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General Certificate of Secondary Education

Information and Communication Technology 3521
Specification A
2011

This Specification should be read in conjunction with:

- Specimen and Past Papers and Mark Schemes
- Reports on the Examination
- Teachers' Guide

SPECIFICATION

This specification will be published annually on the AQA Website (www.aqa.org.uk). If there are any changes to the specification centres will be notified in print as well as on the website. The version on the AQA Website, is the definitive one.

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Contents

Background Information

Scheme of Assessment

Subject Content

Key Skills and Other Issues

Centre-Assessed Component

Awarding and Reporting

Appendices

Background Information

1 The Revised General Certificate of Secondary Education

Following a review of the National Curriculum requirements, and the establishment of the National Qualifications Framework, all the unitary awarding bodies have revised their GCSE syllabuses for examination in 2003.

1.1 Changes at GCSE

Key Skills

All GCSE specifications must identify, as appropriate, opportunities for generating evidence on which candidates may be assessed in the "main" Key Skills of communication, application of number and information technology at the appropriate level(s). Also, where appropriate, they must identify opportunities for developing and generating evidence for addressing the "wider" Key Skills of working with others, improving own learning and performance and problem solving.

Spiritual, moral, ethical, social, cultural, environmental, health and safety and European Issues

All specifications must identify ways in which the study of the subject can contribute to an awareness and understanding of these issues.

ICT

The national curriculum requires that students should be given opportunities to apply and develop their ICT capacity through the use of ICT tools to support their learning. In each specification candidates will be required to make effective use of ICT in ways appropriate to the needs of the subject.

	Tiering	In most subjects the scheme of assessment must include question papers, targeted at two tiers of grades, i.e. A* - D and C - G. A safety net of an allowed Grade E will be provided for candidates entered for the higher tier who just fail to achieve Grade D. The questions will still be targeted at A* - D.
	Citizenship	From 2002, students in England will be required to study Citizenship as a national curriculum subject. Each GCSE specification must signpost, where appropriate, opportunities for developing citizenship knowledge, skills and understanding.
1.2	Changes to the ICT Criteria	Specifications that meet the information and communication technology requirements of the National Curriculum Order must use the title Information and Communication Technology. Greater emphasis is placed on the use of Communications Technology. The requirements for achieving success in the specification at grade F and grade C must be demonstrably sufficient to meet the criteria listed in Part B of the IT key skill specifications at levels 1 and 2.

2

Specification at a Glance
Information and Communication Technology A

This is one of two AQA specifications in this subject. There are also two GCSE (Short Courses).

There are two tiers of assessment Foundation (G – C) and Higher (D – A*)

Foundation Tier
3521F
Higher Tier
3521H

GCSE Full Course 3521	
Written Paper	**40% of total marks**
Foundation Tier	1½ hours short answer questions
Higher Tier	1½ hours short and extended answer questions
	All questions will be compulsory
Coursework	
AQA-set Assignment	**30% of total marks**
Description of a situation where appropriate use of ICT will solve some given problems	
Coursework	
Project	**30% of total marks**
Candidates are required to submit a report on the solution to a problem that demonstrates their ICT capabilities. Wherever possible, candidates should select a problem from their own area of interest.	

3 Availability of Assessment Units and Entry Details

3.1	Availability of Assessment Units	Examinations based on this Specification are available in the June examination series only.
3.2	Entry Codes	Normal entry requirements apply, but the following information should be noted. The **Subject Codes** for entry to the GCSE award are: Full Course ICT A: Foundation Tier 3521F Higher Tier 3521H
3.3	Classification Codes	Each specification is assigned to a national classification code, indicating the subject area to which it belongs. 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. The classification code for this specification is 2650.
3.4	Private Candidates	This specification is not available for private candidates. Private candidates should refer to Specification B.
3.5	Access Arrangements and Special Consideration	We have taken note of equality and discrimination legislation and the interests of minority groups in developing and administering this specification. We follow the guidelines in the Joint Council for Qualifications (JCQ) document: *Access Arrangements, Reasonable Adjustments and Special Consideration: General and Vocational Qualifications.* This is published on the JCQ website (**http://www.jcq.org.uk)** or you can follow the link from our website (**http://www.aqa.org.uk)**.
3.6	Language of Examinations	All assessment will be through the medium of English. Assessment materials will not be provided in Welsh or Gaeilge.

Scheme of Assessment

4 Introduction

4.1 National Criteria

This AQA GCSE Specification in Information and Communication Technology complies with the following:

- The GCSE Subject Criteria for Information and Communication Technology;
- The GCSE, GCE and AEA Code of Practice April 2009;
- The GCSE Qualification Specific Criteria;
- The Arrangements for the Statutory Regulation of External Qualifications in England, Wales and Northern Ireland: Common Criteria.

4.2 Rationale

AQA provides centres with choice by offering two alternative specifications in GCSE Information and Communication Technology and in the associated Short Course qualification. The differences between the two specifications lie primarily in the requirements for the coursework component but may also be evident in the teaching and learning approach anticipated for each specification.

The coursework for Specification A consists of an AQA-set Assignment (for the Short Course) plus a Project selected by the candidate (for the Full Course).

For Specification B, candidates are required to complete two tasks for the Full Course (one task for the Short Course) which are to be chosen from two themes stated in the specification. Candidates are able to make their own, free choice of task, from within these themes, which allows them to fulfil the assessment criteria.

Specification A

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

The specification uses a range of assessment techniques to enable candidates to respond graphically and in writing through practical and investigative work. In the final assessment 60% of the marks are based on coursework which allows candidates to experience an appropriate variety of roles relevant to information and communication 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. The remaining 40% of the final assessment will be by a differentiated terminal written examination paper testing Grades C-G or Grades A*-D.

The specification provides a course of study that will enable candidates who achieve the appropriate grades (D-G) or (A*-C) to obtain exemption from Level 1 or 2 Key Skills in Information Technology.

The GCSE (Short Course) Information and Communication Technology Specification A has been produced so that the knowledge, skills and assessment are all included within the full GCSE Information and Communication Technology Specification A.

This should allow centres and candidates the opportunity, if required, to move from one course to the other with minimum disruption.

4.3 Prior level of attainment and recommended prior learning

The GCSE specifications in Information and Communication Technology have been developed to enable students who have followed the National Curriculum ICT programme of study at Key Stage 3 to continue their studies at GCSE level.

4.4 Progression

The specification allows candidates to progress to the GCE Advanced specification in Information and Communication Technology, Advanced Vocational Certificate of Education (VCE) ICT or provides a coherent, satisfying and worthwhile course of study for students who do not progress further in the subject.

5 Aims

The aims set out below describe the educational purposes of following a course in Information and Communication Technology. Some of these aims are reflected in the assessment objectives; others are not because they cannot readily be translated into measurable objectives. All are, however, aims for this Information Technology course. The aims are not listed in order of priority.

A course based on this specification should encourage candidates to:

a. 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 a broad and balanced experience of the range of information and communication systems and their applications and an understanding of their capabilities and limitations.

Through these broad aims, a course based on this specification should:

- develop the competence of candidates through the use of information technology in reasoned ways to solve significant problems using appropriate principles, techniques and equipment effectively and safely;
- develop the capability of candidates through the practical use of information technology for a variety of appropriate purposes in ways which produce effective responses to identified needs and opportunities in the whole curriculum;
- develop the knowledge, concepts and skills which will enable candidates to develop a broad and balanced view on a range of information systems and their applications, an understanding of their capabilities and limitations and an ability to evaluate them critically;
- develop the abilities of candidates, through the appropriate knowledge and concepts, to comment and reflect on the significant legal, political, social, environmental, economic and aesthetic applications, implications and effects of information technology;
- encourage precise and accurate communication skills in a variety of media.

6 Assessment Objectives

6.1 Assessment Objectives

A GCSE specification must require candidates to demonstrate their ability to:

a. apply their knowledge, skills and understanding of ICT to a range of situations;

b. 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;

c. reflect critically on the way they and others use ICT;

d. discuss and review the impact of ICT applications in the wider world;

e. consider the social, economic, political, legal, ethical and moral issues and security needs for data which surround the increasing use of ICT.

Candidates will be assessed on their ability to organise and present information, ideas, descriptions and arguments clearly and logically, taking into account their use of grammar, punctuation and spelling.

6.2 Quality of Written Communication

Where candidates are required to produce extended written material in English, they will be assessed on the quality of written communication. Candidates will be required to:

- present relevant information in a form that suits its purposes;
- ensure that text is legible and that spelling, punctuation and grammar are accurate, so that meaning is clear.

Quality of written communication will be assessed in the project.

7 Scheme of Assessment

7.1 Assessment Units

The Scheme of Assessment comprises three components.

Written Paper	1½ hours
40% of the marks	
Foundation Tier	1½ hours short answer questions
Higher Tier	1½ hours short and extended answer questions

Coursework AQA-set Assignment	
30% of the marks	100 marks
Description of a situation where appropriate use of ICT will solve some given problems	

Coursework Project	
30% of the marks	100 marks
Candidates are required to submit a report on the solution to a problem that demonstrates their ICT capabilities. Wherever possible, candidates should select a problem from their own area of interest.	

7.2 Weighting of Assessment Objectives

The approximate relationship between the relative percentage weighting of the Assessment Objectives (AOs) and the overall Scheme of Assessment is shown in the following table:

Assessment Objectives	**Component Weightings (%)**			**Overall Weighting of AOs (%)**
	Written Paper	**AQA-set Assignment**	**Project**	
a & b	10-20	25-30	25-30	60-80
c, d & e	20-30	0-5	0-5	20-40
Overall Weighting of Units (%)	40	30	30	**100**

Candidates' marks for each assessment unit are scaled to achieve the correct weightings.

Subject Content

8 Summary of Subject Content

8.1 Introduction

The Subject Content of this specification covers the Programme of Study for Key Stage 4 of the National Curriculum Order for Information and Communication Technology (ICT), and subsumes the Programmes of Study for Key Stages 1 to 3. The subject content meets the requirements of the National Criteria for GCSE ICT, and is a useful preparation for courses leading to A-level ICT or Computing or Advanced VCE ICT.

Section A

Tools, Techniques and Systems

The general structure of information systems

System flowcharts

The difference between information and data

Hardware components

Input peripherals

Output peripherals

Storage devices and media

Operating environment

The role of operating systems

Types of operating systems

Data transfer

User interface

Applications software

The function of applications software within the system

The types of applications software used

Database management

Spreadsheets

Charts

Word processing

Desk top publishing

Drawing

Graphics

Web design

Modelling

Evaluation of major hardware and software components of systems

Development of applications software

Networks and communications

E-mail

Evaluation of major hardware and software components of systems

Gathering data

When, where and why different methods of data capture are used

Data logging

Data validation

Storing data

Data structures

The implications of file size for data storage

Security of data

Processing data

Searching and matching

Sorting files

Merging files

The different methods of processing data

Control

Presenting information.

Modelling and simulation.

The system life cycle.

Section B

Information Systems in Society

Communications

The Data Protection Act

Data misuse

Copyright law and anti-hacking legislation

Growth of information and its effects on society

Health and safety

9 Subject Content

Candidates will be expected to have studied the content of all sections in the context of a range of suitable applications and must be able to use their knowledge to solve problems by suggesting and justifying an appropriate information technology solution.

Section A – Tools, Techniques and Systems

9.1	The general structure of information systems	Understand that information systems may be described in terms of inputs, storage, processing, outputs and feedback understand how data flows through a system in these terms.
	System flowcharts	Understand how a systems flowchart is used to describe how data flows through a system.
	The difference between information and data	Understand that data are the raw values input into, stored and processed by information systems and that information is produced together with a context that adds meaning.
9.2	Hardware components	Understand what a range of hardware is capable of and its usefulness in an information system. Details of operation are not required.
	Input peripherals	Input peripherals expected are: • Keyboard, including specialised keyboards • Mouse, touch pad, tracker ball, joystick • Graphics digitiser • Touch sensitive screen • Light pen • Scanner, digital camera for photographs or video • Microphone • Sensor
	Output peripherals	Output peripherals expected are: • Screen (VDU) • Printers (dot-matrix, laser, ink-jet) • Plotters • Speakers • Motors and switched output in control systems.

	Storage devices and media	Storage devices and media expected are: • ROM, RAM • Hard and floppy disks • Magnetic tape • CD-ROM, CD-Recordable (CD-R), CD-Rewriteable (CD-RW) • DVD-ROM, DVD-RAM, DVD Recordable (DVD-R), DVD-Rewriteable (DVD-RW) • Flash memory • Know the difference between them in terms of whether they are volatile or not and their uses.
9.3	Operating environment	
	The role of operating systems	Know that the operating system: provides a means of communication between applications software and the hardware of the computer system manages system resources including memory and allocation of CPU time manages data transfers including transfers to and from peripherals, manages system security.
	Types of operating systems	Show awareness that different operating systems exist and be able to describe the special facilities needed in multi-tasking and multi-user systems. Understand that applications software may be specific to a particular operating system.
9.4	Data transfer	Know that transfer of data files in graphics, text, sound or numeric format is possible between applications, packages and machines. Know that the use of standard file formats makes such transfer easier. (Details of file formats are not required).
9.5	User interface	Understand that interfaces can be command driven, menu driven or graphical. Discuss the advantages and disadvantages of these types of interface for different categories of users. Identify design considerations in developing a user interface for a particular purpose including consistency, positioning of items on the screen, use of colour, use of sound and availability of help.
9.6	Applications software	
	The function of applications software within the system	Know that applications software is designed to carry out user-related tasks.

The types of applications software used.	Know when software is suitable for a given task and understand the purpose of, and have experienced the use of, software covering the facilities and the techniques detailed below: *Note: It is the facilities and processes given that are important and not the individual nature of any of the packages in particular. It is appreciated that some packages may demonstrate the facilities and processes listed in more than one section.*
Database Management	Understand the concepts of files, records and fields including the terminology tables, rows and columns. Software used should allow: • the insertion and deletion of fields • the insertion and deletion of records • tables to be linked together • the editing of information with records • the validation of data on entry • a simple search on one criterion only • a complex search on two or more criteria • the control of content of reports by selection of fields • the control of the format of reports
Spreadsheets	Software used should allow: • text, numbers and formulae to be entered into cells • the insertion and deletion of columns and rows • formatting of cells • editing of entries within cells • replication of cells • the solution of 'what if'… problems
Charts	Software used should allow: • the construction of bar-charts, pie-charts and scatter graphs from tables of data • labels on axes, legends and headings • numbers scales on the axes to be edited

Word processing	Software used should allow: • the movement, copying and deletion of blocks of text • the alteration of margins and spacing • the use of tabulation • left, right, centred and full justification
Mail-merging	Software used should allow: • the automatic production of documents, where each document contains standard text together with personalised information inserted at the same point within each document.
Desk top publishing	Software used should allow: • text and graphics to be imported • text and graphics to be positioned on the page • text to be formatted, including, changes in font type, style, and size
Drawing	Software used should allow : • freehand drawing • use of pre-defined shapes • use of colour • addition of text • colour fills • textured effects • rotation of shapes
Graphics	Software used should allow: • the use of brushes • sections of the picture to be moved or copied, reflected and scaled • images to be imported • addition of text
Web design	Software used should allow: • text and pictures to be imported • the use of table to position text and graphics • hyperlinks to be created from text and graphics • hot spots to be placed over parts of pictures

	Modelling	Software used should allow: an investigation involving changing variables. Examples of packages are: • a spreadsheet for financial modelling; • a city planning and development program; • a simple flight simulator.
9.7	Development of applications software	Understand that application software: • is written in a computer language, • can be configured to suit the particular preferences of users, • can be customised by altering the coding, • can be written to meet the specific needs of a user.
9.8	Networks and communications	Understand the difference between local area networks (LANs) and wide area networks (WANs). Discuss the advantages and disadvantages of use of networks as compared to stand-alone systems. Show awareness that a modem is required where telephone lines are used in communications systems. (Details of modulation are not required.) Know about the advantages and disadvantages of ISDN compared to the use of modems.
	E-mail	Know about electronic mail, the facilities it has to offer, its use, advantages and disadvantages compared to fax, telephone and post.
9.9	Evaluation of major hardware and software components of systems	Explain why particular hardware and software is appropriate for a particular task. Develop criteria for evaluating hardware and software.
9.10	Gathering data	
	When, where and why different methods of data capture are used	Understand the use of questionnaires, data capture forms, data logging, feedback, OMR, OCR, MICR, bar codes, and magnetic strips in gathering data.

Data logging	Know there is a range of sensors, which can be used to collect data. Show awareness that sensors can be calibrated to a known scale before use. Understand that data can be collected over long or short periods and that the logging interval can also be long or short. Know that data can be collected over short distances or over long distances. Understand that the data collected is stored and can be processed at a later stage.
Data validation	Know the reason for data validation Know the following validation checks; range check, presence check, check digit, data type check, parity check and the type of errors each will detect and where they will be used.

9.11 Storing data

Data structures	Understand the concept of a database as a collection of stored data organised into files or data tables. Understand the nature and purpose of key fields. Understand how linking data tables can reduce the duplication of data making it easier to keep up to date and increasing the consistency of the data. Understand that data can be extracted from a database to produce many different reports and that data from different files in a database can be used to produce a single report.
The implications of file size for data storage	Know that fields can be of different types and of fixed or variable lengths. Know the advantages and disadvantages of using fixed and variable length fields. Understand that files can be very large and that large files require a large backing store. Know that file compression can be used to reduce the size of some files but that these files have to be expanded before use. Know how encoding data in a suitable format affects file size and ease of data retrieval.

9.12	Security of data	Understand the physical precautions needed to protect media including protection from heat, magnetic fields, and water. Understand the need to restrict physical access to terminals and buildings. Describe the file generation back up system and the use of file dumps and transaction log files for backup of on-line systems. Understand the use of passwords to prevent unauthorised access to data Show awareness of the use of encryption to prevent use of stolen data.
9.13	Processing data	
	Searching and matching	Understand the nature of the logical operators AND, OR and NOT as used in construction of database queries and filters.
	Sorting files	Know that the order of records depends on which order fields are chosen for sorting. Understand the importance of sorting a transaction file before merging with a master file.
	Merging files	Understand that merging can be simple such as appending one file onto another provided that both contain the same set of fields. Understand that updating a master file requires a new file to be created from the merging of a transaction file with a current master file.
	The different methods of processing data	Describe batch, real time, interactive and transaction processing and understand when the use of each is appropriate.
	Control	Understand that data acquired from sensors can be used to control devices and appreciate the importance of feedback in such systems. Write or interpret simple control programs from a given instruction set *e.g. Logo*
9.14	Presenting information	Know that information can be presented on screen, as hard copy and in multi-media presentations and understand the need to select an appropriate presentation for a given application and audience. Understand that such presentations can include sound, text, pictures, graphs and charts.

9.15	Modelling and simulation	Understand that a computer model is based on rules and that accuracy of the results produced is dependent on the extent to which the rules are true. Show awareness of the use of spreadsheets for financial modelling. Understand that realistic simulators such as flight simulators and virtual reality software also rely on rules built into the controlling software. *Candidates will be expected to have had practical experience of the use of modelling software.*
9.16	The system life cycle	Describe the steps involved in analysis, design implementation and testing of a system. Understand the nature and purpose of feasibility studies, and the use of interviews, questionnaires and observation in analysis of existing or new systems. Understand the principles of top-down design of systems and be able to identify the subsystems required. Understand the purpose and nature of evaluation criteria. Show awareness that there may be more than one way of implementing a particular system and be able to discuss the advantages and disadvantages of alternative methods. Understand the nature and purpose of a testing plan and be aware that testing must include typical, extreme and erroneous data. Describe the nature and purpose of documentation, which should be provided with a system.

Section B – Information Systems in Society

9.17	Communications	Understand that data can be transmitted rapidly on a global basis. Understand the existence of global networks such as the Internet and the opportunities and problems presented by the use of such networks. Understand the use of web pages and search engines. Know the effects and implications of: • E-commerce, including the secure transfer of data • The use of on-line booking services

		• Global information and communication technology services. The following example is given to clarify what is meant by a global information and communication technology service: secretarial service; any other ICT service that can be undertaken with the supplier and customer in different countries is also covered • The integration of digital television, web browsers, mobile telephones, digital cameras.
9.18	The Data Protection Act	Know the provisions of the 1998 Data Protection Act. Know that there is a requirement to register. Know the responsibilities of data users. Know the rights of data subjects. Know what are the full and partial exemptions to the act and their effects.
9.19	Data misuse	Understand why electronically stored personal information is potentially easier to misuse than that kept in conventional form. Understand the effects of inaccurate data in files of personal information.
9.20	Copyright law and anti-hacking legislation	Show awareness that software cannot be copied without permission. Know of the consequences of software piracy. Show awareness of computer hacking and understand that it can lead to accidental or deliberate corruption of data.
9.21	Growth of information and its effects on society	Describe the use of information technology, and compare it with other methods. Understand that personal information may be held on computer, which is of interest to individuals and their families. Understand the impact of information technology on the lives of members of the community. Discuss the environmental, ethical, moral and social issues raised by information technology.
9.22	Health and safety	Know that using a computer for a long time can affect people's health. Know what steps can be taken to help alleviate stress, eye strain, or wrist, back and neck problems, when using a computer for long periods. Know that there are regulations covering the use of computers in business and commerce to prevent injury to the users.

Key Skills and Other Issues

10 Key Skills – Teaching, Developing and Providing Opportunities for Generating Evidence

10.1 Introduction

The Key Skills Qualification requires candidates to demonstrate levels of achievement in the Key Skills of *Application of Number, Communication* and *Information Technology*.

The units for the 'wider' Key Skills of *Improving own Learning and Performance, Working with Others* and *Problem-Solving* are also available. The acquisition and demonstration of ability in these 'wider' Key Skills is deemed highly desirable for all candidates, but they do not form part of the Key Skills Qualification.

Copies of the Key Skills Units may be down loaded from the QCA web site (www.qca.org.uk/keyskills).

The units for each Key Skill comprise three sections:

A What you need to know.

B What you must do.

C Guidance.

Candidates following a course of study based on this specification for Information and Communication Technology can be offered opportunities to develop and generate evidence of attainment in aspects of the Key Skills of *Communication, Application of Number Information Technology, Improving own Learning and Performance, Working with Others and Problem-Solving*. Areas of study and learning that can be used to encourage the acquisition and use of Key Skills, and to provide opportunities to generate evidence for Part B of the units, are signposted below.

Exemptions for the Key Skills Qualification

GCSE Full Course ICT and Information Technology

GCSE A* - C performance provides full exemption from the Key Skill of IT at level 2.

GCSE D - G performance provides full exemption from the Key Skill of IT at level 1.

10.2 Key Skills Opportunities in ICT Specification A

Communication Level 1

What you must do …	Signposting of Opportunities for Generating Evidence in Subject Content			
	Section A	Section B	Assignment	Project
C1.1 Take part in discussions	✓	✓		
C1.2 Read and obtain information	✓	✓	✓	✓
C1.3 Write different types of documents	✓	✓	✓	✓

Communication Level 2

What you must do …	Signposting of Opportunities for Generating Evidence in Subject Content			
	Section A	Section B	Assignment	Project
C2.1a Contribute to discussions	✓	✓		✓
C2.1b Give a short talk	✓	✓		✓
C2.2 Read and summarise information	✓	✓	✓	✓
C2.3 Write different types of documents	✓	✓	✓	✓

Application of Number Level 1

What you must do …	Signposting of Opportunities for Generating Evidence in Subject Content			
	Section A	**Section B**	**Assignment**	**Project**
N1.1 Interpret information from different sources	✓		✓	✓
N1.2 Carry out calculations	✓		✓	✓
N1.3 Interpret results and present findings	✓		✓	✓

Application of Number Level 2

What you must do …	Signposting of Opportunities for Generating Evidence in Subject Content			
	Section A	**Section B**	**Assignment**	**Project**
N2.1 Interpret information from different sources	✓		✓	✓
N2.2 Carry out calculations	✓		✓	✓
N2.3 Interpret results and present findings	✓		✓	✓

Information Technology Level 1

What you must do …	Signposting of Opportunities for Generating Evidence in Subject Content			
	Section A	**Section B**	**Assignment**	**Project**
IT1.1 Find, explore and develop information	✓	✓	✓	✓
IT1.2 Present information, including text, numbers and images	✓	✓	✓	✓

Information Technology Level 2

What you must do …	Signposting of Opportunities for Generating Evidence in Subject Content			
	Section A	Section B	Assignment	Project
IT2.1 Search for and select information	✓	✓	✓	✓
IT2.2 Explore and develop information and derive new information	✓	✓	✓	✓
IT2.3 Present combined information, including text, numbers and images	✓	✓	✓	✓

Improving own Learning and Performance Level 1

What you must do …	Signposting of Opportunities for Generating Evidence in Subject Content			
	Section A	Section B	Assignment	Project
LP1.1 Confirm short-term targets and plan how these will be met	✓	✓		✓
LP1.2 Follow plan to meet targets and improve performance	✓	✓		✓
LP1.3 Review progress and achievements	✓	✓		✓

Improving Own Learning and Performance Level 2

What you must do …	Signposting of Opportunities for Generating Evidence in Subject Content			
	Section A	Section B	Assignment	Project
LP2.1 Help set short-term targets and plan how these will be met	✓	✓		✓
LP2.2 Use plan and support from others, to meet targets	✓	✓		✓
LP2.3 Review progress and identify evidence of achievements	✓	✓		✓

Problem Solving Level 1

What you must do …	Signposting of Opportunities for Generating Evidence in Subject Content			
	Section A	**Section B**	**Assignment**	**Project**
PS1.1 Confirm understanding of given problems	✓		✓	✓
PS1.2 Plan and try out ways of solving problems	✓		✓	✓
PS1.3 Check if problems have been solved and describe the results	✓		✓	✓

Problem Solving Level 2

What you must do …	Signposting of Opportunities for Generating Evidence in Subject Content			
	Section A	**Section B**	**Assignment**	**Project**
PS2.1 Identify problems and come up with ways of solving them	✓		✓	✓
PS2.2 Plan and try out options	✓		✓	✓
PS2.3 Apply given methods to check if problems have been solved and describe the results	✓		✓	✓

Working with Others Level 1

What you must do …	Signposting of Opportunities for Generating Evidence in Subject Content			
	Section A	**Section B**	**Assignment**	**Project**
WO1.1 Confirm what needs to be done and who is to do it	✓			✓
WO1.2 Work towards agreed objectives	✓			✓
WO1.3 Identify progress and suggest improvements	✓			✓

Working with Others Level 2

What you must do …	Signposting of Opportunities for Generating Evidence in Subject Content			
	Section A	**Section B**	**Assignment**	**Project**
WO2.1 Plan work and confirm working arrangements	✓			✓
WO2.2 Work co-operatively towards achieving identified objectives	✓			✓
WO2.3 Exchange information on progress and agree ways of improving work with others	✓			✓

10.3 Further Guidance

More specific guidance and examples of tasks that can provide evidence of single Key Skills, or composite tasks that can provide evidence of more than one Key Skill are given in the AQA specification support material, particularly the Teachers' Guide.

11 Spiritual, Moral, Ethical, Social, Cultural and Other Issues

11.1	Spiritual, Moral, Ethical, Social, Cultural and Other Issues	The study of Information and Communication Technology can contribute to candidates' understanding of spiritual, moral, ethical, social and cultural issues. The specification provides opportunities for candidates to explore a wide range of these issues through their study of the Subject Content. Social impacts and moral and ethical issues can be found specifically in Section B (see pages 23-4).
11.2	European Dimension	AQA has taken account of the 1988 Resolution of the Council of the European Community in preparing this specification and associated specimen papers.
11.3	Environmental Issues	AQA has taken account of the 1988 Resolution of the Council of the European Community and the Report *"Environmental Responsibility: An Agenda for Further and Higher Education"* 1993 in preparing this specification and associated specimen papers.
11.4	Citizenship	Questions of social and moral responsibilities are clearly relevant to issues involving information and communication technology. In addition, candidates may develop their knowledge and understanding of rights, responsibilities and the roles of voluntary and statutory bodies.
11.5	Avoidance of Bias	AQA has taken great care in the preparation of this specification and associated specimen papers to avoid bias of any kind.
11.6	Health and Safety	Issues of health and safety will occur naturally within the specification. Candidates should be aware of issues affecting the safe use of equipment when dealing with hardware, interfaces and networks and, more specifically, in the safe use of equipment when undertaking coursework tasks.

Centre-Assessed Component

12 Nature of the Centre-Assessed Component

12.1 Introduction

The coursework will comprise 60% of the examination and will consist of an AQA-set Assignment (30%) and a project (30%).

The AQA-set Assignment can be ordered by centres at the start of the course. An order form will be provided to centres before the course commences. It is, therefore, of the utmost importance that centres notify AQA at the earliest opportunity of their intention to enter candidates.

12.2 Nature of the assignment

The AQA-set Assignment will consist of a Candidate Booklet providing the description of a situation where the appropriate use of information technology will solve some problems to be identified. The candidate is required to produce a report that will demonstrate his/her ability to identify requirements, and make appropriate use of information technology in providing solutions which he/she will design, implement, test and evaluate.

Confidential Instructions

The centre will be provided with a set of Confidential Instructions that provide guidance on the identification of the tasks, the marking of the tasks and general solutions. A resource disk and/or CD-ROM will be provided with the appropriate data files for the particular assignment along with the necessary Record Cards.

Mark Scheme

The centre will mark the work using a mark scheme that will be provided as part of the confidential instructions. Marks will be awarded for analysis, design, implementation, testing, and evaluation. The balance of marks in these sections may vary slightly from year to year. At least 60% of the assignment mark will be awarded for design and implementation.

Work to be produced

In this individual assignment, candidates will be expected to study the material supplied and produce work that will demonstrate their ability to:

- analyse a situation and decide on the tasks which will need to be completed
- specify the outputs required
- consider and describe alternative ways of solving problems
- choose the best solution with regard to the requirements of the user and other factors which will be present in the material
- develop success criteria for the solution to each task identified
- develop performance criteria for the whole solution
- design solutions and select the best for the purpose of the assignment
- design testing plans for the solution
- review, and possibly improve, the analysis in the light of the experience gained during the design process
- choose and justify the choice of appropriate information systems, software tools and hardware to address the task
- produce an implementation of the tasks identified
- annotate the implementation sufficiently well to allow the work to be judged against the marking criteria
- test the solution according to the designed testing plan
- modify any of the previous stages as a result of this testing
- evaluate the effectiveness of the solution as a whole and of the tasks identified against the performance criteria and success criteria

Evidence

The work must provide evidence in such a form that it can be judged against the criteria given in the marking scheme.

The evidence which makes up the account may take a variety of forms: initial sketches and drawings, written explanation and commentary, hard copy, etc. Computer disks must **not** be submitted.

Role of the teacher

The teacher will need to review regularly the progress of the assignment with the candidate to ensure that all the assessment objectives for the assignment are met. The teacher's role in the consultative process is to ensure that the form and content of the assignment meet the syllabus requirements. It is not the role of the teacher to comment on matters of detail, to correct, to assist with the solution, or to set agendas of questions for the candidates to follow.

The work must clearly be that of the individual candidate. Group assignments are not permissible.

12.3 Nature of the project

Candidates will be required to submit a report on an investigation into a problem and the implementation of its solution. The problem should be of a realistic nature and be either a single complex problem or a complex problem comprising a number of individual facets. The problem should not be something requiring a single one-off solution but should ideally comprise a re-usable system. The project work should demonstrate the candidate's information technology capability. The subject matter may be drawn from any curriculum area or from any area of interest to the candidate. The form and content of the project will, therefore, be very varied but must be broad enough to demonstrate the following objectives:

a. determine whether the use of an information system is appropriate in a given context;

b. identify a desired outcome and derive the corresponding information requirements;

c. determine what parts of the solution could be re-usable over time;

d. specify a system precisely in terms of the required output, necessary input, the processing required, stored information and any necessary feedback;

e. break down what has to be done into a manageable set of tasks

f. identify suitable methods of interaction with a system;

g. choose and justify appropriate information systems, software tools and techniques to address the tasks;

h. design the system including suitable methods of interaction as identified in f, together with plans for testing the system;

i. produce an implementation of the solution;

j. test and evaluate the effectiveness of the solution;

k. refine the solution as necessary;

l. communicate the solution in appropriate ways.

The evidence which makes up the account may take a variety of forms: initial sketches and drawings, written explanation and commentary, hard copy, etc. Computer disks must **not** be submitted.

The process of choosing a project should be one of negotiation between the candidate and the teacher. The teacher should help the candidate to make a sensible choice of project bearing in mind the abilities, interests and anticipated level of achievement of the individual candidate as well as the resources and time available.

13 Guidance on Setting the Centre-Assessed Component

13.1 AQA-set Assignment

The AQA-set Assignment will be provided by AQA at the start of the two year course. Centres will be sent an order form prior to the commencement of the course that should be completed and returned to the Publications Department. Centres will be provided with sufficient Candidates Booklets on the basis of one per candidate, two copies of the Confidential Instructions and a data disk(s) and/or CD-ROM containing the necessary files to be used.

13.2 Project Guidelines

Centres new to AQA should find the following information useful in helping to understand what type of project will meet the criteria. For the project, centres are encouraged to allow their candidates to follow their own individual ideas, under guidance, rather than set one problem for everyone.

Selection of problem

Candidates who see a single all encompassing solution to their problem and then follow this through without going beneath the surface, are very unlikely to meet the requirements of the criteria. To gain high marks a candidate will need to demonstrate an understanding and consideration of the underlying details of a problem and so be able to break it down into sub-problems. Problems that seem trivial can soon become complex. For example 'Producing a specialist magazine' could give rise to considering membership lists, membership subscriptions, membership cards, accounts as well as magazine style, layouts, title and logo, templates for future use, transfer of data from reporters' computers to DTP computer and so on. The solution in this case becomes complex because of the increase in breadth of the project and the inter-relationship between the parts.

It will also be possible to investigate problems where the underlying details and sub-problems arise because of the depth necessary to produce a solution. For example producing an effective flight simulator or a computer system to run the school library efficiently may be such problems. In these types of situations identifying the desired outcomes and the performance criteria should be interpreted as requiring a full and formal system specification. In this case testing plans should be written specifically to test system specifications that should be carried out and the system evaluated using these results. Marks for this evaluation can be awarded in the testing section rather than the evaluation section. Marks in the evaluation section will then be given for discussion on whether the working system meets the requirements of the client, i.e. was the system specification correct in the first place? The User Guide would also need to contain maintenance documentation. It should also be noted that marks for designing and producing prototypes can be awarded respectively in the design section and the implementation section.

Desired outcomes of a generally identified nature could be a well-published swimming club magazine 'mailed' to the correct people, a logo that clearly identifies the swimming club, well-kept accounts, well-publicised events and an easy to use method of scoring a swimming match. In writing performance criteria it is not only what will be measured, but does it make it easier to score the match? Does the poster attract more people? Are the accounts more accurate? It is also about giving thought to how outcomes will be measured.

Design

In the design section, choices should be made and reasons given for the methods of solutions. Designs should provide evidence of the thinking that has gone on in working towards a solution. Alternative designs and evidence of development are important whether they are logo designs, page layouts or designs for spreadsheets and databases. Where the solution links different aspects, designs for these links should be given. For example, showing that data will be transferred from one application to another using CSV files or that an integrated package will be used to mail merge taking data from the database into the word processor. These link designs may well be best done using diagrams. Designs for testing plans should not only show what is to be tested but should also show how it will be carried out. For example, testing that the query designed to find all firms in the U.K. does find all such firms even if they have been mis-typed in the database as U.K, UK or U.K. will be carried out by typing in the following data, *data items*, applying the query which should give the following results, *expected results list*.

At this stage it is a good idea for centres to pre-mark the work of candidates before they embark on the implementation stages. This will enable them to check that the project will meet the requirements of the criteria and is feasible. Any marks given to candidates at this point are, of course, for their benefit and will not necessarily be the marks sent to the Board.

Implementation

Implementation should follow the earlier design. Enough evidence should be provided to show that the solution has been implemented. Though this may require, for example, the printout of a full database and the full result of searches these need not all be in the required presentation format. In the case of a database it may be that what is actually required is a number of mail-merged letters sent to a restricted set of people; evidence would be a copy of the template letter, one or two merged letters and the complete database and filtered set printed in a compact tabular form.

Testing

Testing needs to follow the testing plans set out in the design section and will take a variety of forms depending on the type of work being done. For example does text flow correctly in the frames on a page template? Do the formulae on a spreadsheet produce the correct results for a set of test data? Does the database deal correctly with typical, critical and erroneous data? Are the search results right? There should be evidence that the tests have been carried out and that comparisons between expected results and actual results are presented. Where necessary, changes should be made in the light of the test results.

	Evaluation	The evaluation section should give a brief overview of the solution as a whole using the performance criteria set out previously based on some actual measurement. Did the poster on the wall attract more people than other notices? How much more quickly can details of particular people be found? What is now possible that was not before?
	User guide	The User Guide should explain to someone how to use the system constructed. It should **not** be a guide to using commercial software. In considering the re-usability of the system it should be noted that not all aspects of the problem need to be dealt with in the User Guide. For example a logo is produced once and for all and it would not be expected that the User Guide should contain details on how someone should go about producing another logo. The logo could appear on all future stationery, for example membership cards. Details of how names, membership numbers, etc. are transferred from a member's database onto the membership cards does however form part of a re-usable system, and how this is achieved should appear in the User Guide.
13.3	Project development	The teacher will need to review regularly the progress of the project with the candidate to ensure that all the assessment objectives for the project are met. The teacher's role in the consultative process is to ensure that the form and content of the project meet the syllabus requirements. It is not the role of the teacher to comment on matters of detail, to correct, to assist with the solution, or to set agendas of questions for the candidates to follow. The work must clearly be that of the individual candidate. Group projects are **not** permissible.
13.4	Coursework Advisers	Coursework Advisers will be available to assist centres with any matters relating to coursework. Details will be provided when AQA knows which centres are following the specification.

14 Assessment Criteria

14.1 Introduction

The coursework consists of an AQA-set assignment (30%) and a project (30%). The assignment is assessed out of a mark of 100 and the project out of 100.

The weighting of the criteria for the assignment may change from year to year depending of the nature of the assignment. However, the criteria descriptions are standard. The criteria for the assignment and the project are given below.

14.2 Criteria

It is necessary to provide a structure for the assessment of coursework so that all teachers are, in general, following a common procedure. Such a procedure will assist with the standardisation of assessment from centre to centre. In assessing candidates, centres must ensure that comparable standards are observed between different teaching groups. Each centre must produce a single order of merit for the centre as whole for each component.

14.3 Criteria for marking the Assignment

This is an example and may be modified slightly to reflect the nature of the actual assignment.

Analysis (10 marks)

Marks	
9-10	Identified the problem and stated the form the output will take, all of the information to be output and all of the data needed to produce the output. Listed all desired outcomes/performance criteria.
7-8	Identified the problem and stated the form the output will take, most of the information to be output and majority of the data needed to produce the output. Listed most desired outcomes/performance criteria.
5-6	Identified the problem and stated a form the output will take, some of the information to be output and some of the data needed to produce the output. Listed some desired outcomes/performance criteria.
3-4	Identified the problem and listed a few aspects of the problem. Listed very few desired outcomes/performance criteria.
1-2	Listed only a few aspects of the problem.
0	Analysis not tackled.

Design (25 marks)

Marks	
21-25	Developed a good planned design, appropriate to the needs of the user, showing how the problem is to be solved. Explained in detail the design choices made, showing how the design meets the needs of the user. Produced a clear justification of the software to be used. The justification is focused on the requirements of the solution.
16-20	Developed a planned design, with some consideration of the needs of the user, showing how the problem is to be solved. Explained the design choices made. Produced a description of the reason why the software to be used is suitable. Most of the description directly relates to the requirements of the solution.
11-15	Developed a design showing how the problem is to be solved. Some explanation of the choices made is given. Produced a list of the features of the software that make it suitable to use in solving the problem. Some of the list directly relates to the requirements of the solution.
6-10	Produced a limited design, with an attempt to show how the problem is to be solved. Produced a limited list of the features of the software that make it suitable to use in solving the problem.
1-5	Produced a limited design, with a limited attempt to show how the problem is to be solved.
0	Design not tackled.

Implementation (45 marks)

Marks	
37-45	Used the resources and techniques with a good level of skill, understanding and efficiency. Produced all, or nearly all, of the evidence of the solution including earlier versions. Implemented all, or nearly all, changes resulting from required testing or judgement. Work is effectively annotated.
28-36	Used the resources and techniques with good skill, some understanding and reasonable efficiency. Produced most of the evidence of the solution including earlier versions. Implemented a number of changes resulting from required testing or judgement. Work is mostly annotated.
19-27	Used the resources and techniques with some skill and some understanding. Produced some evidence of the solution, including earlier versions. Implemented a few changes resulting from required testing or judgement. Some annotation is present.
10-18	Used the resources and techniques with limited skill and limited understanding. Produced limited evidence of the solution, including, at least, one earlier version. Limited annotation is present.
1-9	Used the resources and techniques with very limited skill and very limited understanding. Produced very limited evidence of a solution.
0	Implementation not tackled.

Testing (10 marks)

Marks	
9-10	Identified whether testing is needed or not. A complete or nearly complete testing plan is designed. Identified all or nearly all data used to check the problem. Identified all or nearly all expected results. Tested against the testing plan producing a comprehensive record of results. Described changes needed (if any).
7-8	Identified whether testing is needed or not. A reasonable testing plan is designed. Identified some data used to check the problem. Identified some expected results. Tested against the testing plan in most cases producing a record of results. Described most changes needed (if any).
5-6	Identified whether testing is needed or not. A limited testing plan is designed. Identified a limited amount of data used to check the problem. Identified limited expected results. Attempted to test against the testing plan producing a record of some results. Described some changes needed (if any).
3-4	Identified whether testing is needed or not. Made a limited attempt to test.
1-2	Identified whether testing is needed or not. Made a very limited attempt to test.
0	Testing not tackled.

Evaluation (10 marks)

Marks	
9-10	Presented an evaluation clearly discussing the effectiveness of the solution with complete reference to the desired outcomes/performance criteria.
7-8	Presented an evaluation describing the effectiveness of the solution with reasonable reference to the desired outcomes/performance criteria.
5-6	Presented an evaluation making some reference to the desired outcomes/performance criteria.
3-4	Presented a limited evaluation making limited reference to the desired outcomes/performance criteria.
1-2	Listed methods used.
0	Evaluation not tackled.

14.4 Criteria for marking the Project

Some judgement will be necessary in fitting candidates into the appropriate mark bands. As well as the mark bands given for the individual sections, there are mark bands provided as a check on the final total. The criteria detailed below are arranged in a grid format on the *Candidate Internal Assessment Form* (see Appendix B). Completion of the *Candidate Internal Assessment Form* should provide the basis for the final decision.

Analysis (15 marks)

Marks	
13-15	Produced a detailed description of the problem, clearly describing appropriate sub-problems and the links between them. Identified and evaluated more than one possible way of tackling the problem. Has clearly and appropriately recognised which ways will lead to aspects re-usable over time. Has clearly and in detail identified the desired outcomes and the performance criteria to be used in evaluating the solution. Presentation is of a high quality and uses a wide range of specialist terms. Spelling, punctuation and grammar are consistently accurate.
10-12	Produced a reasonable description of the problem, stating sub-problems and the links between them. Identified and described more than one way of tackling the problem. Has sensibly recognised some ways which will lead to aspects re-usable over time. Stated in reasonable detail the desired outcomes which are usable as performance criteria in evaluating the solution. Presentation is of a good quality and uses a range of specialist terms. Spelling, punctuation and grammar are generally accurate.
7-9	Produced a description of various aspects of the problem. Identified and described a way of tackling the problem, including reusability. Stated some desired outcomes which are not entirely usable as performance criteria in evaluating the solution. Presentation is of average quality. Some specialist terms have been used. Spelling, punctuation and grammar are reasonably accurate.
4-6	Listed some aspects of the problem. Identified a way of tackling the problem. Stated some desired outcomes. Presentation is fair. A limited attempt at specialist terms has been made. Spelling, punctuation and grammar are mostly accurate.
1-3	Listed an aspect of the problem. Presentation is poor. Little, if any, attempt has been made to use specialist terms. Spelling, punctuation and grammar are basic.
0	No analysis is presented.

Design (20 marks)

Marks	
17-20	Correctly identified the information requirements and has chosen with clear justification appropriate systems, tools and/or techniques to solve the problem. Developed a good, planned and creative design for the solution and has clearly described, using appropriate terminology, the relationship between all the various parts of the solution. The description clearly and fully shows which parts can be re-used and how. Produced clear, detailed, and full testing plans of the design.
13-16	Correctly identified the information requirements and has chosen with some justification appropriate systems, tools and/or techniques to solve the problem. Developed a planned design for the solution and has described using appropriate terminology the relationship between the essential parts of the solution. The description reasonably shows which parts can be re-used and how. Produced reasonable testing plans of the design.
9-12	Identified some information requirements and has listed some reasons for a choice of systems, tools and/or techniques used. Developed a design for the solution and has described using some appropriate terminology the relationship between some parts of the solution including reusability. Produced some testing plans of the design.
5-8	Stated an information requirement and has listed a choice of systems, tools and/or techniques. Outlined a design of the solution and has described various parts of the solution with some attempt at linking them. Described some testing which is needed, with partial planning.
1-4	Listed systems tools and/or techniques. Produced a limited design of the solution showing some stages.
0	No design presented.

Implementation (35 marks)

Marks	
29-35	Used appropriate resources and techniques with a good level of skill, understanding and efficiency. Produced the necessary evidence in an appropriate form that can easily be verified and interpreted as a solution to the problem. Carried out fully, or nearly fully any modifications needed (if any) as a result of testing.
22-28	Used appropriate resources and techniques with skill, partial understanding and reasonable efficiency. Produced most of the necessary evidence in an appropriate form that can be verified and interpreted as a solution to the problem. Carried out modifications needed (if any) as a result of testing.
15-21	Used the resources and techniques with some skill, and understanding. Produced some of the necessary evidence in an appropriate form that can be verified and interpreted as a solution to the problem. Carried out some modifications needed (if any) as a result of testing.
8-14	Used the resources and techniques with limited skill, and understanding. Produced some evidence in a form that can be verified and interpreted as a solution to the problem.
1-7	Used the resources and techniques with limited skill.
0	No implementation undertaken.

Testing (15 marks)

Marks	
13-15	Followed the testing plans in a comprehensive manner producing a record of results. Evaluated the results against expectations and determined any modifications to be made.
10-12	Followed the testing plan, testing most cases, producing a record of results. Compared the results against expectations and described most modifications needed (if any).
7-9	Tested the designs with some reference to plans. Testing limited to some specific cases, producing a record of results. Some comparison of results against expectations carried out and some modifications described.
4-6	Some testing carried out. Produced a limited list of modifications (if any).
1-3	Attempted to test the design. Produce a limited list of changes (if any).
0	No testing attempted.

Evaluation (5 marks)

Marks	
5	Presented a high quality evaluation clearly discussing the effectiveness of the solution with complete reference to the original problem. Spelling, punctuation and grammar are consistently accurate.
4	Presented a good quality evaluation describing the effectiveness of the solution with reasonable reference to the original problem. Spelling, punctuation and grammar are generally accurate.
3	Presented an average quality evaluation making reference to the original problem. Spelling, punctuation and grammar are reasonably accurate.
2	Presented a limited evaluation making some reference to the original problem. Spelling, punctuation and grammar are mostly accurate.
1	Listed methods used. Spelling, punctuation and grammar are basic.
0	No evaluation presented.

User Guide (10 marks)

Marks	
9-10	Produced a complete, clear, easy to use guide, separated into sections. Presentation is of a high quality and uses a wide range of specialist terms. Spelling, punctuation and grammar are consistently accurate.
7-8	Produced a complete guide that may not be entirely clear. Presentation is of a good quality and uses a range of specialist terms. Spelling, punctuation and grammar are generally accurate.
5-6	Produced most of the guide but it is not clearly presented. Presentation is of average quality. Some specialist terms have been used. Spelling, punctuation and grammar are reasonably accurate.
3-4	Produced some of the essential elements of the guide. Presentation is fair. A limited attempt at specialist terms has been made. Spelling, punctuation and grammar are mostly accurate.
1-2	Produced a sketchy and unclear guide. Presentation is poor. Little, if any, attempt has been made to use specialist terms. Spelling, punctuation and grammar are basic.
0	No User Guide presented.

Final mark (1-100)

The final decision on a mark out of 100 should be based on the balance of knowledge and understanding demonstrated and applied, as well as the skills used. After adding the marks for the individual criteria, the total should be checked against the general criteria below to ensure that the final total is in an appropriate band. If it is not, then the individual criteria must be checked again to see where an adjustment needs to be made.

Marks

81-100 The candidate has

- produced a detailed description of the problem, clearly describing appropriate sub-problems and the links between them
- identified and evaluated more than one possible way of tackling the problem
- clearly and appropriately recognised which ways will lead to aspects reusable over time
- clearly and in detail identified the desired outcomes and the performance criteria to be used in evaluating the solution
- correctly identified the information requirements and has chosen with clear justification appropriate systems, tools and/or techniques to solve the problem
- developed a good, planned and creative design for the solution and has clearly described, using appropriate terminology, the relationship between all the various parts of the solution
- described clearly and fully which parts can be re-used and how
- used appropriate resources and techniques with a good level of skill, understanding and efficiency
- produced the necessary evidence in an appropriate form that can easily be verified and interpreted as a solution to the problem
- carried out fully or nearly fully any modifications needed (if any) as a result of testing
- followed their testing plans in a comprehensive manner producing a record of results
- evaluated the results against expectations and determined any modifications to be made
- presented an evaluation clearly discussing the effectiveness of the solution with complete reference to the original problem
- produced a complete, clear, easy to use guide, separated into sections

61-80 The candidate has

- produced a reasonable description of the problem, stating sub-problems and the links between them
- identified and described more than one way of tackling the problem
- sensibly recognised some way which will lead to aspects reusable over time
- stated in reasonable detail the desired outcomes that are usable as performance criteria in evaluating the solution
- correctly identified the information requirements and has chosen with some justification appropriate systems, tools and/or techniques to solve the problem
- developed a planned design for the solution and has described using appropriate terminology the relationship between the essential parts of the solution
- described reasonably which parts can be re-used and how
- produced a reasonable testing plan of their design
- used appropriate resources and techniques with skill, partial understanding and reasonable efficiency
- produced most of the necessary evidence in an appropriate form that can be verified and interpreted as a solution to the problem
- carried out modifications needed (if any) as a result of testing
- followed their testing plan, testing most cases, producing a record of results
- compared their results with expectations and described most modifications needed (if any)
- presented an evaluation describing the effectiveness of the solution with reasonable reference to the original problem
- produced a complete guide that may not be entirely clear

41-60 The candidate has

- produced a description of various aspects of the problem
- identified and briefly described one way of tackling the problem including reusability
- stated some desired outcomes not entirely usable as performance in evaluating the solution
- identified some information requirements and has listed some reasons for a choice of systems, tools and/or techniques used
- developed a design for the solution and has described using some appropriate terminology the relationship between some parts of the solution including reusability
- produced some testing plans of their design
- used the resources and techniques with some skill, and understanding
- produced some of the necessary evidence in an appropriate form that can be verified and interpreted as a solution to the problem
- carried out some modifications needed (if any) as a result of testing
- tested their designs with some reference to their plans
- limited testing to some specific cases, producing a record of results
- made some comparison of results against expectations carried out and described some modifications
- presented an evaluation making reference to the original problem
- produced most of the guide but it is not clearly presented

21-40 The candidate has

- listed some aspects of the problem
- identified a way of tackling the problem
- stated some desired outcomes
- stated an information requirement and has listed a choice of systems, tools and/or techniques
- outlined a design of the solution and has described various parts of the solution with some attempt at linking them
- described some testing to be carried out, with partial planning
- used the resources and techniques with limited skill, and understanding
- produced some evidence in a form that can be verified and interpreted as a solution to the problem
- carried out some testing
- produced a limited list of modifications needed (if any)

- presented a limited evaluation making some reference to the original problem
- produced some of the essential elements of the guide

1-20 The candidate has

- listed an aspect of the problem Stated a limited solution to the problem
- stated at least one desired outcome which may not be entirely appropriate
- listed systems tools and/or techniques
- produced a limited design of the solution showing some stages
- stated a test they will carry out
- used the resources and techniques with limited skill
- produced some evidence of implementation
- attempted to test their design
- produced a limited list of changes (if any)
- listed methods used
- produced a sketchy and unclear guide

Quality of written communication

Quality of written communication is assessed within the marking criteria for the project.

14.5 Evidence to Support the Award of Marks

Teachers should keep records of their assessments during the course, in a form which facilities the complete and accurate submission of the final assessments at the end of the course.

When the assessments are complete, the marks awarded under each of the assessment criteria must be entered on the Candidate Record Form, with supporting information given in the spaces provided. A specimen Candidate Record Form appears in Appendix B; the exact design may be modified before the operational version is issued and the correct year's Candidate Record Forms should always be used.

14.6 Annotation and Supporting evidence

Centres are required to annotate coursework "to show clearly how the marks have been awarded in relation to the marking criteria defined in the syllabus" (GCSE, GCE and AEA Code of Practice April 2009). This enables the moderator to check the centre's assessments against the Assessment Criteria.

Annotation should, therefore:

- describe in all necessary detail practical work which is not available, together with comments from the teacher;
- explain where candidates have received help beyond the normal learning support which has influenced the assessments;
- highlight those key areas which have led to the recognition of a particular mark. Reference to the Assessment Criteria is particularly helpful;
- include any other notes which will help the moderator to appreciate the reasons for the assessment given.

15 Supervision and Authentication

15.1 Supervision of Candidates' Work

Candidates' work for assessment must be undertaken under conditions which allow the teacher to supervise the work and enable the work to be authenticated. If it is necessary for some assessed work to be done outside the centre, sufficient work must take place under direct supervision to allow the teacher to authenticate each candidate's whole work with confidence.

15.2 Guidance by the Teacher

The work assessed must be solely that of the candidate concerned. Any assistance given to an individual candidate which is beyond that given to the group as a whole must be recorded on the Candidate Record Form.

15.3 Unfair Practice

At the start of the course, the supervising teacher is responsible for informing candidates of the AQA Regulations concerning malpractice. Candidates must not take part in any unfair practice in the preparation of coursework to be submitted for assessment, and must understand that to present material copied directly from books or other sources without acknowledgement will be regarded as deliberate deception. Centres must report suspected malpractice to AQA. The penalties for malpractice are set out in the AQA Regulations.

15.4 Authentication of Candidates' Work

Both the candidate and the teacher are required to sign declarations confirming that the work submitted for assessment is the candidate's own. The teacher declares that the work was conducted under the specified conditions, and records details of any additional assistance.

16 Standardisation

16.1 Standardising Meetings

Annual standardising meetings will usually be held in the autumn term. Centres entering candidates for the first time must send a representative to the meetings. Attendance is also mandatory in the following cases:

- where there has been a serious misinterpretation of the specification requirements;
- where the nature of coursework tasks set by a centre has been inappropriate;
- where a significant adjustment has been made to a centre's marks in the previous year's examination.

After the first year, attendance is at the discretion of centres. At these meetings support will be provided for centres in the development of appropriate coursework tasks and assessment procedures.

16.2 Internal Standardisation of Marking

The centre is required to standardise the assessments across different teachers and teaching groups to ensure that all candidates at the centre have been judged against the same standards. If two or more teachers are involved in marking a component, one teacher must be designated as responsible for internal standardisation. Common pieces of work must be marked on a trial basis and differences between assessments discussed at a training session in which all teachers involved must participate. The teacher responsible for standardising the marking must ensure that the training includes the use of reference and archive materials such as work from a previous year or examples provided by AQA. The centre is required to send to the moderator the Centre Declaration Sheet, duly signed, to confirm that the marking of centre-assessed work at the centre has been standardised. If only one teacher has undertaken the marking, that person must sign this form.

A specimen Centre Declaration Sheet appears in Appendix B. (See Page 57)

17 Administrative Procedures

17.1 Recording Assessments

The candidates' work must be marked according to the assessment criteria set out in section 14.3 and 14.4. The marks and supporting information must be recorded in accordance with the instructions in section 14.5 and 14.6. The completed Candidate Record Form for each candidate must be attached to the work and made available to AQA on request.

17.2 Submitting Marks and Sample Work for Moderation

The total component mark for each candidate must be submitted to AQA on the mark sheets provided or by Electronic Data Interchange (EDI) by the specified date. Centres will be informed which candidates' work is required in the samples to be submitted to the moderator.

17.3 Factors Affecting Individual Candidates

Teachers should be able to accommodate the occasional absence of candidates by ensuring that the opportunity is given for them to make up missed assessments.

Special consideration should be requested for candidates whose work has been affected by illness or other exceptional circumstances. Information about the procedure is issued separately.

If work is lost, AQA should be notified immediately of the date of the loss, how it occurred, and who was responsible for the loss. AQA will advise on the procedures to be followed in such cases.

Where special help which goes beyond normal learning support is given, AQA must be informed so that such help can be taken into account when assessment and moderation take place.

Candidates who move from one centre to another during the course sometimes present a problem for a scheme of internal assessment. Possible courses of action depend on the stage at which the move takes place. If the move occurs early in the course the new centre should take responsibility for assessment. If it occurs late in the course it may be possible to accept the assessments made at the previous centre. Centres should contact AQA at the earliest possible stage for advice about appropriate arrangements in individual cases.

17.4 Retaining Evidence and Re–Using Marks

The centre must retain the work of all candidates, with Candidate Record Form attached, under secure conditions, from the time it is assessed, to allow for the possibility of an enquiry upon results. The work may be returned to candidates after the issue of results provided that no enquiry upon result is to be made which will include re-moderation of the coursework component. If an enquiry upon results is to be made, the work must remain under secure conditions until requested by AQA.

Candidates repeating the examination may carry forward their moderated mark for the project component once only and within a twelve month period. It is not possible to carry forward the mark for the assignment.

18 Moderation

18.1 Moderation Procedures

Moderation of the coursework is by inspection of a sample of candidates' work, sent by post from the centre to a moderator appointed by AQA. The centre marks must be submitted to AQA and the sample of work must reach the moderator by the specified date in the year in which the qualification is awarded.

Following the re-marking of the sample work, the moderator's marks are compared with the centre marks to determine whether any adjustment is needed in order to bring the centre's assessments into line with standards generally. In some cases it may be necessary for the moderator to call for the work of other candidates. In order to meet this possible request, centres must have available the coursework and Candidate Record Form of every candidate entered for the examination and be prepared to submit it on demand. Mark adjustments will normally preserve the centre's order of merit, but where major discrepancies are found, AQA reserves the right to alter the order or merit.

18.2 Post-Moderation Procedures

On publication of the GCSE results, the centre is supplied with details of the final marks for the coursework component.

The candidates' work is returned to the centre after the examination with a report form from the moderator giving feedback to the centre on the appropriateness of the tasks set, the accuracy of the assessments made, and the reasons for any adjustments to the marks.

Some candidates' work may be retained by AQA for archive purposes.

Awarding and Reporting

19 Grading, Shelf-Life and Re-Sits

19.1	Qualification Titles	The qualification based on this specification has the following title: AQA GSCE in Information and Communication Technology.
19.2	Grading System	Candidates must be entered for either the Foundation Tier or Higher Tier. For candidates entered for the Foundation Tier, grades C–G are available. For candidates entered for the Higher Tier A*-D are available. There is a safety net for candidates entered for the Higher Tier, where an allowed Grade E will be awarded where candidates just fail to achieve Grade D. Candidates who fail to achieve a Grade E on the Higher Tier or Grade G on the Foundation Tier will be reported as unclassified.
19.3	Re-Sits	Individual components may not be retaken, but candidates may retake the whole qualification more than once.
19.4	Minimum Requirements	Candidates will be graded on the basis of work submitted for assessment.
19.5	Carrying Forward of Centre-Assessed Marks	Candidates re-taking the examination may carry forward their moderated Project marks. These marks have a shelf-life which is limited only by the shelf-life of the specification, and they may be carried forward an unlimited number of times within this shelf-life. It is not possible to carry forward marks for the Assignment.
19.6	Awarding and Reporting	This specification complies with the grading, awarding and certification requirements of the GCSE, GCSE in vocational subjects, GCE and AEA Code of Practice April 2009 and will be revised in the light of any subsequent changes for future years.

Appendices

A Grade Descriptions

The following grade descriptors indicate the level of attainment characteristic of the given grade at GCSE. They give a general indication of the required learning outcomes at each specific grade. The descriptors should be interpreted in relation to the content outlined in the specification; they are not designed to define that content.

The grade awarded will depend in practice upon the extent to which the candidate has met the assessment objectives (as in section 6) overall. Shortcomings in some aspects of the examination may be balanced by better performances in others.

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
- use ICT terms and definitions appropriately and are able to contrast and compare related ideas
- apply general principles of information processing to given situations and abstract general principles from given examples
- identify a range of needs and opportunities, carry out systematic analysis, and design and evaluate effective ways of using information and communication systems
- 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
- use complex lines of enquiry to find and select information, using a wide range of sources
- 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
- 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

- use and develop computer models to investigate and test hypotheses
- use ICT to share, exchange and present work, demonstrating a clear sense of audience and purpose
- discuss methods of detecting the loss or corruption of information and describe steps which can minimise the likelihood of the abuse of personal information
- reflect critically on their use of ICT and show understanding of the effects 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
- show a good understanding of basic ICT terms and definitions and are able to contrast and compare related ideas
- identify needs and opportunities and analyse, design and evaluate appropriate ways of addressing these using information and communication systems
- use complex lines of enquiry to find and select information, from a wide range of sources
- explore, develop and interpret information to carry out a range of tasks and produce appropriate solutions to problems
- 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
- use computer models to investigate and test hypotheses
- use ICT to share, exchange and present work, demonstrating a consideration of audience and purpose
- show awareness of the need to detect the loss or corruption of information and to prevent the abuse of personal information.
- reflect critically on their use of ICT and consider the effects of its use in the wider world

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
- show knowledge of some basic ICT terms and definitions
- respond to needs and opportunities and evaluate ways of addressing these using information and communication systems
- understand the need for precision in framing questions when finding, selecting and collecting information
- use ICT to explore, develop and interpret information
- develop, test and modify sets of instructions to automate processes and to make things happen
- use computer models to detect patterns and relationships
- use ICT to share, exchange and present work and demonstrate how it contributes to the development of their ideas
- reflect on their use of ICT and show some knowledge of its use in the wider world

B Record Forms

Candidate Record Forms are available on the AQA website in the Administration area. They can be assessed via the following link http://www.aqa.org.uk/admin/p_course.php

AQA
ASSESSMENT and QUALIFICATIONS ALLIANCE

Centre-assessed work
Centre Declaration Sheet
2011

Specification Title: ..... **Unit Code:** .....

Centre Name: ..... **Centre No:** | | | | | |

Authentication

This is to certify that marks have been awarded in accordance with the requirements of the specification and that every reasonable step has been taken to ensure that the work presented is that of the candidates named. Any assistance given to candidates beyond that given to the class as a whole and beyond that described in the specification has been recorded on the Candidate Record Form(s) and has been taken into account. The marks given reflect accurately the **unaided** achievement of the candidates.

Signature(s) of teacher(s) responsible for assessment

Teacher 1 ..... **Teacher 2** .....

Teacher 3 ..... **Teacher 4** .....

Teacher 5 ..... **Teacher 6** .....

(Continue overleaf if necessary)

Internal Standardisation of Marking

Each centre must standardise the assessments for this unit across different teachers and teaching groups to ensure that all candidates in the centre have been judged against the same standards. If two or more teachers are involved in marking a unit, one of them must be designated as responsible for standardising the marking of all teachers at the centre who mark the unit.

The following declaration must be signed by the teacher responsible for ensuring standardisation. If all the work has been marked by the same person, that person should sign below.

I confirm that:

(a) *I have marked the work of all candidates for this component;
(b) *the procedure described in the specification has been followed at this centre to ensure that the marking is of the same standard for all candidates.

Signed: ..... **Date:** .....

Signature of Head of Centre ..... **Date:** .....

This form should be completed and sent to the moderator with the sample of centre-assessed work.

C

Overlaps with other Qualifications

Applied Information and Communication Technology GCSE (Double Award)

There is some overlap with GCSE Applied ICT (double award), however the teaching, learning and assessment styles are different.

The units available are as follows. Details of the assessment requirements are given in each unit. Units 1 and 2 are internally assessed by portfolio and Unit 3 is assessed by an externally set and marked assignment.

Unit 1 ICT Tools and Applications

Unit 2 ICT in Organisations

Unit 3 ICT and Society

GNVQ

A list of titles of the AQA compulsory and optional units for the Foundation and Intermediate GNVQ is given below. There are links between the GCSE ICT specification and several of these units. Further details are given in the AQA support material.

Foundation GNVQ

The Units available are as follows. Details of the assessment requirements are given in each unit. The titles in bold and asterisked are Units externally assessed by a written test. For the award of a Foundation GNVQ, a candidate must complete six units:

- four compulsory vocational units in this specification
- two selected optional vocational units.

Compulsory Units

Unit 1 Presenting Information

Unit 2 Handling Information

Unit 3 Hardware and Software *

Unit 4 Graphics *

Optional Units

Unit 5 Design Project

Unit 6 Using Information Resources

Unit 7 Multimedia

Unit 8 Preparing for Employment

Unit 9 Working as Part of a Team

Intermediate GNVQ

The units available are as follows. Details of the assessment requirements are given in each unit.

The titles in bold and asterisked are Units externally assessed by a written test.

For the award of a Intermediate GNVQ, a candidate must complete six units:

- three compulsory vocational units in this specification
- three selected optional vocational units. Candidates must select either unit 6 and/or unit 9 to meet the external assessment requirements.

Compulsory Units

Unit 1 Presenting Information

Unit 2 Handling Information

Unit 3 Hardware and Software*

Optional Units

Unit 4 Design Project

Unit 5 Communicating with Multimedia

Unit 6 Graphics and Desktop Publishing*

Unit 7 Numerical Modelling using Spreadsheets

Unit 8 Databases

Unit 9 Monitoring and Control Systems*

Unit 10 Data Communications and Networks

Unit 11 Programming

Unit 12 Impact of ICT on society