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WJEC GCSE in Information and Communication Technology

For Examination from 2009



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INFORMATION AND COMMUNICATION TECHNOLOGY

SUMMARY OF ASSESSMENT

| Written Papers (40%) | | | | | | | | | | | |
|---|------------------------|--------------------------|---------------|------------------------|--------------------------|------------|-------|--------|--------|--------|-----------|
| Paper 1 20 % | | | | | | | | | | | |
| <p>Common to GCSE ICT and GCSE (Short Course) ICT, this paper will assess the requirements of the Key Stage 4 Programme of Study for Information Technology and the external component of the Key Skill in IT.</p> <p>The paper is provided in two tiers, Foundation and Higher, as follows:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><i>Option</i></th> <th style="text-align: left;"><i>Targeted Grades</i></th> <th style="text-align: left;"><i>Duration of paper</i></th> </tr> </thead> <tbody> <tr> <td>Foundation</td> <td>G - C</td> <td>1 hour</td> </tr> <tr> <td>Higher</td> <td>D - A*</td> <td>1.5 hours</td> </tr> </tbody> </table> | | | <i>Option</i> | <i>Targeted Grades</i> | <i>Duration of paper</i> | Foundation | G - C | 1 hour | Higher | D - A* | 1.5 hours |
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| Foundation | G - C | 1 hour | | | | | | | | | |
| Higher | D - A* | 1.5 hours | | | | | | | | | |
| Paper 2 20% | | | | | | | | | | | |
| <p>Unique to the full GCSE, this paper will assess, in the main, the 'application' content (section 5.2) of this specification.</p> <p>The paper is provided in two tiers, Foundation and Higher, as follows:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><i>Option</i></th> <th style="text-align: left;"><i>Targeted Grades</i></th> <th style="text-align: left;"><i>Duration of paper</i></th> </tr> </thead> <tbody> <tr> <td>Foundation</td> <td>G - C</td> <td>1 hour</td> </tr> <tr> <td>Higher</td> <td>D - A*</td> <td>1.5 hours</td> </tr> </tbody> </table> | | | <i>Option</i> | <i>Targeted Grades</i> | <i>Duration of paper</i> | Foundation | G - C | 1 hour | Higher | D - A* | 1.5 hours |
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| Foundation | G - C | 1 hour | | | | | | | | | |
| Higher | D - A* | 1.5 hours | | | | | | | | | |
| Coursework (60 %) | | | | | | | | | | | |
| <p>The coursework component consists of a portfolio of work (30%) which shows candidates' attainment in obtaining and interpreting different types of information; using, developing and communicating information to meet the purpose of their studies and presenting the results of their work. This is achieved through tasks involving:</p> <ul style="list-style-type: none"> (i) information handling; (ii) spreadsheet modelling; (iii) communicating information. <p>The full GCSE course includes a project (30%) in which the candidate submits a report on the solution to a problem which demonstrates his/her information systems capability.</p> | | | | | | | | | | | |

| Subject/Option Entry Codes | |
|-----------------------------------|--------|
| Foundation Tier | 178 01 |
| Higher Tier | 178 02 |

Information and Communication Technology

1 INTRODUCTION

1.1 Criteria for GCSE

This specification meets the General Criteria for GCSE and the Subject Criteria for GCSE Information and Communication Technology issued by ACCAC/QCA (March 2000). Assessment for this qualification is carried out according to codes of practice published by the regulatory authorities. The qualification may be undertaken either through the medium of English or of Welsh.

GCSE qualifications are reported on an eight-point scale from A* to G, where A* is the highest grade. Candidates who fail to reach the minimum standard for a grade to be awarded are recorded as U (unclassified) and do not receive a qualification certificate.

GCSE qualifications are expected to show broad equivalence to General National Vocational Qualifications in the following terms:

two GCSEs at grades D to G and two GCSEs at grades A* to C are equivalent to one three-unit GNVQ at foundation and intermediate level respectively;

four GCSEs at grades D to G and four GCSEs at grades A* to C are equivalent to one six-unit GNVQ at foundation level and intermediate level respectively.

The course provides specific exemptions from the Key Skill in Information Technology at levels 1 and 2. Full details are provided in Section 6.

1.2 Rationale

A course in Information and Communication Technology offers a unique opportunity in the curriculum for candidates to identify and solve real problems by designing information and communication systems in a wide range of contexts relating to their personal interests. Information and Communication Technology develops candidates' interdisciplinary skills, all six Key Skills and their capacity for imaginative, innovative thinking, creativity and independence.

The specification encourages the investigation and study of information technology in a variety of contexts. In these contexts the candidates are given opportunities to acquire competence, capability and critical skills through the creation, implementation, use and evaluation of a range of information and communication systems. Candidates from all cultures and both genders can develop their interest in, enjoyment of, and critical reflection about information technology as an integral part of modern society.

The specification uses a range of assessment techniques to enable the candidate to respond graphically and in writing through practical and investigative work. In the final assessment, 60% of the marks are based on internally assessed coursework which allows the candidates to experience an appropriate variety of roles relevant to information technology: user, designer, maker, manager and client. Assessment through coursework will also enable centres to respond positively and quickly to developments in the field of information and communication technology. Five per cent of the marks available in the written coursework will be allocated to the assessment of the quality of the candidate's written communication (in English or Welsh as appropriate).

The remaining 40% of the final assessment will be by differentiated terminal examination papers testing grades G-C and grades D-A*.

This specification has been developed by the WJEC to provide the opportunity for candidates to obtain a qualification in¹:

- either:** GCSE Information and Communication Technology;
- or:** GCSE (Short Course) Information and Communication Technology.

Information and Communication Technology can be taken as an independent short course and successful candidates will be awarded a GCSE (Short Course) Certificate in Information and Communication Technology. The GCSE (Short Course) forms the core of the GCSE specification: it includes half the content of the GCSE and covers the full range of grades. The short course is designed to be delivered in approximately half the time of the full GCSE course and lends itself to cross-curricular delivery in suitably resourced centres.

GCSE candidates take two examination papers: Paper 1 (which assesses the content in section 5.1) and Paper 2 (assessing section 5.2). They are also required to submit a portfolio and a project as detailed in sections 4.7 and 4.8 respectively.

GCSE (Short Course) candidates take only Paper 1 (assessing section 5.1). These candidates are required to submit a portfolio as detailed in section 4.7.

This specification:

- (a) is intended to be of interest to a wide range of candidates including those intending to study Information and Communication Technology or Computing at AS or Advanced Level, some of whom may go on to follow a higher education course or career in Information and Communication Technology or an associated area. Those with other interests and aspirations can also benefit from the many transferable skills inherent in the study of Information and Communication Technology;
- (b) builds upon the knowledge, understanding and skills established by the National Curriculum Key Stage 3;
- (c) promotes progression through the GCSE and provides a suitable foundation for the study of Information and Communication Technology, or a related area of study, at AS or Advanced Level and/or preparation for future employment and the world of work;

¹ This document contains the specific content for the full GCSE course in Information and Communication Technology. A separate document is available for the GCSE (Short Course).

- (d) provides opportunities for candidates to gain a broad understanding of the skills, understanding and knowledge inherent in Information and Communication Technology;
- (e) encourages candidates to develop their critical thinking, to see the relationships between systems designer and user, and the role of Information and Communication Technology within the world in which we live;
- (f) provides opportunities to develop candidates' Key Skills, particularly those in problem solving, use of IT and communication. They will also have opportunities to develop their skills in application of number, working with others and improving own learning and performance;
- (g) is available through the medium of English and Welsh.

1.3 Prior Learning

Although there is no specific requirement for prior learning, this specification builds upon the Programmes of Study for Information and Communication Technology in Key Stages 1-3.

This specification may be followed by any candidate, irrespective of their gender, ethnic, religious or cultural background. This specification is not age specific and, as such, provides opportunities for candidates to extend their life-long learning.

1.4 Progression

This specification builds upon the Programme of study for Information and Communication Technology in Key Stage 3 and allows candidates to fully address the knowledge, skills and understanding required by the National Curriculum Order for Information and Communication Technology.

Whilst there is no specific requirement for prior learning in the WJEC Advanced Subsidiary/Advanced GCE specification in Computing, there is a clear progression route from this specification.

The Advanced Subsidiary/Advanced specification promotes progression through the AS and A Level and provides a suitable foundation for study of the subject or related courses in further or higher education. The AS specification also provides a coherent, satisfying and worthwhile course for candidates who do not wish to progress further in the subject.

1.5 Overlap and Restrictions on Entry

This specification does not overlap with any non-ICT qualification offered by WJEC and there are no restrictions on concurrent entry for other qualifications. It should be noted, however, that candidates will not be permitted to enter GCSE and GCSE (Short Course) Information and Communication Technology in the same sitting, or to take any units from the Applied ICT specification at the same time as either of the above.

The *classification* code for this specification is 2650.

Centres should be aware that candidates who enter for more than one GCSE qualification with the same classification code, will have only one grade (the highest) counted for the purpose of the School and College Performance Tables.

1.6 Candidates with Particular Requirements

Details of the special arrangements and special consideration for candidates with particular requirements are contained in the Joint Council for Qualifications document *Candidates with Special Assessment Needs: Regulations and Guidance*. Copies of this document are available from WJEC.

2

AIMS

2.1 General Aims

The aims set out below recognise that information and communication technology changes the environment and the circumstances in which people find themselves. It requires the application of knowledge, understanding and skills drawn from various areas of activity/enquiry. Some of the aims are reflected in the assessment objectives; others are not because they cannot readily be translated into measurable objectives.

The specification aims to:

- (a) develop the competence of candidates by allowing them to choose, use and design information and communication systems to carry out a range of tasks and to solve problems, making effective use of appropriate principles and techniques;
- (b) develop the capability of candidates through a broad and balanced experience of the range of information and communication systems and their applications;
- (c) develop the knowledge, concepts and skills which will enable the candidates to evaluate critically a range of information systems, including their own, with an understanding of their capabilities and limitations;
- (d) encourage candidates to gather, store, process and present information through activities in a range of contexts. It will also give candidates opportunities to design, implement and document information and communication systems and develop understanding of the wider applications and effects of information and communication technology.

2.2 The spiritual, moral, ethical and cultural dimension

This specification provides opportunities for candidates, through the study of Information and Communication Technology systems and applications, to develop an understanding of spiritual, moral, ethical, social and cultural issues as they relate to the designer, manufacturer or user of ICT.

For example, in section 5.1.1 (b) *information processing*, candidates are asked to consider *the advantages and disadvantages of using Information and Communication Technology for storing, processing and transmission of data*. In part (c) of the same section consideration must be given to *how to protect data from deliberate damage caused by viruses and other types of malicious damage and how to protect stored or transmitted data from unauthorised access*.

Section 5.1.2, *the implications of the use of ICT*, requires that candidates *.....should be able to identify the implications of the use of ICT for individuals, organisations and society* Section 5.1.3, *the impact of ICT*, specifically requires that candidates *.....should be able to reflect critically on the impact of ICT on their own lives and others' considering the social, economic, political, legal, ethical and moral issues*.

In section 5.2.9 (b) *Information systems in society*, candidates are required to *know and understand the provisions of the Data Protection Act 1998; study the Act, the rights of the data subject, the holder and the exemptions; know and understand the purpose of the copyright law and the Computer Misuse Act; study the Act and identify new crimes created and the implications for computer users*.

Health and safety is specifically mentioned in section 5.1.2 (d). Candidates would also be expected to consider these factors when designing their own systems, particularly within the context of the portfolio or project.

Information and Communication Technology also provides opportunities to promote enterprise and entrepreneurial skills through the process of identifying an opportunity to design a system to meet a specific need, investigating the work of professional systems analysts and the IT industry, developing their own system and finally evaluating the whole process. Tasks linked to the portfolio and, in particular, the project provide opportunities to develop independent thinking skills, through candidates identifying relevant sources of information and developing specific performance criteria for their designs to guide their thinking.

2.3 Citizenship

In this context citizenship is taken to include the development of social and moral responsibility, participation in community activity and development of political literacy. This specification is designed to make a contribution to the development of the knowledge, skills and understanding of citizenship. In particular, the coursework element will encourage pupils to take an effective part in school-based and community-based activities, showing a willingness and commitment to evaluate such activities critically. Aspects of the portfolio or the project, for example, could be directly related to the needs of the school or local community, which would provide candidates with the opportunity to tackle problems which are real and meaningful to themselves. In doing so, they will be encouraged to demonstrate personal and group responsibility in their attitudes to themselves and others: they would also need to consider critically and constructively the views of others when developing and evaluating proposed solutions.

The specification content requires candidates to consider the social and moral consequences of the use of information and communication technology. For example, section 5.1.2 (d)(ii), states that candidates should be able to *state potential health hazards when using computers* and be able to *suggest methods for prevention or reducing the risk of potential health hazards* in the electronic office. Section 5.1.3 requires that *candidates should be able to reflect critically on the impact of ICT on their own lives and others', considering the social, economic, political, legal, ethical and moral issues*. The amplification identifies a number of such issues including *.....changes in working practices; legal issues relating to hacking, spreading of viruses, computer fraud and copyright*. Candidates following the full GCSE course additionally need to understand *.....the provisions of the Data Protection Act 1998* along with *..... the purpose of the copyright law and the Computer Misuse Act* so that they are aware of *..... new crimes created and the implications for computer users* (section 5.2.9 (b)).

2.4 The European dimension

This specification, where appropriate for example 5.1.3 *changes in working practices, teleworking, the economic impact of e-commerce* and 5.1.2, (d)(ii) *health and safety in the electronic office*; supports environmental education, the European dimension and health education, consistent with current EC agreements.

The approach used in constructing the specification lends itself to the establishment of links with other areas of study, particularly those involving problem solving or the use of ICT skills, knowledge and understanding for the completion of tasks and assignments in other GCSE specifications.

The above approach conforms with the aspirations expressed in the 1998 Resolutions of the European Community and the Ministers of Education meeting within the Council, concerning the European dimension in education and environmental education, particularly those intended at the level of member states.

2.5 Cwricwlwm Cymreig

The specification framework allows the use of the Welsh context for course designers in Wales to draw on local examples and priorities, thereby allowing development of the Cwricwlwm Cymreig. Course designers in England and Northern Ireland also have the flexibility to draw on their own locality as a resource.

The specification and specimen papers are available through the medium of English or Welsh. In addition, opportunities for the development of Key Skills are highlighted, especially communication, information technology and problem solving, either through the medium of English or Welsh.

3

ASSESSMENT OBJECTIVES

This specification is designed to address the assessment requirements specified in the Subject Criteria for GCSE Information and Communication Technology.

The assessment objectives apply to the whole specification.

There is a subtle variation between the assessment objectives for the full and short course, in relation to the evaluation and documentation requirements of AO2. The full course assessment objectives are listed below. The order in which these assessment objectives are presented does not imply any priority or sequence of work.

Candidates should be able to:

- AO1** apply their knowledge, skills and understanding of ICT to a range of situations;
- AO2** analyse, design, implement, test, evaluate and document information and communication systems for use by others and develop understanding of the wider applications and effects of ICT;
- AO3** reflect critically on the way they and others use ICT;
- AO4** discuss and review the impact of ICT applications in the wider world;
- AO5** consider the social, economic, political, legal, ethical and moral issues and security needs for data which surround the increasing use of ICT.

4

SCHEME OF ASSESSMENT**4.1 Assessed components**

The scheme of assessment will consist of:

- (a) **a terminal examination** carrying 40% of the total marks,
- (b) **coursework** carrying 60% of the total marks.

Candidates will be assessed on accuracy in written communication in the coursework. Five per cent of the marks available will be allocated to the assessment of these skills. Because of the limited opportunity for writing extended prose in the terminal examination written communication is not assessed in this component.

4.2 Terminal examination (40%)

Candidates for the full course will be required to sit **two** examination papers set and marked by the WJEC; paper 1 and paper 2. Candidates for the short course will be required to sit only paper 1, which is common to both courses. The foundation tier papers in each case are of 1 hour's duration, the higher tier papers are of 1 hour 30 minutes' duration.

Paper 1 will cover the requirements of Information Technology at Key Stage 4 in the National Curriculum and also the external test in the key skill of Information Technology. It specifically assesses section 5.1 in this specification (*IT - use and impact on society*).

Paper 2 will assess, in the main, section 5.2 in this specification (*IT - applications*).

The papers will be provided in two tiers, Foundation and Higher which will be targeted at the following grades:

| Option | Targeted Grades | Duration |
|------------|-----------------|-----------|
| Foundation | G – C | 1 hour |
| Higher | D – A* | 1.5 hours |

Candidates will enter for **one** tier in any examination sitting. Candidates achieving less than the minimum mark for the lowest grade will be recorded as 'U' for 'unclassified', though a safety net for candidates entered for the higher tier is provided. An allowed Grade E is awarded on the higher tier for candidates narrowly missing the minimum mark for a grade D. Candidates failing to achieve Grade E are reported as Unclassified.

Differentiation will be achieved by using a variety of styles of questioning to ensure that specification content is tested in such a way as to provide a meaningful examination to candidates of different levels of ability. The content of the foundation and higher tiers will overlap: the principle of incline of difficulty will be built into questions so that the examination will provide an adequate test across the targeted ability range.

4.3 Coursework (60%)

Coursework for the full GCSE will consist of a portfolio and a project: each worth a 30% weighting in the specification. (Short Course candidates submit only the portfolio which in this case is allocated a weighting of 60%.)

Portfolio of work

Candidates are required to submit a portfolio of their work which shows attainment in obtaining and interpreting different types of information; using, developing and communicating information to meet the purpose of their studies and presenting the results of their work.

The assessment criteria have been developed so that the portfolio may be used as a proxy for one of the two specified purposes of the internal key skill component at level 2 or level 1 (depending on performance).

Project

The candidate is required to submit a report on the solution to a problem which demonstrates his/her information systems capability. The subject matter may be drawn from any suitable area.

The assessment criteria have been developed so that the project may be used as a proxy for the second of the two specified purposes of the internal key skill component at level 2 or level 1 (depending on performance). Full details of Key Skills coverage and proxy are provided in section 6.

4.4 Weighting of assessment objectives

The five assessment objectives for the Information and Communication Technology specification are weighted as follows:

AO1 and AO2 together 76-80%
AO3, AO4 and AO5 together 20-24%

The weighting of the assessment objectives within the assessed components of the GCSE specification is as follows:

| Objectives | Portfolio | Project | Paper 1 | Paper 2 |
|----------------|-----------|---------|----------|----------|
| AO1 & AO2 | 30 | 30 | 8 - 12 | 8 - 12 |
| AO3, AO4 & AO5 | 0 | 0 | 8 - 12 | 8 - 12 |
| | 30% | 30% | 16 - 24% | 16 - 24% |

60%

40%

4.5 Methods of differentiation

The scheme of assessment is designed to ensure that all candidates are provided with the opportunity to demonstrate what they know, understand and can do. To this end, differentiation is achieved by the means described below.

The terminal examination papers are provided in two tiers each covering five grades. Within the range of grades for which they are designed, questions will be selected so that candidates are given the opportunity to succeed with a significant number of responses. Questions will be designed so that stimulus material is accessible to all candidates. Particular care will be taken to ensure that the language used in questions is suitable for the range of grades covered. The papers will offer a variety of question types including structured questions. Thus differentiation in the terminal examination papers will be achieved by a combination of differentiation by task and outcome.

Coursework activities should be designed so that candidates of all abilities are presented with tasks which make reasonable demands of them and which assess, in the portfolio, the defined Key Stage 4 Programme of Study. Thus again, differentiation will be achieved by a combination of differentiation by task and outcome.

4.6 Awarding and Reporting

Awards will be reported as grades on the A* to G scale.

4.7 The Portfolio

Candidates are required to submit a portfolio of their work which shows attainment in obtaining and interpreting different types of information; using, developing and communicating information to meet the purpose of their studies and presenting the results of their work.

To fulfil the requirements of the level 2 key skill in IT, the assessment criteria for the portfolio have been developed so that candidates are given the opportunity to produce evidence which shows that they can, within the context of the portfolio, undertake the following tasks.

Task 1 Information handling;

- identify information needed and suitable sources;
- carry out effective searches;
- select information that is relevant to their purpose;

Task 2 Spreadsheet modelling;

- enter and bring together information using formats that help development;
- explore information needed for the purpose;
- develop information and derive new information as appropriate;

Task 3 Communicating information;

- select and use appropriate layouts for presenting combined information in a consistent way;
- develop the presentation to suit the purpose and the types of information;
- ensure work is accurate, clear and saved appropriately.

This evidence may be presented as separate distinct pieces of work or completed as part of a larger integrated task. In the latter case, the purpose of each task must be clear and it is important that there is clear evidence within the candidates' submission for the award of marks under **each** of the three sets of criteria. **In either case work presented must be significantly different to and separate from work presented for the project.**

The grids on pages 14 and 15 show the assessment criteria for each of the three tasks making up the portfolio. Each task is marked out of 20, giving a total mark for ICT skills in this component of 60.

| Information Handling | MAXIMUM MARK | | | | | | | | | | | | |
|--------------------------------------|---|----------------------------------|----------------|--------------------|--|----------------------------------|--|---|-----------------------------|--------------------------|--------------------------------------|---|-------------------------------|
| | Enter data into a database and variety of data types used | Store data (directory structure) | Check accuracy | Check plausibility | Production of graphs/statistics with reasons, sorts with reasons | Two simple searches with reasons | Complex searches with reasons and/or explanation of search | Advanced processing, such as export/import data or automated routines | Design of data capture form | Design of data structure | Design of data validation techniques | Create database and test data validation with normal and illegal data | TOTAL for each section |
| Data entry | 6 | Max 3 | 1 | 1 | 1 | | | | | | | | |
| Simple data processing | 4 | | | | | Max 2 | Max 2 | | | | | | |
| Advanced data processing | 5 | | | | | | | Max 3 | Max 2 | | | | |
| Design of data for processing | 5 | | | | | | | | | 1 | 1 | 1 | 2 |

| Spreadsheets and software modelling | MAXIMUM MARK | | | | | | | | | | | | |
|--|---|----------------------------------|----------------|--------------------|------------------------------------|--|-----------------------------------|---------------------------------|------------------------|---|---|--------------------------------------|-------------------------------|
| | Enter data into a spreadsheet, variety/complexity of data types | Store data (directory structure) | Check accuracy | Check plausibility | Creation and use of simple formula | Production of graphs/statistics with reasons | Investigation, changing data only | Investigation, changing formula | Further investigations | Use of more complex features such as 'if' functions, absolute values, sorts | Advanced processing such as export/import to file, macros | Design and formatting of spreadsheet | TOTAL for each section |
| Data entry | 6 | 3 | 1 | 1 | 1 | | | | | | | | |
| Simple data processing | 5 | | | | | 1 | 1 | 1 | 1 | 1 | | | |
| Advanced data processing | 5 | | | | | | | | | Max 3 | Max 2 | | |
| Design of data for processing | 4 | | | | | | | | | | | Max 4 | |

| Communicating Information | MAXIMUM MARK | Enter data | Store data (directory structure) | Check accuracy/no spelling mistakes | Check plausibility | Suitable presentation of text in one form of data only, e.g. a text only letter or report | Simple formatting techniques have been applied e.g. bold, text alignment | Simple presentation techniques e.g. frames, borders, fill effects, word art, background wizards or any movement effects created by web publishing wizards. | One presentation for stated purpose using one form of electronic combination | A second presentation for stated purpose using one form of electronic combination | Use of more than one form of electronic combination and advanced formatting techniques e.g. headers, footers, margins, tables, pagination, standard navigation techniques, hyperlinks, hover buttons | Advanced processing e.g. export/import to file, macros | Design and explanation of features used | TOTAL for each section |
|--------------------------------------|---------------------|------------|----------------------------------|-------------------------------------|--------------------|---|--|--|--|---|--|--|---|-------------------------------|
| Data entry | 6 | Max 3 | 1 | 1 | 1 | | | | | | | | | |
| Simple data processing | 5 | | | | | 1 | 1 | 1 | 1 | 1 | | | | |
| Advanced data processing | 6 | | | | | | | | | | Max 4 | Max 2 | | |
| Design of data for processing | 3 | | | | | | | | | | | | 3 | |

Additionally, the quality of the candidate's written communication (in English or Welsh) will be assessed in the portfolio. A five percent weighting is allocated to the quality of written communication within the total marks for the portfolio (i.e. 3 out of 63). For transparency and ease of use, these marks are allocated separate descriptors rather than integrating them into the ICT criteria shown in the grids.

Candidates are required to:

- present relevant information in a form that suits its purpose;
- use a suitable structure and style of writing;
- ensure that text is legible and that spelling, punctuation and grammar are accurate, so that meaning is clear.

The marks for quality of written communication will be awarded as follows:

| | | |
|--------------------------|---|----------------|
| Threshold performance | Form, structure and style of writing appropriate in few respects; legibility and accuracy in spelling, punctuation and grammar barely adequate to convey meaning. | 1 mark |
| Intermediate performance | Form, structure and style of writing mainly appropriate; generally clear expression; good legibility and mainly accurate spelling, punctuation and grammar. | 2 marks |
| High performance | Highly appropriate form, structure and style of writing; meaning clearly expressed; good legibility and highly accurate spelling, punctuation and grammar. | 3 marks |

4.8 The Project

The project is submitted by full GCSE candidates only.

These candidates will be required to submit a report on the solution to a problem which demonstrates their information systems capability. The subject matter may be drawn from any suitable area.

The assessment criteria have been developed so that the project may be used as a proxy for the second of the two specified purposes of the internal key skill component.

Whilst the project, like the portfolio, assesses work broadly defined as involving *Information Handling, Modelling and Communicating Information*, **the work presented must be significantly different to and separate from work presented for the portfolio**, as noted earlier.

Marking Criteria for the Project

(a) STATEMENT OF PROBLEM AND ANALYSIS [10 marks]

This includes a description of the problem area, the background analysis, the problems encountered with the present system and the desired outcome.

| | |
|--|---|
| Title and background | 2 |
| Analysis of the current system | 4 |
| Problems with or limitations of the current system | 2 |
| Aims and Objectives | 2 |

(b) DESIGN OF SOLUTION [12 marks]

| | |
|---|---|
| Alternative methods | 1 |
| Software | 1 |
| Information Handling Data capture form, data structure Design of data validation techniques | 3 |
| Modelling Hand drawn design of sheet Design of formulae Use of more complex designs or formulae | 3 |
| Communicating Information Design of first presentation Design of second presentation Quality of annotation (detail such as scanned image) | 3 |
| Design of data flow | 1 |

(c) **DEVELOPMENT OF THE SOLUTION** [30 marks]

| | | |
|---|---|----------|
| User documentation (1 mark for environment, 1 mark for access and security, 1 mark for instructions on use, 1 mark for advanced features) | | 4 |
| Data flow (1 mark for template, 1 mark for use) | | 2 |
| Information Handling | | 8 |
| Create database | 2 | |
| Variety of fields | 1 | |
| Test plan: | | |
| Editing and deleting or graphing | 1 | |
| Simple search and a sort | 1 | |
| Complex search | 1 | |
| Implementation of test plan | 2 | |
| Modelling | | 8 |
| Create a sheet | 1 | |
| Check plausibility/accuracy of sheet | 1 | |
| Test plan: | | |
| Generate a chart or graph from data for a stated purpose | 1 | |
| Plan a <i>what if</i> investigation including a change of data for a stated purpose | 1 | |
| Plan a <i>what if</i> investigation involving a change of formula for a stated purpose | 1 | |
| Evidence of the three tasks | 3 | |
| Communicating Information | | 8 |
| Create presentation one | 1 | |
| Create presentation two | 1 | |
| Plausibility/Accuracy of both | 1 | |
| Simple presentation (one form of electronic communication) | 1 | |
| Complex presentation * (more than two electronic combinations in one presentation) | 2 | |
| Advanced techniques for formatting and layout such as formatting, layout, hyperlinks, hover buttons, etc. | 2 | |
| * <i>If a complex presentation is done twice, the second has to be awarded as a simple presentation.</i> | | |

(d) **EVALUATION** [8 marks]

| | |
|---|----------|
| Evaluate the appropriateness of data in the database | 1 |
| Comment on how well the database system worked | 1 |
| Evaluate the appropriateness of data in the model | 1 |
| Comment on how well the model worked | 1 |
| Evaluate the appropriateness of data in the presentation | 1 |
| Comment on how well the presentation worked | 1 |
| Identify future modifications & developments for the system | 2 |

Additionally, the quality of the candidate's written communication (in English or Welsh) will be assessed in the project. A five percent weighting is allocated to the quality of written communication within the total marks for the project (i.e. 3 out of 63). For transparency and ease of use, these marks are allocated separate descriptors rather than integrating them into the ICT criteria shown above.

Candidates are required to:

- present relevant information in a form that suits its purpose;
- use a suitable structure and style of writing;
- ensure that text is legible and that spelling, punctuation and grammar are accurate, so that meaning is clear.

The marks for quality of written communication will be awarded as follows:

| | | |
|--------------------------|---|----------------|
| Threshold performance | Form, structure and style of writing appropriate in few respects; legibility and accuracy in spelling, punctuation and grammar barely adequate to convey meaning. | 1 mark |
| Intermediate performance | Form, structure and style of writing mainly appropriate; generally clear expression; good legibility and mainly accurate spelling, punctuation and grammar. | 2 marks |
| High performance | Highly appropriate form, structure and style of writing; meaning clearly expressed; good legibility and highly accurate spelling, punctuation and grammar. | 3 marks |

5 SPECIFICATION CONTENT

5.1 INFORMATION TECHNOLOGY – USE AND IMPACT ON SOCIETY

The specification content incorporates the Programmes of Study for Information Technology. It has been presented in a framework of Information Technology applications:

- information processing;
- the implications of the use of ICT;
- the impact of ICT on their own and others' lives;
- problem solving using ICT.

In 2009, *for the purpose of the terminal examination only*, in order to interpret questions and describe their answers, candidates will be expected to have experienced the concepts and facilities detailed below. Experience should be appropriate to the level at which the candidate is working.

(a) (i) **Experience of Information Retrieval packages covering the following:**

the concepts of records and fields;
 the insertion and deletion of fields;
 the insertion and deletion of records;
 editing of information within records;
 a simple search on one criterion only;
 a complex search on two or more criteria by means of one or more of:

- (I) carrying out a sequence of simple searches where each search takes into account the records found in the previous search;
- (II) linking simple search instructions with the use of logical operators;
- (III) allowing key word searches or
- (IV) allowing refinement of searches when using complex menus;

control of the content of reports by selection of fields;
 control of the format of reports;
 the import or export of data.

(ii) **Experience the retrieval of information from the Internet and from multi-media CD-ROMs.**

(b) **Experience of a Spreadsheet package which allows:**

entry of text and numbers into cells;
entry of formulae into cells;
insertion of columns and rows;
formatting of cells;
editing of entries within cells;
replication of cells;
use of functions;
presentation of data in the form of graphs;
control of the format of reports.

(c) **Experience of a Word Processing package which allows:**

movement, copying and deletion of blocks of text;
the alteration of margins;
the alteration of line spacing;
the use of tabulation;
left, right, centred and full justification;
automated routines such as headers and footers, pagination etc.

(d) **Experience of a Desk Top Publishing package which allows:**

the importing of text;
the importing of graphics;
the formatting of text;
the manipulation of text and graphics within a page;
changes in font type;
changes in font style;
changes in font size.

Note

The evidence provided in the portfolio is not restricted to the above software types and facilities.

Candidates may wish to use other applications software such as CAD, Art, Music, Multimedia, Simulations and Presentation Packages. Centres must, however, ensure that use of such software packages allows candidates to meet the assessment criteria.

This section forms the content of the Short Course specification. In the full GCSE specification it is specifically assessed in Paper 1 and the portfolio.

5.1.1 INFORMATION PROCESSING

| Content | Amplification |
|--|---|
| (a) Data, Information and Knowledge. | <p><i>Candidates should understand:</i></p> <ul style="list-style-type: none"> • <i>data consists of raw facts and figures e.g. readings from sensors, survey facts;</i> • <i>information is data which has been processed by the computer;</i> • <i>knowledge is derived from information by applying rules to it;</i> • <i>the need for good quality data; G.I.G.O. (Garbage In, Garbage Out).</i> |
| (b) The advantages and disadvantages of using Information and Communication Technology for storing, processing and transmission of data. | <ul style="list-style-type: none"> • <i>The potential benefits of encoding data;</i> • <i>the improved speed of access to data;</i> • <i>the variety of output formats available;</i> • <i>the potential and availability of improved services when using ICT.</i> |
| (c) Methods for securing data. | <p><i>Candidates should be able to identify:</i></p> <ul style="list-style-type: none"> • <i>potential types of errors and understand methods for minimising the risk of errors;</i> • <i>data validation techniques for single user and online systems such as range checks, format checks, presence checks and check digits;</i> • <i>how to protect data from accidental destruction;</i> • <i>how to protect data from deliberate damage caused by viruses and other types of malicious damage;</i> • <i>how to protect stored or transmitted data from unauthorised access.</i> |

5.1.2 THE IMPLICATIONS OF THE USE OF ICT

| Content | Amplification |
|--|---|
| <p>Candidates should be able to identify the implications of the use of ICT for individuals, organisations and society in each of the following areas:</p> | <p><i>Candidates should understand when it is appropriate to use and be able to describe the following systems:</i></p> |
| (a) ICT used by retail services. | <ul style="list-style-type: none"> • <i>Point of Sales;</i> • <i>stock control;</i> • <i>online booking;</i> • <i>banking systems.</i> |
| (i) Identify the data required and methods of capturing data and the advantages and disadvantages of using these methods. | <ul style="list-style-type: none"> • <i>Barcodes;</i> • <i>POS terminals;</i> • <i>OMR;</i> • <i>MICR;</i> • <i>OCR;</i> • <i>machine readable tags;</i> • <i>portable data entry (PDET);</i> • <i>touch sensitive data entry devices.</i> |
| (ii) Describe the function of an automatic shopping system. | <p><i>Systems which control the selling, ordering, supply and delivery of goods.</i></p> |
| (b) Identify the technology responsible for the replacement of cash. | <p><i>Electronic funds transfer at the point of sale (EFTPOS), automatic teller machines (ATMs), cheque processing, home banking, smart cards and loyalty cards.</i></p> |
| (c) Communications Services. | <p><i>Candidates should be able to:</i></p> <ul style="list-style-type: none"> • <i>describe the services available on the Internet, such as email, online databases, teleconferencing, e-commerce, telebanking, web publishing, chat lines, fax, radio, music and video broadcasting;</i> • <i>describe the hardware and software needed to access the Internet;</i> • <i>understand the differences between teletext and interactive services;</i> • <i>describe the services obtainable through interactive digital television;</i> • <i>describe the services obtainable through cellular mobile phones.</i> |

- *describe the advantages and disadvantages of using newer technological forms of communication over traditional forms of communication such as the postal service and landline telephones.*
- (d) The Electronic Office: *Candidates should be able to:*
- (i) identify and describe the hardware and software required to change, process and transmit information in the automated office.
- *describe the hardware used in networks and the advantages and disadvantages of using networks;*
 - *identify developments in the automated office such as the Internet and Intranets and be able to state potential uses of such developments;*
 - *describe the facilities offered and the benefits of using software packages such as word-processing and desktop publishing software, spreadsheets, information handling software, communications software and graphic design software;*
 - *describe new developments in interfaces such as GUIs, WIMPS, voice, special devices such as Braille keyboards, concept keyboards and touch sensitive devices.*
- (ii) health and safety.
- *State potential health hazards when using computers;*
 - *suggest methods for prevention or reducing the risk of potential health hazards.*
- (e) ICT in the home & leisure activities. *Candidates should be able to describe:*
- *the use of ICT in the home to support home learning and improve lifestyles;*
 - *ICT based leisure activities such as home publishing, games, DVD films, computer art, interactive television services, music and sound technology;*
 - *computer control in the home, such as alarm systems, environmental control in homes and gardens, microprocessor control in electrical appliances such as refrigerators, VCRs.*
- (f) Education.
- *Effects upon patterns of learning (e.g. attention span);*
 - *the benefits of using ICT in aiding learning (e.g. for coursework, special needs, distance learning) and organising events in school;*
 - *the use of datalogging and control in the school environment and understanding the advantages and disadvantages of using this technology .*

5.1.3 THE IMPACT OF ICT

| Content | Amplification |
|--|---|
| Candidates should be able to reflect critically on the impact of ICT on their own lives and others', considering the social, economic, political, legal, ethical and moral issues. | <p>Candidates should understand issues relating to:</p> <ul style="list-style-type: none">• <i>employment;</i>• <i>retraining;</i>• <i>changes in working practices;</i>• <i>teleworking;</i>• <i>the economic impact of e-commerce;</i>• <i>codes of practice;</i>• <i>legal issues relating to hacking, spreading of viruses, computer fraud and copyright.</i> |

5.1.4 PROBLEM SOLVING

| Content | Amplification |
|----------------------------|--|
| Problem solving using ICT. | <p>Candidates should be able to:</p> <ul style="list-style-type: none">• <i>use information sources and know when it is appropriate to use ICT tools to share, exchange and present information in a variety of contexts;</i>• <i>apply, as appropriate, the concepts and techniques of using ICT to measure, record, respond to control and automate events;</i>• <i>use and apply, as appropriate, ICT to explore develop and interpret information and solve problems in a variety of contexts and suggest hardware, software and processing activities suitable for solving data handling problems;</i>• <i>apply, as appropriate, the concepts and techniques of ICT based modelling, considering their advantages and limitations against other methods;</i>• <i>consider how the information found and developed using ICT should be interpreted and presented in forms that are sensitive to the needs of particular audiences, fit for purposes and suit the information content.</i> |

Teachers should keep up to date with current ICT developments, especially those which are generally accepted in all of the above applications.

5.2 INFORMATION TECHNOLOGY - APPLICATIONS

This section does **not** form part of the Short Course. In the full GCSE course it is specifically assessed in Paper 2 and the project.

Candidates must demonstrate knowledge and understanding of the range and scope of information processing applications and the techniques and systems, including the software and hardware sub-systems, needed to support them.

5.2.1 APPLICATIONS

| Content | Amplification |
|----------------------|---|
| Applications of ICT. | <p><i>Candidates should be able to demonstrate a knowledge and understanding of a variety of computer applications. They will not be expected to have specific knowledge of every kind of application, but should be able to comment sensibly on suggested applications from the list overleaf and make use of specific, relevant examples for illustration. It is expected that candidates will have studied a varied sample of the applications listed overleaf, and be aware of current developments in these applications.</i></p> <p><i>* Applications should be studied from the perspective of:</i></p> <ul style="list-style-type: none"> <i>(a) how data is captured, checked and entered;</i> <i>(b) which processing method is used, i.e. batch, real time, real time transaction;</i> <i>(c) what the minimum hardware and software requirements are;</i> <i>(d) how the information is output;</i> <i>(e) what the security implications are.</i> <p><i>* Candidates should be able to describe:</i></p> <ul style="list-style-type: none"> <i>(i) suitable data, file or database structures;</i> <i>(ii) suitable computer systems including data capture, output and communication devices;</i> <i>(iii) suitable software tools and techniques used in the processing and presentation of the data (searches, sorts, updating, output reports or techniques relevant to particular applications, for example, rotation in CAD);</i> <i>(iv) suitable verification, validation and security and back-up systems;</i> <p><i>associated with each of the named applications.</i></p> |

The applications relevant to this GCSE specification can be grouped in the following way:

Group A *Process control in industry, Payroll, Weather forecasting, Libraries.*

Group B *Robotic and embedded control, Automatic stock control and order processing, Expert systems in medicine, Booking systems.*

Group C *Use of computer control in hospitals, Billing systems, CAD/CAM, Cal and the use of computers in school administration.*

** Whilst candidates should have a general awareness of all these applications, each year **only one** of the groups needs to be covered in the depth shown above.*

*For the 2009 examination, **Group A** should be covered in detail.*

*For the 2010 examination, **Group B** should be covered in detail.*

5.2.2 INFORMATION PROCESSING

| Content | Amplification |
|-------------------------|--|
| Input, process, output. | <i>Candidates should be aware of the three stages of the information processing cycle.</i> |

5.2.3 CONTROLS ON DATA

| Content | Amplification | | | | |
|--|---|---------------------|-------------------|--|--|
| | <i>Candidates should:</i> | | | | |
| (a) The methods used to gather, store, process and present information in a number of applications. | <i>know when, where and why the following methods of data collection are used: questionnaires, data capture forms, data logging and automated data capture (to include OMR, OCR, MICR, bar codes, magnetic strips);</i> | | | | |
| (b) The advantages and disadvantages of using computers in the given application. | <i>appreciate their suitability within the application being studied;</i> | | | | |
| (c) Validation and verification. | <i>be able to define validation as checking that the data is sensible, fair and reasonable or is within stated ranges;</i> | | | | |
| | <i>and verification as checking that data has been copied from one medium to another correctly;</i> | | | | |
| (d) The need for verification and validation. | <i>understand the need for verification and validation;</i> <i>be aware of the possible sources of error which could exist and they should have a knowledge of techniques used to overcome these (eliminate errors);</i> | | | | |
| (e) Know the methods used for validation and verification and where they are appropriate. | <i>describe the following:</i> <table border="0" data-bbox="571 1308 1193 1516"> <thead> <tr> <th data-bbox="571 1308 719 1339">Verification</th> <th data-bbox="954 1308 1082 1339">Validation</th> </tr> </thead> <tbody> <tr> <td data-bbox="571 1346 788 1444"> <ul style="list-style-type: none"> • <i>parity check</i> • <i>double keying</i> • <i>visual check</i> </td> <td data-bbox="954 1346 1193 1516"> <ul style="list-style-type: none"> • <i>range check</i> • <i>check digits</i> • <i>presence checks</i> • <i>batch totals</i> • <i>hash totals</i> </td> </tr> </tbody> </table> | Verification | Validation | <ul style="list-style-type: none"> • <i>parity check</i> • <i>double keying</i> • <i>visual check</i> | <ul style="list-style-type: none"> • <i>range check</i> • <i>check digits</i> • <i>presence checks</i> • <i>batch totals</i> • <i>hash totals</i> |
| Verification | Validation | | | | |
| <ul style="list-style-type: none"> • <i>parity check</i> • <i>double keying</i> • <i>visual check</i> | <ul style="list-style-type: none"> • <i>range check</i> • <i>check digits</i> • <i>presence checks</i> • <i>batch totals</i> • <i>hash totals</i> | | | | |

5.2.4 STORING INFORMATION

| Content | <i>Amplification</i> |
|---|--|
| | <i>Candidates should:</i> |
| (a) Data types. | <i>be aware of a variety of data types, to include strings (alphanumeric), integer, decimal, currency, dates, calculated fields, picture, sound and video;</i> |
| (b) Define a field. | <i>understand that a field is a group of related characters;</i> |
| (c) Define fixed and variable length fields. | <i>understand that a fixed length field has a pre-defined number of characters;</i> |
| | <i>and that a variable length field uses only the amount of memory necessary;</i> |
| | <i>appreciate the benefits and drawbacks of each type;</i> |
| (d) Define a record. | <i>understand that a record is a collection of related fields;</i> |
| (e) Define a file. | <i>understand that a file is a collection of related records;</i> |
| (f) Uses of files: | |
| • master file; | <i>understand that a master file is a permanent file kept up to date by applying the transactions that occur during the operation of the business;</i> |
| • transaction file; | <i>understand that transaction files contain details of all transactions that have occurred in the last period of processing;</i> |
| • archive file. | <i>understand that an archive file is kept for legal reasons and is stored off-site;</i> |
| (g) Database. | <i>understand that a database is an organised collection of related files;</i> |
| (h) Consider file size and its implications for storage. | <i>be aware of limitations and advantages of different storage devices;</i> |
| (i) The use of compression, its advantages and disadvantages. How data encoded in suitable formats affects file size and ease of retrieval. | <i>be aware of the uses of compression for storage of files and its advantages (saving disk space);</i> |
| | <i>understand when compressed files need to be decompressed and be aware of any potential problems this may cause (the need for a decompression program to be present when viewing files);</i> |
| (j) Physical and software methods of securing data. | <i>be able to describe a range of methods such as passwords, including identification, authentication and authorisation, encryption, backups, fireproof environments, voice prints, locks, identity cards.</i> |

5.2.5 MANIPULATING INFORMATION

| Content | <i>Amplification</i> |
|---|---|
| (a) Organising and updating files. | <p><i>Candidates should:</i></p> <p><i>understand the reasons for updating files; sorting, editing existing data, adding new data, deleting old data;</i></p> |
| (b) How to search and select information. | <p><i>be able to:</i></p> <ul style="list-style-type: none"> • <i>identify suitable sources of information, including files on disks, CD-ROMs, databases, the Internet;</i> • <i>search for information using multiple criteria, including operators such as 'and', 'greater than' and tools such as search engines;</i> • <i>respond to an enquiry, write a project report, help solve a problem, design or make something.</i> |
| (c) How to develop information. | <p><i>be able to:</i></p> <ul style="list-style-type: none"> • <i>enter and bring together information, such as 'copy and paste', or import text, images or numbers;</i> • <i>explore information, for example exploring the effects of changing information in a spreadsheet model to make and test predictions;</i> • <i>develop information in the form of text, images and numbers, such as link information, organise information under headings, restructure tables, generate charts and graphs from data, select records or fields and prepare reports from a database;</i> • <i>derive new information, for example compare information from different sources to reach a conclusion, use formulae to calculate information such as total or average.</i> |
| (d) How to present information. | <p><i>be able to:</i></p> <ul style="list-style-type: none"> • <i>select and use appropriate layouts for presenting combined information;</i> • <i>present information in a consistent way;</i> • <i>develop information to suit a specified purpose;</i> • <i>ensure work is accurate and clear (by, for example, spell checking) and saved appropriately (within suitable folders etc.)</i> |

5.2.6 HARDWARE

| Content | <i>Amplification</i> |
|------------------------|--|
| | <i>Candidates should:</i> |
| (a) Types of computer. | <i>have an understanding of their use and application. To include: mainframes (including single processing and parallel processing computers), micro computers, embedded computers, laptops and palmtops;</i> |
| (b) Computer memory. | <i>understand bits, bytes, (including kilo, mega, giga, and their relationship), word, disk cache (reason for and use), use and definition of RAM and ROM. Candidates should also be aware of demands on memory made by modern software;</i> |
| (c) Storage devices. | <i>appreciate the appropriate use of: hard disks, floppy disks, CD and DVD ROMs (read only, writable and re-writable), magnetic tape, removable media (zip and jazz), optical disks;</i> |
| (d) Input devices. | <i>understand the use and application of: keyboard, mouse, direct data entry, sound sampling, joysticks, graphic tablets, pens, scanners, sensors, digital cameras, digital video cameras (including web cams), MIDI, photo cells, microphone, specialist devices such as touch sensitive data entry devices, Braille keyboards;</i> |
| (e) Output devices. | <i>understand the use and application of: monitors (screens, VDUs), thin film transistor (TFT), LCD, thin screens (plasma), printers (laser, ink-jet, dot matrix, thermal), computer output on microfilm, graph plotters, speech synthesis, control interface and actuators, specialist devices such as CNC lathes, millers or embroiders for CAM.</i> |

5.2.7 SOFTWARE

| <i>Content</i> | <i>Amplification</i> |
|---|--|
| <p>(a) Operating systems.</p> <p>Functions of an operating system.</p> <p>Different types of operating systems.</p> | <p><i>Candidates should:</i></p> <p><i>understand that an operating system is software that:</i></p> <ul style="list-style-type: none"> • <i>supervises the running of other programs;</i> • <i>maximises the use of the computer's memory;</i> • <i>handles inputs and outputs and the storage of data;</i> • <i>handles interrupts;</i> <p><i>be able to distinguish between the different types of operating systems and their appropriate use including:</i></p> <ul style="list-style-type: none"> • <i>single program;</i> • <i>batch processing;</i> • <i>multi-programming;</i> • <i>multi-access;</i> • <i>multi-tasking;</i> • <i>distributive;</i> • <i>real time (process control);</i> • <i>real time (transaction processing);</i> • <i>parallel processing systems;</i> • <i>interactive.</i> <p><i>Candidates should also be familiar with the terminology on-line and off-line.</i></p> |
| <p>(b) System security.</p> | <p><i>understand the differences between security of single-user and multi-user systems;</i></p> |
| <p>(c) User interface.</p> | <p><i>be able to describe the features of the different types of user interface including command, menu and graphical systems and be able to discuss the advantages and disadvantages of each;</i></p> <p><i>be aware of the terms GUI (graphical user interface), and WIMP (windows, icons, mouse/menu, pointer);</i></p> <p><i>be aware of sound and speech driven interfaces;</i></p> <p><i>be aware of features such as colour, position and common formats.</i></p> |

5.2.8 NETWORKS

| Content | <i>Amplification</i> |
|-----------------------------|---|
| (a) Types of network. | <i>Candidates should:</i> <i>understand the differences between peer to peer and client/server systems;</i> <i>appreciate the differences between local (LAN) and wide area (WAN) networks;</i> <i>be familiar with network topologies including bus, star and ring;</i> |
| (b) Network security. | <i>appreciate how data can be made secure on networks, including the use of passwords, encryption, back-ups, file access rights, transaction logs;</i> |
| (c) Advantages of networks. | <i>be able to compare the advantages and disadvantages of network systems in comparison with standalone computers;</i> |
| (d) Data transmission. | <i>be aware of the software and hardware needed to allow data to be transferred in the following ways: cable, microwave, infra-red, radio, satellite.</i> |

5.2.9 SYSTEMS ANALYSIS

| Content | <i>Amplification</i> |
|---|---|
| | <i>Candidates should:</i> |
| (a) The four stages involved in the analysis, design, implementation and maintenance of a system. | <p><i>be able to describe the four stages:</i></p> <p>ANALYSIS <i>suitable data collection techniques such as interviews, questionnaires, personal observation and existing documentation; data required, processing and outputs from the present system; the concept of a feasibility report outlining the potential costs and benefits of a new or improved computerised system; the features of the system which make it suitable for computerisation.</i></p> <p>DESIGN <i>the identification of: hardware and software requirements; suitable controls on data and the flow of data through the system; suitable output reports; suitable security systems; appropriate system testing and system documentation; the social implications of the new system; environmental and health considerations.</i></p> <p>IMPLEMENTATION <i>advantages and disadvantages of the following change over methods and when it would be appropriate to use each one: direct changeover; parallel running; pilot study; phased conversion. System evaluation (the impact on jobs in terms of retraining, redundancies and new jobs; potential social problems and methods of avoiding or resolving those problems).</i></p> <p>MAINTENANCE <i>keeping the new system up to date, error free and the need to improve the system after it is implemented; updating user and technical documentation, understanding the need for effective and well-written documentation.</i></p> <p><i>It is expected that testing will take place at every stage.</i></p> |

(b) Information systems
in society.

Data Protection Act. *know and understand the provisions of the Data Protection Act 1998;*

study the Act, the rights of the data subject, the holder and the exemptions;

Copyright law and
the Computer Misuse
Act. *know and understand the purpose of the copyright law and the
Computer Misuse Act;*

*study the Act and identify new crimes created and the implications
for computer users.*

Teachers should keep up to date with current hardware and software developments.

6

KEY SKILLS

The regulatory authorities have stated that candidates taking a qualification in Information and Communication Technology should not be involved in unnecessary double assessment when seeking a Key Skills qualification. Successful completion of a full GCSE or GCSE (Short Course) in Information and Communication Technology provides full or partial exemption from the Key Skill in IT in the following ways:

- A* to C performance in the **GCSE course** provides full exemption of the key skill at level 2;
- D to G performance in the **GCSE course** provides full exemption of the key skill at level 1;
- A* to C performance in the short course provides exemption of the external test in the key skill at level 2 and also for one of the two specified purposes of the internal key skill component at level 2;
- D to G performance in the short course provides exemption of the external test in the key skill at level 1 and also for one of the two specified purposes of the internal key skill component at level 1.

The overview grid shows where opportunities occur in the specification as a whole for the generation of evidence for each of the six key skills. The ICT grid which follows it provides a more detailed analysis of the relationship between this specification and the requirements of the key skill in IT.

The portfolio and project will provide opportunities for candidates to gain evidence of all six key skills. Within the context of the requirements of the key skill in IT, the portfolio provides opportunities for candidates to:

- search for and select information for a purpose;
- explore and develop information and derive new information for a purpose;
- present combined information for a purpose.

The key skill in IT requires the completion of the above for **two** different purposes. The project provides candidates with the opportunity to generate evidence for the second purpose.

Paper 1 specifically addresses the key skill in IT, covering issues such as the benefits and disadvantages of using IT; when it is necessary to observe copyright or confidentiality; how to identify errors and their causes and minimise risks from viruses; and how to work safely when using IT and minimise health risks. Though not specifically mapped out in the same way, paper 2, by assessing the content presented in section 5.2 (IT - Applications), will also cover some of this material.

OVERVIEW GRID

Main opportunities for generating Key Skills evidence are illustrated by a tick

| | GCSE ICT Specification | | | | | |
|--|------------------------|-----|-----------------------|-----------------------|-----------|---------|
| | Content | | Paper 1 (see note) | Paper 2 (see note) | Portfolio | Project |
| | 5.1 | 5.2 | | | | |
| Key Skills Level 2 | | | | | | |
| C2.1a Contribute to a Discussion | ✓ | ✓ | | | ✓ | ✓ |
| C2.1b Give a Short Talk | ✓ | ✓ | | | ✓ | ✓ |
| C2.2 Read/Summarise Information | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| C2.3 Write Different Types of Document | ✓ | ✓ | | | ✓ | ✓ |
| N2.1 Interpret Information | ✓ | ✓ | | | ✓ | ✓ |
| N2.2 Carry out Calculations | ✓ | ✓ | | | ✓ | ✓ |
| N2.3 Interpret Results of Calculations | ✓ | ✓ | | | ✓ | ✓ |
| IT2.1 Search for/Selecting Information | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IT2.2 Explore/Developing Information | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IT2.3 Present Combined Information | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| WO2.1 Planning Activities | | | | | ✓ | ✓ |
| WO2.2 Working Towards Objectives | | | | | ✓ | ✓ |
| WO2.3 Exchanging Information on Progress | | | | | ✓ | ✓ |
| LP2.1 Setting Targets | ✓ | ✓ | | | ✓ | ✓ |
| LP2.2 Using Plans | ✓ | ✓ | | | ✓ | ✓ |
| LP2.3 Reviewing Progress | ✓ | ✓ | | | ✓ | ✓ |
| PS2.1 Identify problems and options | | | | | ✓ | ✓ |
| PS2.2 Plan and try out options | | | | | ✓ | ✓ |
| PS2.3 Check and describe results | | | | | ✓ | ✓ |

Note: examination paper columns refer to preparation for the papers.

7

GRADE DESCRIPTIONS

Grade descriptions are provided to give a general indication of the standards of achievement likely to have been shown by candidates awarded particular grades. The descriptions must be interpreted in relation to the content specified by the specification. The grade awarded will depend in practice upon the extent to which the candidate has met the assessment objectives overall. Shortcomings in some aspects of the assessment may be balanced by better performances in others.

Grade F

Candidates show a basic knowledge of familiar, simple information processing and communication applications and of the techniques and systems needed to support them. They show knowledge of some of the basic ICT terms and definitions; respond to needs and opportunities and evaluate ways of addressing these using information and communication systems.

Candidates understand the need for precision in framing questions when finding, selecting and collecting information. They use ICT to explore, develop and interpret information. They develop, test and modify sets of instructions to automate processes and to make things happen and use computer models to detect patterns and relationships.

Candidates use ICT to share, exchange and present work and demonstrate how it contributes to the development of their ideas and reflect on their use of ICT and show some knowledge of its use in the wider world.

Grade C

Candidates show some knowledge and understanding of the range and scope of information processing and communication applications and of the techniques and systems, including the software and hardware sub-systems, needed to support them. They show a good understanding of basic ICT terms and definitions and are able to contrast and compare related ideas.

Candidates identify needs and opportunities and analyse, design and evaluate appropriate ways of addressing these using information and communication systems. They use complex lines of enquiry to find and select information, from a wide range of sources and explore, develop and interpret information to carry out a range of tasks and produce appropriate solutions to problems.

Candidates show awareness of efficiency and economy in developing, testing and refining sets of instructions to automate processes and to make things happen, including responding to external events. They use computer models to investigate and test hypotheses.

Candidates use ICT to share, exchange and present work, demonstrating a consideration of audience and purpose. They show awareness of the need to detect the loss or corruption of information and to prevent the abuse of personal information and reflect critically on their use of ICT and consider the effects of its use in the wider world.

Grade A

Candidates show a good knowledge and understanding of the range and scope of information processing and communication applications and of the techniques and systems, including the software and hardware sub-systems, needed to support them. They use ICT terms and definitions appropriately and are able to contrast and compare related ideas.

Candidates apply general principles of information processing to given situations and abstract general principles from given examples. They identify a range of needs and opportunities, carry out systematic analysis, and design and evaluate effective ways of using information and communication systems. Candidates evaluate information sources, software packages and computer models, analysing the situations for which they were developed and assessing their efficiency, appropriateness and ease of use.

Candidates use complex lines of enquiry to find and select information, using a wide range of sources. They explore, develop and interpret information to carry out a range of tasks and produce effective working solutions to a range of problems, including designing and implementing systems for others to use.

Candidates show efficiency and economy in developing, testing and refining sets of instructions to automate processes and to make things happen, including responding to external events. They use and develop computer models to investigate and test hypotheses.

Candidates use ICT to share, exchange and present work, demonstrating a clear sense of audience and purpose. They discuss methods of detecting the loss or corruption of information and describe steps which can minimise the likelihood of the abuse of personal information and reflect critically on their use of ICT and show understanding of the effects of its use in the wider world.

APPENDIX

EXEMPLIFICATION OF KEY SKILLS

Note: If producing certain types of evidence creates difficulties, due to disability or other factors, the student may be able to use other ways to show achievement. The student should ask the tutor or supervisor for further information. The suggested contexts given below should not be seen as comprehensive, as there will clearly be other opportunities within the course of study for candidates to produce evidence of attainment in Key Skills

COMMUNICATION

| COMMUNICATION: LEVEL 1 | | | |
|---|--|---|--|
| C1.1 TAKE PART IN A DISCUSSION | | | |
| C1.1 Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Take part in a one-to-one discussion and a group discussion about different, straightforward subjects. | <ul style="list-style-type: none"> Provide information that is relevant to the subject and purpose of the discussion; Speak clearly in a way that suits the situation; and Listen and respond appropriately to what others say. | Discussion Records from an assessor who observed each discussion and noted how the student met the requirements of the Unit, or an audio/video tape of the discussions. | Discussion on the benefits and drawbacks of introducing ICT at checkouts (PoS) in supermarkets, from the point of view of the retailer and the customer. |
| C1.2 READ AND OBTAIN INFORMATION | | | |
| C1.2 Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Read and obtain information from two different types of documents about straightforward subjects, including at least one image. | <ul style="list-style-type: none"> Read relevant material; Identify accurately the main points and ideas in material; and Use the information to suit the purpose. | Reading A record of what the student reads and why, including a note or copy of the image. Notes, highlighted text or answers to questions about the material read. Records of how the student used the information. E.g. in discussions for C1.1 or writing for C1.3 . | One document could be a magazine or newspaper article on the use of ICT, the second could be a textbook or worksheet. The image could come from either. The candidate could answer questions on the set topic, or use the information in their coursework. |
| C1.3 WRITE TWO DIFFERENT TYPES OF DOCUMENT | | | |
| C1.3 Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Write two different types of documents about straightforward subjects. Include at least one image in one of the documents. | <ul style="list-style-type: none"> Present relevant information in a form that suits the purpose; Ensure text is legible; and make sure that spelling, punctuation and grammar are accurate so the meaning is clear. | Writing Two different documents might include a letter, a short report or essay, with an image such as a chart or sketch. | The letter could be part of the research for coursework. An essay on the use of ICT in the electronic office, including an imported image or chart, would fulfil the second requirement. |

| COMMUNICATION: LEVEL 2 | | | |
|--|---|--|---|
| C2.1a CONTRIBUTE TO A DISCUSSION | | | |
| C2.1a Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Contribute to a discussion about a straightforward subject. | <ul style="list-style-type: none"> • Make clear and relevant contributions in a way that suits the purpose and situation; • Listen and respond appropriately to what others say; and • Help to move the discussion forward. | <p>Discussion A record from an assessor who observed the discussion and noted how the student met the requirements of the Unit, or an audio/video tape of the discussion.</p> | Discussion on the benefits and drawbacks of introducing ICT at checkouts (PoS) in supermarkets, from the point of view of the retailer and the customer. |
| C2.1b GIVE A SHORT TALK | | | |
| C2.1b Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Give a short talk about a straightforward subject, using an image. | <ul style="list-style-type: none"> • Speak clearly in a way that suits the subject, purpose and situation; • Keep to the subject and structure the talk to help listeners follow what the student says; and • Use an image to illustrate clearly the main points. | <p>Short talk A record from an assessor who observed the talk, or an audio/video tape of the talk.</p> <p>Notes from preparing and giving the talk.</p> <p>A copy of the image used.</p> | A presentation on a topic relevant to the candidate, such as 'how I use ICT each day'. The presentation could use handouts, OHT or PowerPoint. The image could be a chart or diagram prepared by the candidate or a copy of an existing image/picture. |
| C2.2 READ AND SUMMARISE INFORMATION | | | |
| C2.2 Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Read and summarise information from two extended documents about a straightforward subject. One of the documents should include at least one image. | <ul style="list-style-type: none"> • Select and read relevant material; • Identify accurately the lines of reasoning and main points from text and images; and • Summarise the information to suit the purpose. | <p>Reading A record of what is read and why, including a note or copy of the image. Notes, highlighted text or answers to questions about the material read. Evidence of summarising information could include the student's notes for the talk, or one of the documents written.</p> | One document could be an extended magazine, newspaper or web-based article on the use of ICT, the second could be a textbook or user manual. The image could come from either. The candidate could answer questions on the set topic, or use the information in their coursework. |
| C2.3 WRITE DIFFERENT TYPES OF DOCUMENT | | | |
| C2.3 Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Write two different types of documents about straightforward subjects. One piece of writing should be an extended document and include at least one image. | <ul style="list-style-type: none"> • Present relevant information in an appropriate form; • Use a structure and style of writing to suit the purpose; and • Ensure the text is legible and that spelling, punctuation and grammar are accurate, so the meaning is clear. | <p>Writing Two different documents might include a report or an essay, with an image such as a chart, graph or diagram, a business letter or notes.</p> | An essay on the use of ICT in the electronic office would fulfil one requirement. The coursework provides an ideal opportunity for producing an extended report and including generated or imported images. |

APPLICATION OF NUMBER

| APPLICATION OF NUMBER: LEVEL 1 | | | |
|--|--|--|---|
| N1.1 INTERPRET STRAIGHTFORWARD INFORMATION | | | |
| N1.1 Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Interpret straightforward information from two different sources. At least one source should be a table, chart, diagram or line graph. | <ul style="list-style-type: none"> • Obtain the information needed to meet the purpose of the task; and • Identify suitable calculations to get the results needed. | <p>Interpret information Interpret straightforward information from two different sources. At least one source should be a table, chart, diagram or line graph. A statement from an assessor who checked the accuracy of the student's measurements or observations (if this was done). Records of the information obtained and the types of calculations identified to get the results needed.</p> | This could take the form of a worksheet showing the growth in the use of computers over a given time, or the speed of processing, size of memory etc. |
| N1.2 CARRY OUT STRAIGHTFORWARD CALCULATIONS | | | |
| N1.2 Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Carry out straightforward calculations to do with: a. amounts and sizes; b. scales and proportion; c. handling statistics. | <ul style="list-style-type: none"> • Carry out calculations to the levels of accuracy the student has been given; and • Check the results make sense. | <p>Carry out calculations Records of the calculations (for a, b and c) and how the student checked them.</p> | Comparisons of processing power, the relationship between bits and bytes; kilo, mega, giga, and their relationship. |
| N1.3 INTERPRET THE RESULTS OF CALCULATIONS | | | |
| N1.3 Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Interpret the results of the calculations and present her/his findings. The student must use one chart and one diagram. | <ul style="list-style-type: none"> • Choose suitable ways to present findings; • Present findings clearly; and • Describe how the results of the calculations meet the purpose of the task. | <p>Interpret results and present findings Descriptions of the findings and how the results of the calculations met the purpose of the tasks. At least one chart and one diagram presenting the findings.</p> | Assignment to show the increase in computing power of personal computers over the last 15 years, with a chart illustrating the increase in processor speed and/or RAM / hard disc capacity. |

| |
|---------------------------------------|
| APPLICATION OF NUMBER: LEVEL 2 |
|---------------------------------------|

The student must carry through at least one substantial activity that includes straightforward tasks for N2.1, N2.2 and N2.3.

| N2.1 INTERPRET INFORMATION | | | |
|--|---|--|--|
| N2.1 Students must: | Evidence must show that students can: | Example of evidence: | Suggested context - |
| Interpret information from two different sources, including material containing a graph. | <ul style="list-style-type: none"> • Choose how to obtain the information needed to meet the purpose of the activity; • Obtain the relevant information; and • Select appropriate methods to get the results needed. | <p>Interpret information A description of the substantial activity. Copies of source material, including the graph, and/or a statement from someone who has checked the accuracy of the student's measurements and observations. Records of the information obtained and the methods selected for getting the results needed.</p> | The modelling work within the portfolio provides one means of providing evidence in support of this key skill. Candidates could select an appropriate context for their work such as a retail outlet (e.g. school canteen) and investigate the costs/overheads and profits involved. |
| N2.2 CARRY OUT CALCULATIONS | | | |
| N2.2 Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Carry out calculations to do with: a. amounts and sizes; b. scales and proportion; c. handling statistics; d. using formulae. | <ul style="list-style-type: none"> • Carry out calculations, clearly showing methods and levels of accuracy; and • Check methods to identify and correct any errors, and making sure the results make sense. | <p>Carry out calculations Records of calculations (for a, b, c and d), showing methods used and levels of accuracy. Notes on how the student checked methods and results.</p> | Candidates could change data / formulae in the model to investigate effects on profits and loss. |
| N2.3 INTERPRETING THE RESULTS OF CALCULATIONS | | | |
| N2.3 Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Interpret the results of calculations and present findings. The student must use at least one graph, one chart and one diagram. | <ul style="list-style-type: none"> • Select effective ways of presenting findings; • Present findings clearly, describing methods; and • Explain how the results of the calculations meet the purpose of the study. | <p>Interpret results and present findings Descriptions of findings and methods. Notes on how the results from the calculations met the purpose of the activity. At least one graph, one chart and one diagram presenting the findings.</p> | The outcome of the modelling exercise could be presented as a report to the client, illustrating the methodology and findings of the study. |

INFORMATION TECHNOLOGY

| INFORMATION TECHNOLOGY: LEVEL 1 | | | |
|--|--|--|--|
| IT1.1 FINDING, EXPLORING AND DEVELOPING INFORMATION | | | |
| IT1.1 Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Find, explore and develop information for two different purposes. | <ul style="list-style-type: none"> • Find and select relevant information; • Enter and bring in information, using formats that help development; and • Explore and develop information to meet the student's purpose. | <p>Find and develop information</p> <p>Print-outs and copies of the information the student selects to use.</p> <p>A record from an assessor who observed the student using IT when exploring and developing information or working drafts with notes of how the student met the requirements of the Unit.</p> | <p>The internally assessed components have been specifically designed so that one of the purposes can be covered by the portfolio, the second by the project (for candidates following the full course only).</p> <p>Full details of the requirements of these component(s) may be found in section 4.</p> |
| IT1.2 PRESENTING INFORMATION | | | |
| IT1.2 Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Present information for two different purposes. The student's work must include at least one example of text, one example of images, and one example of numbers. | <ul style="list-style-type: none"> • Use appropriate layouts for presenting information in a consistent way; • Develop the presentation so it is accurate, clear and meets the purpose; and • Save information so it can be found easily. | <p>Present information</p> <p>Working drafts showing how the student developed the presentation or records from an assessor who saw the presentation or records from an assessor who saw the student's screen displays.</p> <p>Print-outs or prints of a static or dynamic screen display of the student's final work, including examples of text, images and numbers.</p> <p>Records of how the student saved information.</p> | <p>One of the purposes can be covered by the portfolio, the second by the project, as above.</p> |

| INFORMATION TECHNOLOGY: LEVEL 2 | | | |
|---|--|--|--|
| IT2.1 SEARCHING FOR AND SELECTING INFORMATION | | | |
| IT2.1 Students must: | Evidence must show that students can:- | Examples of evidence: | Suggested context: |
| Search for and select information for two different purposes. | <ul style="list-style-type: none"> Identify the information needed and suitable sources; Carry out effective searches; and Select information that is relevant to the student's purpose. | <p>Search for and select information Print-outs of the relevant information with notes of sources and how the student made searches, or a record from an assessor who observed the student using IT when searching for information.</p> | <p>The internally assessed components have been specifically designed so that one of the purposes can be covered by the portfolio, the second by the project (for candidates following the full course only).</p> <p>Full details of the requirements of these component(s) may be found in section 4.</p> |
| IT2.2 EXPLORING AND DEVELOPING INFORMATION | | | |
| IT2.2 Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Explore and develop information, and derive new information, for two different purposes. | <ul style="list-style-type: none"> Enter and bring together information using formats that help development; Explore information as needed for the purpose; and Develop information and derive new information as appropriate. | <p>Develop information Print-outs, or a record from an assessor who observed the student using IT, with notes to show how the student explored and developed information and derived new information.</p> | <p>One of the purposes can be covered by the portfolio, the second by the project as above.</p> |
| IT2.3 PRESENT COMBINED INFORMATION | | | |
| IT2.3 Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context: |
| Present combined information for two different purposes. The student's work must include at least one example of text, one example of images and one example of numbers. | <ul style="list-style-type: none"> Select and use appropriate layouts for presenting combined information in a consistent way; Develop the presentation to suit the purpose and the types of information; and Ensure the work is accurate, clear and saved appropriately. | <p>Present information Working drafts, or a record from an assessor who observed the screen displays, with notes to show how the student developed content and presentation. Print-outs, or prints of static or dynamic screen displays, of the final work, including examples of text, images and numbers. Records of how the information was saved.</p> | <p>One of the purposes can be covered by the portfolio, the second by the project as above.</p> |

WORKING WITH OTHERS

WORKING WITH OTHERS LEVEL 1

Students must carry through at least:

- **one** straightforward activity in a one-to-one situation;
- **one** straightforward activity in a group situation.

Each activity must include tasks for WO1.1, WO1.2 and WO1.3.

| Students must: | Evidence must show that students can: | Examples of evidence: | Suggested context : |
|---|--|---|--|
| <p>WO1.1 Plan with others what needs to be done to achieve given objectives, and confirm understanding of responsibilities and working arrangements.</p> | <ul style="list-style-type: none"> • Check understanding of the objectives the student has been given for the activity; • Identify what needs to be done to achieve them and suggest ways the student could help; and • Make sure that the student is clear about her/ his responsibilities and working arrangements. | <p>Planning activities Records from an assessor who observed the student's discussions with others or audio/video tapes. Notes of the objectives, responsibilities and working arrangements for each activity.</p> | <p>At this level the teacher might give detailed guidance and objectives to the candidates so that they are clear about what needs to be done to achieve a successful outcome in the portfolio (or project for full GCSE candidates). These discussions could form the basis of the evidence for WO 1.1 in a one-to-one situation.</p> <p>Activity in a group situation may be evidenced from non-board assessed classwork, but to ensure accurate and fair assessment, neither the portfolio or project should be a group submission.</p> |
| <p>WO1.2 Work with others towards achieving the given objectives, carrying out tasks to meet responsibilities.</p> | <ul style="list-style-type: none"> • Carry out tasks to meet responsibilities; • Work safely, and accurately follow the working methods the student has been given; and • Ask for help and offer support to others, when appropriate. | <p>Working towards objectives Records of how the student carried out tasks to meet responsibilities. Notes of the help given and the support the student offered others. These records could include a log, statements written by others with whom the student worked, audio/video tape recordings, photographs with notes and assessor records.</p> | <p>This evidence may be derived from the portfolio or project work, subject to the note above regarding group work.</p> |
| <p>WO1.3 Identify progress and ways of improving work with others to help achieve given objectives.</p> | <ul style="list-style-type: none"> • Identify own and other's opinions on what has gone well and less well in carrying out the activity; • Report any difficulties in meeting own responsibilities and what was done about them; and • Identify ways of improving work with others to help achieve objectives. | <p>Identifying progress Statements from both the student and others on progress (written or recorded). Records of answers to questions from an assessor about any difficulties and what the student did about them. Notes of ways to improve work with others.</p> | <p>Again, this evidence may be derived from the portfolio or project work.</p> |

WORKING WITH OTHERS LEVEL 2

Students must carry through at least:

- **one** straightforward activity in a one-to-one situation;
- **one** straightforward activity in a group situation.

Each activity must include tasks for WO2.1, WO2.2 and WO2.3.

| Students must:- | Evidence must show that students can: | Examples of evidence | Suggested context: |
|--|---|---|--|
| <p>WO2.1 Plan the activity with others, identifying objectives and helping to allocate responsibilities and confirm working arrangements.</p> | <ul style="list-style-type: none"> • Identify the objectives of the activity and what needs to be done to achieve them; • Provide relevant information to help allocate responsibilities; and • Confirm working arrangements with those involved. | <p>Planning activities Records from an assessor who observed the student's discussions with others or audio/video tapes. Note of the information provided, with details of the identified objectives, responsibilities and working arrangements for each activity.</p> | <p>The candidates could discuss objectives and responsibilities with the teacher so that they are clear about what needs to be done to achieve a successful outcome in the portfolio (or project for full GCSE candidates). These discussions could form the basis of the evidence for WO 2.1 in a one-to-one situation.</p> <p>Activity in a group situation may be evidenced from non-board assessed classwork, but to ensure accurate and fair assessment, neither the portfolio or project should be a group submission.</p> |
| <p>WO2.2 Work with others towards achieving the identified objectives, organising tasks to meet responsibilities, and support co-operative working.</p> | <ul style="list-style-type: none"> • Organise own tasks so the student can be effective in meeting responsibilities; • Carry out tasks accurately and safely, using appropriate working methods; and • Support co-operative ways of working, seeking advice from an appropriate person when needed. | <p>Working towards objectives Records of how the student organised and carried out tasks, supported co-operative work and sought advice. These records could include a log, statements written by others with whom the student worked, audio/video tape recordings, photographs with notes and assessor records.</p> | <p>This evidence may be derived from the portfolio or project work, subject to the note above regarding group work.</p> |
| <p>WO2.3 Exchange information on progress and agree ways of improving work with other to help achieve objectives.</p> | <ul style="list-style-type: none"> • Provide information on what has gone well and less well in carrying out the activity, including the quality of work; • Listen and respond appropriately to progress reports from others; and • Agree ways of improving work with others to help achieve objectives. | <p>Exchanging information on progress Statements on progress (written or recorded) including details about the quality of work and how the student responded to other reports on progress. Notes of what the student agreed to do to improve work with others and help achieve objectives.</p> | <p>Again, this evidence may be derived from the portfolio or project work.</p> |

IMPROVING OWN LEARNING AND PERFORMANCE

IMPROVING OWN LEARNING AND PERFORMANCE LEVEL 1

Students must carry through at least:

- **one** example of study-based learning;
- **one** example of activity-based learning.

The whole process must be completed twice.

| Students must: | Evidence must show that students can: | Examples of evidence - | Suggested context: |
|--|--|--|---|
| <p>LP1.1 Confirm understanding of targets and how these will be met, with the person setting them.</p> | <ul style="list-style-type: none"> • Make sure targets clearly show what is wanted to be achieved; • Identify action points and deadlines for each target; and • Make sure the dates for reviewing progress and how to get support needed are known. | <p>Understanding targets Records of discussions which show the student checked her/his understanding of targets and knew how to get the support needed.</p> | <p>Establish with the teacher targets for enhancing performance, such as identifying a topic for one of the portfolio tasks and agreeing a plan of action to complete this.</p> |
| <p>LP1.2 Follow plans, using support given by others to help meet targets.</p> | <ul style="list-style-type: none"> • Work through the action points to complete tasks on time; • Use support and ways of learning given by others to help in the meeting of targets; and • Make changes suggested by the person supervising the student, when needed. | <p>Following plans A log of study-based and activity-based learning, with notes of the support given. Records from those who have seen the work and which shows the tasks were completed on time and how any suggested changes were made.</p> | <p>Follow the above plan to achieve the desired goal, seeking advice when necessary and modifying the plan as appropriate.</p> |
| <p>LP1.3 Review achievements and progress in meeting targets, with help from an appropriate person.</p> | <ul style="list-style-type: none"> • Say what it is thought has gone well and less well, what was learned and ways learning took place; • Identify targets met and evidence of achievements; • Check that the student understood how to improve her/his performance. | <p>Reviewing progress Records of discussions which show what the student said about her/his progress and had checked s/he knew how to improve performance. Examples of work which show the student learned from two study-based and two activity-based activities. Notes on action plans to show targets met.</p> | <p>Review of progress towards completing the task. Discussions how to improve performance, either through modifying the process (e.g. looking for information elsewhere) or activity (e.g. the presentation of the work).</p> <p>The second activity could be drawn from work for the project (for full GCSE candidates).</p> |

IMPROVING OWN LEARNING AND PERFORMANCE LEVEL 2

Students must carry through tasks for LP2.1, LP2.2 and LP2.3 that include at least:

- **one** example of study-based learning;
- **one** example of activity-based learning.

The student must complete this whole process twice and include at least **one** example of working without close supervision and **one** example of using learning from one task to meet the demands of a new situation.

| Students must: | Evidence must show that students can: | Examples of evidence - | Suggested context: |
|---|--|---|---|
| <p>LP2.1 Help set targets with an appropriate person and plan how these will be met.</p> | <ul style="list-style-type: none"> • Provide accurate information to help set realistic targets for achieving what is to be done; • Identify appropriate action points for each target; and • Plan how time will be used effectively to meet targets, including use of support and a date for reviewing progress. | <p>Setting targets Records of discussions which show the information provided to help set targets. Two action plans with action points, timetable and notes of support needed.</p> | <p>Establish with the teacher appropriate targets for enhancing performance, such as identifying a topic for one of the portfolio tasks and agreeing a plan of action to complete this. The plan should take into account time and resources available as well as the candidate's own knowledge, understanding and skill.</p> |
| <p>LP2.2 Use plans, identifying support from others to help meet targets, and take responsibility for some decisions about own learning.</p> | <ul style="list-style-type: none"> • Use personal timetable and action points to help manage time well and complete tasks; • Identify when support is needed and use this effectively to help the meeting of targets; and • Take responsibility for some decisions about own learning, using suitable approaches and methods and make any changes to plans when needed. | <p>Using plans A log of the study-based and activity-based learning, with notes of:</p> <ul style="list-style-type: none"> • When the student asked for support and how it was used; • When and how the student took responsibility for own learning; • How own learning from one task was used to meet the demands of a new situation; • Any changes made to the plan. • Records from those who saw the work which show the student managed her/his time well & completed tasks. | <p>The coursework portfolio and project (for full GCSE candidates only) provide the ideal opportunities to generate this evidence, though it may also draw on specific tasks or assignments which are not assessed by the board.</p> |
| <p>LP2.3 Review progress with an appropriate person and provide examples of evidence of achievements.</p> | <ul style="list-style-type: none"> • Provide information on what has gone well, problems met, what was learned and ways learned; • Identify targets met, and examples of evidence of achievements; and • Identify ways of improving own performance. | <p>Reviewing progress Records of information provided on progress and ways of improving performance. Examples of work which show what was learned from two study-based and two activity-based learning activities. Notes on personal action plans to show targets met.</p> | <p>Again, the coursework portfolio and project provide ideal opportunities to generate this evidence.</p> |

PROBLEM SOLVING

PROBLEM SOLVING LEVEL 1

The student must: carry through a straightforward activity, which includes tasks for PS1.1, PS1.2 and PS1.3, for each of **two** given problems.

| Students must: | Evidence must show that students can: | Examples of evidence - | Suggested context: |
|---|---|---|--|
| <p>PS1.1 Confirm understanding of the given problem and identify at least two options for solving it, with help from an appropriate person.</p> | <ul style="list-style-type: none"> • Check with an appropriate person that the problem is understood, and how to succeed in solving it; • Identify different ways of tackling the problem; • Decide, with help, which options have a realistic chance of success. | <p>Confirm problems and identify options Descriptions of the two problems and how success in solving the problem would be shown. Descriptions of ways for solving the two problems and the most realistic options to try. Records of help given.</p> | <p>The portfolio tasks and (for full GCSE candidates) the project provide ideal opportunities for generation of evidence in support of this key skill.</p> <p>Candidates may be set a problem which can be specifically addressed by one or more of the three portfolio tasks, or by the main project.</p> |
| <p>PS1.2 Plan and try out at least one option for solving the problem, using given evidence and support.</p> | <ul style="list-style-type: none"> • Confirm with an appropriate person the option to be tried for solving the problem; • Plan how to carry out this option; and • Follow through the plan, making use of advice and support given by others to help in the tackling of the problem. | <p>Plan and try out options Statements on how the student confirmed the options to be tried out. A plan for trying out each option. Records of what was done in following the plan, with notes on the advice and support given.</p> | <p>This may involve the project, but at this level one of the three portfolio tasks is adequate, providing it gives the candidate an opportunity to solve a problem. Printouts from the spreadsheet / database / WP package may be used to provide some of the evidence required.</p> |
| <p>PS1.3 Follow given methods to check whether the problem has been solved and describe the results, including ways to improve the approach.</p> | <ul style="list-style-type: none"> • Follow accurately the methods given to check whether the problem has been solved successfully; • Describe clearly the results of the problem solving activity; and • Identify ways of improving the approach to problem solving. | <p>Check and describe results Records of the methods given and how they were used. Descriptions of the results of the problem solving activities and ways to improve the approach to problem solving.</p> | <p>As above. The methods and results would be presented as part of the task. The candidate could then, with help, undertake a summative assessment of the exercise.</p> |

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| PROBLEM SOLVING LEVEL 2 |
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The student must carry through a straightforward activity, which includes tasks for PS2.1, PS2.2 and PS2.3, for each of **two** given problems:

| Students must: | Evidence must show that students can: | Examples of evidence - | Suggested context: |
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| <p>PS2.1 Identify the problem and come up with at least two options for solving it.</p> | <ul style="list-style-type: none"> • Identify with accuracy the main features of the problem and how the student will personally show success in solving it; • Come up with different ways of tackling the problem; and • Decide which options have a realistic chance of success, using help from others when appropriate. | <p>Identify problems and options Descriptions of the two given problems and how the student is going to show they have been solved successfully. Descriptions of ways for solving the two given problems and how these were arrived at. Records of how the student decided which options were most realistic, including the help obtained.</p> | <p>The portfolio tasks and, in particular, the project (for full GCSE candidates) provide ideal opportunities for generation of evidence in support of this key skill.</p> |
| <p>PS2.2 Plan and try out at least one option for solving the problem, obtaining support and making changes to the plan when necessary.</p> | <ul style="list-style-type: none"> • Confirm with an appropriate person the option to be tried for solving the problem, and plan how to carry it out; • Follow the plan, organising the relevant tasks and making changes to the plan when necessary; and • Obtain and effectively use support to help in tackling the problem. | <p>Plan and try out options Statements on how the options were confirmed and tried out. A plan for trying out each option. Records of what was done, including any changes made to the plan. Notes of the support obtained and how this was used effectively.</p> | <p>These requirements would naturally be met in a problem solving situation set within the ICT coursework.</p> <p>Printouts from the spreadsheet / database / WP package may be used to provide some of the evidence required.</p> |
| <p>PS2.3 Apply given methods to check whether the problem has been solved and describe the results and explain the approach, including that to problem solving.</p> | <ul style="list-style-type: none"> • Apply accurately the methods given to check whether the problem has been solved successfully • Describe clearly the results, and explain the decisions taken at each stage of tackling the problem; and • Identify the strengths and weaknesses of the approach to problem solving and describe what would be done differently if a similar problem were met. | <p>Check and describe results Records of the methods used, the results of the checks carried out and explanations of the decisions taken. Descriptions of the strengths and weaknesses of the approach to the problem solving activities, and what would be done differently.</p> | <p>As above. The methods and results would be presented as part of the task. The candidate could then undertake a summative assessment of the whole exercise. In the project, section (d) evaluation, provides opportunities to describe in detail the strengths and weaknesses of the outcome and the approach.</p> |