
- use of scarce resources
- increased pollution and better control of pollution.

You must be aware of the following aspects of legislation which affect ICT users:


You must understand the reasons for the introduction of this legislation:

- to meet moral obligations to protect workers from harm and to minimise the effects of exposure to uncensored materials
- to provide legal backing so that it is possible to seek redress if rights are violated
• to protect the confidentiality of information kept about the individual
• to observe copyright for those who create original works.

You must know about threats to information kept on ICT systems, including:
• corruption and sabotage
• industrial espionage and theft.

You must know what measures might be taken to that these threats may be minimised.

You must understand who is affected by the legislation, what protection the legislation offers and what aspect of using ICT is affected, e.g:
• use of software
• misuse of data
• copying of copyright material
• effects of exposure to uncensored materials.

You must be aware of European Union (EU) regulations on the use of computers and the Internet Code of Practice.

The future use of ICT

You must explore the possible developments of ICT in the future and, in particular, assess the potential impact on topics such as:
• financial transactions, e.g. if smart cards are used for charging purposes
• shopping habits, e.g. if shopping via the World Wide Web increases
• personal safety and freedom, e.g. if geographical positioning systems (GPS) are used to track individuals, or ID cards are introduced
• commercial security, e.g. if security systems are developed to improve detection of theft, for example on networked computer systems.
Standard ways of working

Note: See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You need to learn to:

• edit and save work regularly, using appropriate names for your documents
• store your work where you and others can easily find it
• keep dated backup copies of files on another disk and in another location
• keep a log of ICT problems you met and how you solved them
• protect confidentiality and observe copyright laws
• avoid bad posture, physical stress, eye strain and hazards from workplace layout.
### 21.3 Assessment Evidence for Unit 15: Impact of ICT on Society

**You must produce** an investigation into the impact of ICT use on one aspect of society, including:

- notes on the past and present impact of ICT use on one aspect of society
- a record of a debate on the impact of ICT use on one aspect of society and your part in the debate
- a presentation on how ICT has aided at least three public services, including any legislative requirements
- a report on the possible uses of ICT in the future and what the implications on one aspect of society may be.

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1 carry out research on at least three different services to show how the public are better informed as a consequence of ICT and to identify how the use of ICT is changing</td>
</tr>
<tr>
<td>E2 provide evidence of how you collected and collated your information for use in the debate and your report, make notes to help your contribution to the debate, and summarise its main points</td>
</tr>
<tr>
<td>E3 summarise, in at least two areas, how methods of production have changed since the development and use of ICT</td>
</tr>
<tr>
<td>E4 make accurate notes which show a basic understanding of the effects ICT has had on the environment</td>
</tr>
<tr>
<td>E5 choose a suitable style of delivery and include accurate information for your presentation</td>
</tr>
<tr>
<td>E6 demonstrate in your presentation that you know the difference between types of legislation which affect the three services</td>
</tr>
<tr>
<td>E7 in your report, organise the information in a way that is easy to follow and identify how the use of ICT has changed, what impact ICT is having on society now and may have in the future.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To achieve a Grade C you must also show you can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 plan the way in which you will conduct your research, monitor your progress and change your plans if necessary</td>
</tr>
<tr>
<td>C2 use a wide variety of sources and select only relevant information for use in your presentation and report</td>
</tr>
<tr>
<td>C3 compare new systems to manual processes, explaining the differences between the working practices before and after the implementation of an ICT system</td>
</tr>
<tr>
<td>C4 identify the effects of ICT on the environment as positive or negative</td>
</tr>
<tr>
<td>C5 use a variety of different techniques which help you to illustrate the points to be made in your presentation</td>
</tr>
<tr>
<td>C6 draw together your knowledge, skills and understanding in your presentation</td>
</tr>
<tr>
<td>C7 consider, in your report, a variety of appropriate alternatives and show how your knowledge, skills and understanding of the development of ICT have led you to these conclusions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 analyse the strengths and weaknesses of your planning and make suggestions for possible improvements</td>
</tr>
<tr>
<td>A2 evaluate the sources that you have used for bias, reliability and relevance, and make sure that all information is accurate and supports your argument by quoting relevant facts and figures</td>
</tr>
<tr>
<td>A3 evaluate changes brought about by the implementation of ICT systems and conclude how beneficial they actually are and whether they have helped the people involved</td>
</tr>
<tr>
<td>A4 suggest actions which will minimise the negative effects of the impact of ICT on the environment</td>
</tr>
<tr>
<td>A5 consider alternative points of view without bias in the debate</td>
</tr>
<tr>
<td>A6 present your report in a professional manner and use a variety of techniques which help you to illustrate the points to be made</td>
</tr>
<tr>
<td>A7 demonstrate your breadth and depth of understanding of the unit by drawing on personal experiences to suggest how ICT may impact on the aspects of society you have studied.</td>
</tr>
</tbody>
</table>
21.4 Essential Information for Teachers

Guidance on delivery

The nature of information technology is constantly changing. It increasingly affects everyone’s lives in one way or another. In this unit, students should consider the wider implications and effects of ICT, both negative and positive. Teachers should endeavour to keep up to date with this constant change in terms of their resources for teaching and learning.

In considering the development of ICT, it may be helpful for students to speak to parents/relatives about the various incarnations of ICT in the home and at work. This unit offers great scope for ‘industrial’ visits, work placement, visiting speakers and the use of case study materials.

Investigation of the development of ICT within the college/school is also likely to be of benefit. Teachers’ experience of the first computers in education to the present day should be of interest to students working on this unit.

Numerous business websites provide information regarding the use of ICT & how this has changed/developed over recent years.

Teachers are advised to make use of the many newspaper and journal articles that link with the unit, many of which are available free of charge, on-line.

Students should be encouraged to consider the positive and negative effects of the increased use of ICT, particularly on the environment, individuals and business practices.

Students must be aware of the legislation affecting IT users – UK Government and the European Union publications and websites are a useful source of information here.

In terms of the future use of ICT, again, there is a wealth of articles that may be found on the Internet as well as paper-based.

The unit offers students the opportunity to develop their communication skills through the debate and presentation – the presentation could be linked to Unit 8: Interactive Multimedia Presentation, should students wish to present their finding via this medium.

Care should be taken to facilitate a well-structured debate on the impact of ICT.

Teachers should encourage students to make the links between this and other units, for example, Unit 2: Serving Organisations.

Guidance on assessment

The result of your assessment of student evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification which in turn is used to generate a qualification grade.
The mark you award must take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark you determine for a particular student is based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements you should consider the following general qualities that distinguish between the grades:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.

**Grade E**

To achieve an E grade, candidates should aim to provide evidence that covers all the requirements stated in the E grade criteria of the assessment grid. It may be however that a student demonstrates considerable effort and skill in some areas at the expense of precise detail in another. Professional judgement should be used to decide what is a reasonable expectation of students and whether the stated quality and sufficiency requirements have, on balance, been met.

Candidates must carry out research on at least three different services to show how the public are better informed as a consequence of ICT and to identify how the use of ICT is changing.

They should show evidence of how they collected and collated their information for use in the debate and report. Notes should be made to help their contribution to the debate and summarise the main points.

They should summarise, in at least two areas, how methods of production have changed since the development and use of ICT, making accurate notes which show a basic understanding of the effects ICT has had on the environment.

For their presentation, they should choose a suitable style of delivery and include accurate information showing that they know the difference between types of legislation which affect the three services.

In the report, they should organise the information in a way that is easy to follow and identify how the use of ICT has changed, what impact ICT is having on society now and may have in the future.

**Grade C**

In addition to the grade E criteria, candidates should demonstrate their further breadth of knowledge and understanding.

They should plan the way in which they will conduct their research, monitor their progress and change plans if necessary.

They should use a wide variety of sources and select relevant information for use in the presentation and report.
New systems should be compared to manual processes, explaining the differences between the working practices before and after the implementation of an ICT system and identify the effects of ICT on the environment as positive or negative.

Candidates should use of a variety of different techniques that help them to illustrate the points made in the presentation.

The presentation should show a synthesis of knowledge, skills and understanding.

The report should consider, a variety of appropriate alternatives and show how their knowledge, skills and understanding of the development of ICT have led them to these conclusions.

**Grade A** Candidates should demonstrate a thorough knowledge and understanding and show their breadth and depth of understanding of the unit by drawing on personal experiences to suggest how ICT may impact on the aspects of society they have studied.

The strengths and weaknesses of planning should be analysed and suggestions made for possible improvements.

The sources used should be evaluated for bias, reliability and relevance, confirming that all information is accurate and supports the arguments by quoting relevant facts and figures where appropriate.

Candidates should evaluate changes brought about by the implementation of ICT systems, identifying the benefits and whether they have helped the people involved.

They should suggest actions that will minimise the negative effects of the impact of ICT on the environment.

They should show, in the debate, an ability to consider alternative points of view without bias and present the report in a professional manner using a variety of techniques which help to illustrate the points to be made.

**21.5 Key Skills Guidance**

This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

**Keys to attainment**

These are identified Key Skills or aspects of Key Skills that are central to vocational agreement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.
Signposts

These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Students will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.

21.6 Communication Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They will have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• taking part in the debate on the impact of ICT</td>
<td>C3.1a Contribute to a group discussion about a complex subject.</td>
</tr>
<tr>
<td>• making a presentation on how ICT has aided at least three public services</td>
<td>C3.1b Make a presentation about a complex subject, using at least one image to illustrate complex points.</td>
</tr>
<tr>
<td>• writing a report on the possible uses of ICT in the future</td>
<td>C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image.</td>
</tr>
<tr>
<td>• recording a database</td>
<td></td>
</tr>
<tr>
<td>• producing a presentation</td>
<td></td>
</tr>
</tbody>
</table>

Signposts

If students are: There may be opportunities for them to develop the following Key Skills evidence:

| Collecting information for use in the debate                                    | C3.2 Select and synthesise information from two extended documents about a complex subject. One of these documents should include at least one image. |

21.7 Working with Others

Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They will have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• taking part in a debate on the impact of ICT on one aspect of society</td>
<td>WO3.1 Plan complex work with others, agreeing objectives, responsibilities and working arrangements.</td>
</tr>
<tr>
<td>WO3.2 Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives.</td>
<td></td>
</tr>
<tr>
<td>WO3.3 Review work with others and agree ways of improving collaborative work in the future.</td>
<td></td>
</tr>
</tbody>
</table>
### Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• collecting and collating information for use in the debate</td>
<td>LP3.1 Agree targets and plan how these will be met over an extended period of time, using support from appropriate people.</td>
</tr>
<tr>
<td>• investigating the impact of ICT on society</td>
<td>LP3.2 Take responsibility for their learning by using their plan, and seeking feedback and support from relevant sources, to help meet targets.</td>
</tr>
<tr>
<td></td>
<td>LP3.3 Review progress on two occasions and establish evidence of achievements, including how they have used learning from other tasks to meet new demands.</td>
</tr>
</tbody>
</table>
Advanced VCE Unit 16

Programming

22.1 About this Unit

This unit helps you to:

• identify problems that may be solved by programming
• agree user requirements and develop a program specification
• explore the use of a programming language to create customised software
• learn and apply the principles of program design
• design, implement and test a program to meet a given specification
• produce technical and user documentation
• develop good practice in your use of ICT

You will design, test and produce a working object-event based program or programs to meet stated user needs. You will learn about data types, data structures, program structures, module types, objects and events.

This unit builds on Advanced Unit 1: Presenting Information. It also links closely with Advanced Unit 3: Spreadsheet Design, which has many similar requirements.

This unit is assessed through your portfolio work. The grade on that assessment will be your grade for the unit.

22.2 What You Need to Learn

The topics are:

• program specification
• program design
• testing programs
• documentation
• standard ways of working.

Program specification

You need to learn how to identify and agree the problem with users, and decide how it may be solved to suit their requirements. You must learn how to break the problem down into manageable tasks. The first step is to discuss with the user:

• what output information they want
• how they currently obtain that information, if at all
• what data needs to be input to get the required output
• where the data to be input is to come from
• what data capture methods can be used
• what data processing (calculation and manipulation) must be done to get the required output
• what user actions are necessary to aid data input, processing or output

• how the output information needs to be presented or stored.

A good specification states the user’s needs in such a way that there is no doubt about the scope of the problem and what you need to do to resolve it. You and the user must agree on the specification before you begin work on program design. The program specification needs to be written clearly. You must learn how to define the:

• data input requirements, e.g. types of data, methods of capture, user messages, input forms

• processing to be undertaken, e.g. calculations, text manipulation, decisions, file processing

• data output requirements, e.g. printed reports, screen reports, file storage output.

**Program design**

When you have agreed the program specification with the user you will need to design your program. Design involves thinking about the problem and planning how to solve it. You must learn to consider:

• hardware and software (languages) that are necessary

• how it may be broken down into manageable procedures

• information to be processed

• data and variables that need to be used

• how information will be input

• processing required (how you need to reshape or develop the information)

• how information will be output – screen, printed copy or file

• program structures that are necessary, e.g. sequence, repetition, selection

• the events and user interaction that occur while the program is being used.

You will need to learn how to define and use constants and variables, identifying and using different *data types* including:

• number (different types)

• string

• date

• currency

• Boolean.

Sometimes you will need to use data that is in the form of a table or a record. You must be able to identify and use *data structures* such as an array or a record. Records are often formed by combining a group of different data types into a special user defined data type.
To manipulate or process data you will need to understand how to use operators. Operators may be:

- arithmetic, such as +, -, *, / and ()
- relational, such as =, <, >, <=, >=, <>
- logical, such as AND, OR, NOT.

To undertake string manipulation you will need to be able to use functions such as:

- Len
- Trim$
- Left$
- Right$
- Mid$.

Modern software responds to events caused by the user. Event driven applications execute code in response to an event. Objects such as forms and controls have predefined events and, when an event occurs, the associated event procedure is evoked. You must learn how to use programming tools to respond to events, including:

- mouse clicks
- key depressions
- mouse cursor moving over an object.

Most software that has good visual display makes use of visual objects. You must learn how to use objects when designing your program, including:

- forms
- buttons
- text boxes
- dialogue boxes.

You will also need to learn how to set the properties of an object and define the methods that may operate on the object.

You will need to learn how to get user input into the program and how to display or print output. You must be able to use controls such as:

- labels
- text boxes
- control buttons
- check boxes
- option buttons.
All languages offer ways of controlling the flow of a program by means of **control structures**. You must learn how to use the three main control structures:

- sequence
- selection
- repetition (iteration).

You need to learn that these structures are implemented by program statements such as:

- If…Then…[Else…]
- For…Next
- While…Do…

Well-structured programs will be modularised. You must learn how to design your program to make appropriate use of procedures (or subroutines) and functions.

You may need to modify your program a number of times before you get it right. You must learn to keep version numbers and backup copies as your program develops. You will need to learn how to output information on screen and possibly how to save it to a file or to produce printed copy.

**Documentation**

You must learn to explain your programs to two sets of people: users and experts. When preparing user documentation you should assume that your users have only basic skills such as selecting and running software. Assume that they will find long words and long sentences confusing. Your user documentation should be clear and simple. It may include:

- a summary of the basic hardware and software your program requires
- instructions for installing the program
- instructions for starting the program
- instructions for using the program
- instructions for quitting the program
- examples of on-screen choices and what they offer
- examples of paths through the program
- pictures showing the screen contents at different points (screen prints)
- information about error messages and how to deal with them.

Often a program will need to be changed or updated some time after it was created. Without the support of technical documentation it is very easy to forget how it works or what a specific piece of code is used for. Technical documentation will help you and other people who may need to continue work on your program. It is intended for those who have some expert knowledge.
Your technical documentation should include information on the program’s purpose, how it was produced and all the technical details about how it was written. Comments within the program code should explain how each section of the program works. In technical documentation you can use technical language. Good technical documentation complements user documentation but also offers:

- a specification of what the program should do
- a description or diagram of the modular structure of the program
- tests for input data including, standard data, extreme data and abnormal data
- a list of all variables and their purpose
- a detailed and fully commented listing of the program
- notes on any unusual features.

Testing programs

You must learn to test your programs. You can do this by asking yourself questions such as:

- does the program meet the agreed specification?
- does it deal correctly with normal, extreme and abnormal data?
- is the program robust or can it be made to crash?

You will need to be able to create a test specification that defines tests for:

- acceptable data input values (both maximum and minimum)
- unacceptable data values that should be automatically rejected
- inputs such as mouse or key depressions that require a specific response
- inputs such as mouse or key depressions to which the system should not respond
- checking every path through the program
- checking, independently, that all calculation and manipulation works correctly
- checking that the system meets user requirements.
Standard ways of working

Note: See Unit 1 for full details of the ‘standard ways of working’ you need to know and use. This is a shortened version of the requirements written to apply specifically to this unit.

‘Standard ways of working’ exist to help people to manage their work effectively. You need to learn to:

• edit and save work regularly, using appropriate names for your documents
• store your work where you and others can easily find it
• keep dated backup copies of files on another disk and in another location
• keep a log of ICT problems you met and how you solved them
• avoid bad posture, physical stress, eye strain and hazards from workplace layout.
**You must produce:**

- a working program or programs to meet stated user needs. The program(s) must include most of the data types, objects and events listed under ‘program design’
- user and technical documentation including a test report for the most comprehensive program.

<table>
<thead>
<tr>
<th>To achieve a Grade E you must show you can:</th>
<th>To achieve a Grade C you must also show you can:</th>
<th>To achieve a Grade A you must also show you can:</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1  produce a clear and accurate specification that meets user needs and defines the input, processing and output requirements</td>
<td>C1  produce accurate technical documentation that defines fully all calculation and manipulation, provides clearly commented program listings of all modules and details all user screens and dialog boxes</td>
<td>A1  demonstrate a good understanding of programming through an effective modular design and in your imaginative use of events, objects and controls</td>
</tr>
<tr>
<td>E2  produce a modular program design</td>
<td>C2  produce good-quality user documentation which makes appropriate use of graphic images and screen prints and includes examples of data input screens, output screens, printed output and error messages</td>
<td>A2  create data entry facilities that are clear, well laid out and suitably labelled, validate input data correctly and provide appropriate user guidance</td>
</tr>
<tr>
<td>E3  provide suitable data entry facilities in your program(s)</td>
<td>C3  show that you can work independently to produce your work to agreed deadlines.</td>
<td>A3  design and implement imaginative and customised screen or printed output to provide content and layout that are well matched to user needs</td>
</tr>
<tr>
<td>E4  make appropriate use of sequence, selection and repetition in your program(s)</td>
<td></td>
<td>A4  provide records of thorough module and program testing that checks all major paths, acceptable and unacceptable input and all possible events, and show clearly how any identified problems were resolved to produce a good operational program(s).</td>
</tr>
<tr>
<td>E5  make appropriate use of objects and events in your program(s)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
22.4 Essential Information for Teachers

Guidance on delivery

This unit will provide students with skills that will help them to adapt to any programming language. This unit could be delivered at the same time as advanced Unit 3: Spreadsheet design if a common language can be used for both.

A visual environment using objects and events is used for the unit because ICT students have wide experience in using and configuring software of that type. It is also the most commonly available programming language in schools and colleges. The requirements of this unit can be met with a variety of different programming languages, including:

- Visual C++
- Visual COBOL
- Visual Basic
- Delphi.

It is also possible to meet the requirements of this unit with the macro facilities available in the better quality versions of applications software. Naturally any macro languages chosen must be able to support the use of objects and events.

Choice of programming language is affected by personal preferences, the user requirements and the resources available. This unit has been written to cover the fundamental requirements of any programming activity. The programming language used must be suitable for operation on a GUI system and provide for an object-event based programming environment.

Rather than learning and then applying a range of command structures for the language, students could learn how to define problems, good programming techniques, and how to find out the correct syntax and semantics from documentation and help facilities. An effective way of learning about programming and program design is to review and modify existing programs.

It is probably best to avoid setting problems that involve a great deal of repetitive coding. It is more important for students to concentrate on good practice and structures and to acquire experience in creating and defining a suitable graphical user interface by drawing graphical objects.

The skills developed must include the manipulation of strings as well as numerical variables.

The term iteration is intended to refer to the programming use of the term rather than the mathematical use. In the British Computer Society glossary of terms, the use of the term iteration in relation to programming and the flow of execution has the same meaning as repetition.
Guidance on assessment

The result of your assessment of candidate evidence is an overall mark for the unit. This is then used to generate a unit grade. It also contributes to the total mark for the qualification which in turn is used to generate a qualification grade.

The mark you award must take into account the extent to which the evidence matches both the unit pass standards, represented by the set of criteria in the grade E column of the grid, and the grading standards, represented progressively by the criteria in the grade C and grade A columns. Thus the overall mark you determine for a particular student is based on best-fit judgements of the evidence against successive sets of criteria presented as cumulative grade descriptions for grades E, C and A. When making these judgements you should consider the following general qualities that distinguish between the grades:

- increasing depth and breadth of understanding
- increasing evaluation, analysis and synthesis
- increasing independence and initiative.

Grade E

To achieve an E grade, candidates should aim to provide evidence that covers all the requirements stated in the E grade criteria of the assessment grid. It may be however that a student demonstrates considerable effort and skill in some areas at the expense of precise detail in another. Professional judgement should be used to decide what is a reasonable expectation of candidates and whether the stated quality and sufficiency requirements have, on balance, been met.

Candidates must produce clear and accurate specifications that meet user needs and define the input, processing and output requirements. This may come from a given scenario or specification.

The candidates must make suitable use of objects, such as forms, text boxes, labels, buttons and graphics, and events, such as mouse click, mouse over and key depression events. These must be designed to provide a suitable user interface, including screen messages, menus and data entry forms or similar facilities. They will also need to demonstrate their ability to incorporate all three program structures as well as appropriate calculations and text manipulation.

Candidates must produce clear documentation. The user documentation must enable a non-specialist to use the program effectively and the technical documentation must include listings that are well commented to explain the code used.
Grade C  At this grade, candidates must create suitable ‘user data entry facilities’. These must be easy to understand, have a good clear layout, be suitably labelled and provide the user with data entry messages.

Candidates must be able to identify all paths through the program and be able to produce detailed test specifications together with examples of a full range of acceptable and unacceptable input and associated expected output.

Good-quality user documentation is required for this grade with layout and content well matched to purpose. Candidates must make appropriate use of graphic images and screen prints that include examples of menus, data input screens, output screens, printed output and error messages.

They should work independently to meet a given deadline once they have acquired the necessary knowledge and understanding. This requirement does not mean without teacher intervention or assistance, rather it means that candidates do not display undue dependence. The agreed deadline may be re-negotiated between the candidate and teacher to take into account unforeseen circumstances.

Grade A  For grade A, candidates’ technical documentation will show that all calculation and manipulation is fully defined, and all procedures and sub-routines are clearly commented. They will present clearly all user screens and dialog boxes.

Candidates at this level must keep records of all their work and program testing. The program testing must be shown to check all major paths, all acceptable values of input, all unacceptable input, all possible events and how any identified problems were resolved.

To produce a reliable program all data input should be checked. The candidates must show that they have made good use of validation techniques to trap any incorrect user input.

Candidates’ design and implementation of the program(s) will be well matched to user needs and will show a sympathetic understanding of the user’s perspective. They will use a range of programming facilities imaginatively to achieve a good user interface and effective outcomes.

22.5 Resources  Candidates must have access to a programming language.

22.6 Key Skills Guidance  This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole Advanced VCE. The guidance has been split into two sections: Keys to attainment and Signposts. The two sections should be used in conjunction with each other.

Keys to attainment  These are identified Key Skills or aspects of Key Skills that are central to vocational achievement. If a student has met the indicated vocational requirements of the unit, the key to attainment shows that the relevant aspect of the key skill has also been achieved. A key to attainment does not negate the need for students to develop and practise the key skill during delivery.
Signposts These are naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Candidates will not necessarily achieve the signposted Key Skill through the related vocational evidence. They will need to gain additional evidence elsewhere to ensure that the requirements of the Key Skills Units are fully met.

22.7 Communication Level 3

Keys to attainment

<table>
<thead>
<tr>
<th>When students are:</th>
<th>They will have achieved the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• producing clear technical and user documentation, including images</td>
<td>C3.3 Write two different types of documents about complex subjects. One piece of writing should be an extended document and include at least one image</td>
</tr>
</tbody>
</table>

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• discussing needs with users</td>
<td>C3.1a Contribute to a group discussion about a complex subject.</td>
</tr>
</tbody>
</table>

22.8 Working with Others Level 3

Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
</table>
| • identifying user needs  
• producing a working program or programs to meet stated user needs. | WO3.1 Plan complex work with others, agreeing objectives, responsibilities and working arrangements  
WO3.2 Seek to establish and maintain co-operative working relationships over an extended period of time, agreeing changes to achieve agreed objectives.  
WO3.3 Review work with others and agree ways of improving collaborative work in the future. |
### Signposts

<table>
<thead>
<tr>
<th>If students are:</th>
<th>There may be opportunities for them to develop the following Key Skills evidence:</th>
</tr>
</thead>
</table>
| • producing a working program or programs to meet stated user needs. | PS3.1 Explore a complex problem, come up with three options for solving it and justify the option selected for taking forward.  
PS3.2 Plan and implement at least one option for solving the problem, review progress and revise their approach as necessary.  
PS3.3 Apply agreed methods to check if the problem has been solved, describe results and review their approach to problem solving. |
Key Skills and Other Issues

Key Skills

Opportunities for Key Skills development and assessment are indicated within each unit. In addition, a grid which summarises the wider opportunities across the qualification as a whole is provided.

Key skills links are identified in two ways: Key Skills Signposting and Keys to Attainment.

Key Skills Signposting indicates naturally occurring opportunities for the development of Key Skills during teaching, learning and assessment. Candidates will not necessarily achieve the signposted key skill through the related vocational evidence.

Keys to attainment, where appropriate, are identified Key Skills or aspects of Key Skills which are central to vocational achievement. If a candidate has met the indicated vocational requirements of the unit, the specified key to attainment shows that the relevant aspect of the key skill has also been achieved. A Key to Attainment does not negate the need for candidates to develop and practise the key skill during teaching and learning.

Tables summarising the Key Skills opportunities are given in Appendix E. Details are to be found in each unit.

23.1 IT Key Skill Exemption

Successful Advanced Subsidiary and Advanced VCE ICT candidates will gain full exemption from all the IT Key Skill assessment requirements, internal and external, at Level 3. This exemption applies to the 3, 6 and 12 unit qualifications.

Spiritual, Moral, Ethical, Social, Cultural and Other Issues

24.1 Spiritual, Moral, Ethical, Social and Cultural Issues

This specification offers a range of opportunities for the exploration of spiritual, moral, ethical, social and cultural issues. It is hoped that candidates will gain a greater awareness of the effect of information and communication technology principles applied through technological innovation on all aspects of life. Students are encouraged to understand and discuss the implications of new technology that may influence business, communities and individuals. During their study, candidates will be introduced to how trends in information and communication technology have implications for employment and related changes in the working environment.
### 24.2 European Developments

AQA has taken account of the 1988 Resolution of the Council of the European Community in preparing this specification and associated specimen papers.

### 24.3 Environmental Issues


### 24.4 Health and Safety

Candidates are introduced to health and safety issues addressed in the context of this sector and are made aware of the significance of safe working practice. Standard ways of working is a common area across the entire qualification and features in every unit.


### 24.5 Avoidance of Bias

AQA has taken great care in the preparation of this specification and associated specimen papers to avoid bias of any kind.

### 24.6 Issues for Centres in Wales and Northern Ireland

Terms, legislation or aspects of government that are different from those in England should not disadvantage candidates in Wales or Northern Ireland. Where such situations might occur, including in the external tests, the terms used have been selected as neutral, so that programmes can be developed to reflect local and regional circumstances. Where appropriate, legislation and organisations which are distinctive in Northern Ireland is given.
Centre-Assessed Components

25

Guidance on setting Centre-Assessed Components

25.1 Portfolio Advisers
Advisers will be available to assist centres with any matters relating to portfolio units. Details will be provided when AQA knows which centres are following the specification.

26

Supervision and Authentication

26.1 Supervision of Candidates’ Work
Candidates’ work for assessment must take place under conditions which allow the teacher to supervise and authenticate the work. If it is necessary for some assessed work to be done outside the centre, sufficient work must take place under direct supervision to allow the teacher to authenticate each candidate’s whole work with confidence.

26.2 Guidance by the Teacher
The work assessed must be solely that of the candidate concerned. Any assistance given to an individual candidate which is beyond that given to the group as a whole must be recorded on the Candidate Record Form.

26.3 Unfair Practice
At the start of the course, the supervising teacher is responsible for informing candidates of the AQA Regulations concerning malpractice. Candidates must not take part in any unfair practice in the preparation of portfolio unit work to be submitted for assessment, and must understand that to present material copied directly from books or other sources without acknowledgement will be regarded as deliberate deception. Centres must report suspected malpractice to AQA. The penalties for malpractice are set out in the AQA Regulations.

26.4 Authentication of Candidates’ Work
Both the candidate and the teacher are required to sign declarations confirming that the work submitted for assessment is the candidate’s own. The teacher declares that the work was conducted under the specified conditions and records details of any additional assistance.
27

Standardisation

27.1 Standardising Meetings

Annual standardising meetings will usually be held in the autumn term. Centres entering candidates for the first time must send a representative to the meetings. Attendance is also mandatory in the following cases:

- where there has been a serious misinterpretation of the specification requirements;
- where the nature of portfolio unit tasks set by a centre has been inappropriate;
- where a significant adjustment has been made to a centre’s marks in the previous year’s examination.

Otherwise attendance is at the discretion of centres. At these meetings support will be provided for centres in the development of appropriate portfolio unit tasks and assessment procedures.

27.2 Internal Standardisation of Marking

The centre is required to standardise the assessment across different teachers and teaching groups and within and across units to ensure that all work at the centre has been judged against the same standards. If two or more teachers are involved in marking units, one teacher must be designated as responsible for internal standardisation. Common pieces of work must be marked on a trial basis and differences between assessments discussed at a training session in which all teachers involved must participate. The teacher responsible for standardising the marking must ensure that the training includes the use of reference and archive materials such as work from a previous year or examples provided by AQA. The centre is required to send to the moderator a signed form (Centre Declaration Sheet) confirming that the marking of portfolio work at the centre has been standardised. If only one teacher has undertaken the marking, that person must sign this form.

28

Administrative Procedures

28.1 Recording Assessments Within Each Unit

The candidates’ work must be marked according to the Assessment Evidence Grid set out. Teachers should keep records of their assessments during the course on the Candidate Record Forms, in a format which facilitates the complete and accurate submission of the final overall assessments at the end of the course.

28.2 Submitting Marks and Sample Work for Moderation

For each portfolio unit a mark for each candidate must be submitted to AQA by the date specified. Centres will be informed which portfolio units are required to be submitted in the samples to the moderator.
28.3 Problems with Individual Candidates

Teachers should be able to accommodate the occasional absence of candidates by ensuring that the opportunity is given for them to make up missed assessments.

Special consideration should be requested for candidates whose work has been affected by illness or other exceptional circumstances. Information about the procedure is issued separately.

If work is lost, AQA should be notified immediately of the date of the loss, how it occurred, and who was responsible for the loss. AQA will advise on the procedures to be followed in such cases.

Where special help which goes beyond normal learning support is given, AQA must be informed so that such help can be taken into account when assessment and moderation take place.

Candidates who move from one centre to another during the course sometimes present a problem for a scheme of internal assessment. Possible courses of action depend on the stage at which the move takes place. If the move occurs early in the course the new centre should take responsibility for assessment. If it occurs late in the course it may be possible to accept the assessments made at the previous centre. Centres should contact AQA at the earliest possible stage for advice about appropriate arrangements in individual cases.

28.4 Retaining Evidence and Re-Using Marks

The centre must retain the work of candidates, with Candidate Record Forms attached, under secure conditions, from the time it is assessed, to allow for the possibility of an enquiry upon results. The work may be returned to candidates after the issue of results provided that no enquiry upon results is to be made which will include re-moderation of the work in the portfolio unit(s). If an enquiry upon result is to be made, the work must remain under secure conditions until requested by AQA.

29 Moderation

29.1 Moderation Procedures

Moderation of the portfolio work is by inspection of a sample of candidates’ work by a moderator appointed by AQA. The centre marks must be submitted to AQA by the specified date.

29.2 Post-Moderation Procedures

On publication of the Advanced Subsidiary and Advanced VCE results, the centre is supplied with details of the final marks for the portfolio units. The centre receives a report form giving feedback on the appropriateness of the task set, the accuracy of the assessments made, and the reasons for any adjustments to the marks.

Some candidates’ work may be retained by AQA for archive purposes.
Awards and Reporting

Grading, Shelf-Life and Re-Sits

30.1 Grading System

Individual assessment unit results will be certificated.

All the Advanced Subsidiary and Advanced VCE qualifications will be graded on a five ‘grade’ scale: A, B, C, D and E. Candidates who fail to reach the minimum standard for grade E will be recorded as U (unclassified) and will not receive a qualification certificate.

30.2 Grading Each Unit

Each unit contains its own set of grading criteria, contextualised specifically to the content of that unit. Each unit will be graded according to its own grading criteria.

30.3 Grading Internally Assessed Units

Assessors should use their professional judgement to decide which set of criteria (i.e. grade E, C or A) best describe the depth and quality of the candidate’s work. A range of marks is available within each grade, in order to allow for differentiation and to reward candidates for work at the higher end of each grade. For a mark in the grade D range to be awarded there must be evidence towards the grade C criteria and for a mark in the grade B range to be awarded there must be evidence towards the grade A criteria. Further guidance about the relative importance of each grade C and A criterion in relation to grades D and B will be provided during teacher standardising meetings.

Marks awarded to work which is judged unworthy of grade E are converted to uniform marks and count towards the candidate’s overall grade in the same way as any other uniform marks.

Where the assessor refers work back to the candidate for improvement, any assistance or feedback given must be taken into account when the work is assessed, in line with the GCSE, GCSE in vocational subjects, GCE, VCE, GNVQ and AEA Code of Practice.
30.4 Grading Externally Assessed Units
For a candidate to achieve a grade E in an externally assessed unit, the student’s performance in the external assessment must reach the boundary designated by the awarding body for that specific assessment. Grades D-A will similarly have such boundaries. The candidate’s raw mark will be converted by the awarding body to a uniform mark, which will be reported to the centre.

30.5 Qualification
A candidate’s uniform marks for the units taken are added to give an overall uniform mark. This is then compared to the ranges allocated to each grade for the qualification as a whole.

30.6 Shelf-Life of Unit Results
The shelf-life of individual unit results, prior to certification of the qualification, is limited only by the shelf-life of the specification.

30.7 Assessment Unit Re-Sits
Each assessment unit may be re-sat once only. The better result will count towards the final award. Candidates may, however, re-sit the whole qualification more than once.

30.8 Minimum Requirements
Candidates no longer have to pass every unit to achieve overall qualification certification. Candidates will be graded on the basis of the work submitted for the award of the qualification.

30.9 Quality Assurance
The process for both internal and external assessment (including the mechanism for the aggregation of grades) for this qualification will conform to agreed procedures of the Code of Practice. AQA is committed to the maintenance of national standards and will provide advice about, and moderate, the assessment of candidates’ work in centres.
## Appendices

### Overlaps with Other Qualifications

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<tr>
<th>A.1</th>
<th>GCE AS/A</th>
<th>AQA GCE Information and Communication Technology:</th>
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<td>There are links with this courses throughout, though the assessment criteria and teaching/learning styles are likely to differ.</td>
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<td>AQA GCE Computing:</td>
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<td>Unit 16: Programming particularly links this VCE with AQA GCE Computing, though there are likely to be other areas of overlap.</td>
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<th>A.2</th>
<th>Other AS/VCE</th>
<th>AQA VCE Business:</th>
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<td>Though no specific overlap exists, students will investigate businesses use of ICT throughout the course and will, therefore, gain an awareness and understanding of different types of business organisations.</td>
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<td>AQA Intermediate GNVQ ICT:</td>
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<td>Whilst overlap in terms of level is unlikely, the Intermediate GNVQ provides a basis from which to progress to the Advanced level course. Links between units at different levels are indicated in the About this Unit section of each unit, where appropriate.</td>
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<th>A.3</th>
<th>Relationship with National Occupational Standards</th>
<th>Where a clear relationship exists with national occupational standards, details are stated in the About This Unit section of the specification.</th>
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<td>There are links between this specification and the various ICT related NVQs.</td>
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Centre Declaration Sheet

Externally Assessed Assignment
Centre Declaration Sheet
Series/Year

Qualification [please tick]: VCE ☐ GNVQ Foundation ☐ GNVQ Intermediate ☐

Specification Title: ...............................................................................................................................................

Unit Code: (e.g. L021) ................................................................................................................................. Centre No:  

Centre Name: ...................................................................................................................................................

Controlled Conditions
I confirm that:
(a) the teacher’s notes have been read;
(b) no candidate has spent longer than the time allowed for completing this assignment under controlled conditions;
(c) controlled conditions were followed throughout.

If you are unable to sign this declaration please contact Candidate Services at AQA.

Signature(s) of teacher(s) responsible for controlled conditions. Date: .........................................................
Teacher 1 ........................................................................................................ Teacher 2 ........................................................................................................
Teacher 3 ........................................................................................................ Teacher 4 ........................................................................................................
(continue overleaf if necessary)

Authentication of candidates’ work
Any assistance given to candidates beyond that given to the class as a whole and beyond that described in the specification has been recorded below.

Signature(s) of teacher(s) responsible for authentication ..............................................................
(continue overleaf if necessary)

This form should be completed and sent to the examiner with the attendance register and candidate assignments
Candidate Record Form

Centre-assessed work
Candidate Record Form
Series/Year

AS & Advanced VCE – Information and Communication Technology (8251/8254/8257)

Centre Name: ................................................................. Centre No: 

Candidate Name: ............................................................. Candidate No: 

This side is to be completed by the candidate.

Sources of advice and information

• Any help or information you have received from people other than your subject teacher(s) must be clearly identified in the work itself.

• Any books, information leaflets or other materials (e.g. videos, software packages or information from the Internet) which you have used to help you complete this work must be clearly acknowledged in the work itself. To present material copied from books or other sources without acknowledgement will be regarded as deliberate deception.

NOTICE TO CANDIDATE

The work you submit for assessment must be your own.

If you copy from someone else or allow another candidate to copy from you, or if you cheat in any other way, you may be disqualified from at least the subject concerned.

Declaration by candidate

I have read and understood the Notice to Candidate (above). I have produced the attached work without any help from other people apart from that which I have declared in the work itself. I have acknowledged all source materials in the work itself.

Candidate’s signature: .......................................................... Date: .........................

This form should be completed on each occasion when the candidate submits portfolio work for assessment in this specification. The form should be attached to the candidate’s work and retained at the Centre or sent to the moderator as required.
This side is to be completed by the teacher/assessor.

Marks must be awarded in accordance with the instructions and criteria in the Subject Content section of the specification.

Supporting information to show how the marks have been awarded should be given on the Unit Record Sheets and in the form of annotations on the candidate's work.

Please complete the boxes to show the marks awarded and add any summative comments which seem appropriate in the space below.

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<tr>
<th>Unit Code</th>
<th>Centre mark</th>
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Optional Language Units

Concluding comments

Details of additional assistance given (if any)

Record here details of any assistance given to this candidate which is beyond that given to the class as a whole and beyond that described in the specification. Continue on a separate sheet if necessary.

Teacher/assessor's signature: ................................................................. Date: ..................
D

Unit Record Sheet

Centre-assessed work
Unit Record Sheet
Series/Year

VCE – Information and Communication Technology
(8254/8251/8257)

Unit 1 – Presenting Information (I01A)

Centre Name: ........................................................................................... Centre No: 

Candidate Name: ........................................................................................... Candidate No: 

Assessor’s Name: ........................................................................................... Mark: / 24 

Assessor’s comments
This space may be used to provide justification of the mark awarded.
If the candidate’s work has been referred (i.e. to improve the work submitted), details can be provided here.
The assessment evidence grid for the Unit is reproduced below from Section 7.3 of the specification. This gives details of what the candidate should provide as evidence.

**Complete page references and circle the mark given on the scale below the grid.**

You must produce:
- six original documents you have created for different purposes to show a range of writing and presentational styles. The documents may be in printed form or shown on-screen. They must include one designed to gather information from individuals and one major document of at least three A4 pages
- a report describing, comparing and evaluating two different standard documents used by each of three different organisations (total of six documents).

<table>
<thead>
<tr>
<th>To achieve Grade E you must show you can:</th>
<th>Page</th>
<th>To achieve Grade C you must also show you can:</th>
<th>Page</th>
<th>To achieve Grade A you must also show you can:</th>
<th>Page</th>
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<tbody>
<tr>
<td>E1 create new information that is clear, easy to understand, uses a suitable style and is at a level that suits the intended readers</td>
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<td>C1 achieve a coherent and consistent style, make good use of standard formats, place information in appropriate positions and ensure correct and meaningful content by presenting original draft copies with proof reading corrections and annotations</td>
<td></td>
<td>A1 demonstrate a good understanding of writing style, presentation techniques, standards for special documents and attention to detail by organising a variety of different types of information into a single coherent, imaginative, easy to read presentation of several pages</td>
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<td>E2 use text styles, page layout, paragraph formatting and, where appropriate, common standards for layout that suit the purpose of each document</td>
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<td>C2 describe in detail the content, layout and purpose of the six collected documents, accurately evaluating good and bad points about the writing and presentation styles of similar items, commenting on suitability for purpose and suggesting how they could be improved</td>
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<td>A2 demonstrate effective skills in the appropriate use of software facilities to automate aspects of your document production, such as bullets and numbering, paragraph and heading styles, standardised layout, contents lists and indexes</td>
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<td>E3 use and combine text, graphics, tables, borders and shading effectively</td>
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<td>C3 work independently to produce your work to agreed deadlines</td>
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<td>A3 make appropriate use of lines, borders, shading, tables, graphics and writing style to create a form that is easy to understand and easy to use to enter data and retrieve the information collected</td>
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<td>E4 locate, use and adapt existing information to suit a presentation and list your information sources in an appropriate form</td>
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<td>A4 demonstrate effective skills in the use of graphics to improve a presentation by making appropriate use of pictures, drawings, clip art, lines and borders, graphs or charts</td>
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<td>E5 describe each of the six collected documents clearly and accurately, identifying the common elements of similar documents</td>
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<td>E6 carefully check the accuracy of the layout and content of your six original documents and your report, and proof read to ensure that few obvious errors remain</td>
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<th>D 10 – 12 points</th>
<th>C 13 – 15 points</th>
<th>B 16 – 18 points</th>
<th>A 19 – 24 points</th>
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<td>16 17 18</td>
<td>19 20 21 22 23 24</td>
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Assessor’s signature: ........................................... Date: .................................
### Summary of Key Skills Opportunities

⚙️ = keys to attainment  
📍 = signposts

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<th>Unit 1</th>
<th>Unit 2</th>
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