GCSE 2012

ICT

Teachers' Handbook

J461

Version 1

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OCR

Contents

1 Introduction

OCR is offering this new GCSE for first teaching in September 2010. This GCSE replaces the existing GCSE Specification A (1994), Specification B (1995) and Applied GCSE ICT (1494). The details of how this new specification relates to those are summarised in Section 1 of the specification.

We have improved the quality of our GCSEs for teachers and students alike. We've made improvements in two key areas: updated and relevant content and a focus on developing students' personal, learning and thinking skills.

In addition and in response to reforms announced by the Government and in response to Ofqual mandated changes to GCSEs, unitised assessment of this qualification is being replaced by linear assessment from September 2012. This means that candidates commencing a two year course from September 2012 will take all of their GCSE units at the end of the course in June 2014.

The main changes are:

- Controlled assessment and examinations will be summative

- Examinations provide opportunity for extended writing and more varied question types

- All GCSEs will meet the requirements of the Equality Act.

OCR offers a range of support materials, developed following extensive research and consultation with teachers. We've designed them to save you time when preparing for the specification and to support you while teaching them.

It is important to make the point that this Teacher's Handbook plays a secondary role to the specifications themselves. The GCSE ICT specification is the document on which assessment is based: it specifies what content and skills need to be covered. The Teacher's Handbook should be read in conjunction with the Specification and the OCR Guide to Controlled Assessment for GCSE ICT. If clarification on a particular point is sought, then that clarification must be found in the Specification itself.

2   Subject specific guidance

Units B061 and B063 will each be examined with a 1 hour written paper.

Unit B061 will assess candidates' knowledge and understanding of ICT and the impact that it has on them and society. Candidates should study current ICT technology but also be aware of any emerging technologies. Advances in ICT are often swift. Forecasting which technologies will be used in everyday life is impossible, so Centres are advised to ensure that their candidates are kept aware of new developments and uses of ICT.

Unit B063 will assess candidates' knowledge and understanding gained through the use of pre-release materials that relates to specified businesses or organisations and how these use ICT. It will complement the knowledge and understanding gained by candidates from Unit B061.

The sample assessment materials show the types of questions and how they will be marked. When creating an examination paper, Assessors aim to:

- design questions that can be marked accurately and consistently by all Assessors

- cover a wide range of the specification

- provide a balanced coverage of the specification

- have a varied set of questions over a period of time

- ensure readability for the target group of candidates

- meet the needs of the assessment objectives shown in the specification.

Information on internally assessed units B062, B064 and B065 can be found in the 'OCR Guide to Controlled Assessment.

2.1 Unit B061   ICT in today's world

Candidates study a range of ICT systems as used in homes, schools and in society. Candidates need to be aware of current and emerging technologies and the impact that advances through technology may have on themselves and others.

ICT systems are used in the home for control of devices, such as washing machines, microwave ovens, media devices such video players/recorders, central heating, telephone systems, gaming consoles.

Candidates will use the knowledge and understanding gained in this Unit, and in Unit B062, as a basis for Unit B063.

2.1.1 ICT Systems

This section has links to Section 2.3.1 in Unit B063 where candidates will study the specialised systems, hardware and software used in an organisation detailed in the pre-release materials.

Systems

This section requires candidates to know about computer systems (a computer is a machine that follows instructions to manipulate data), the components of the systems, the application and use of computer systems, and the hardware and software in use today.

Computer systems include embedded computers, personal computers, mainframe computers, and super-computers.

the main components of a computer system

Candidates are expected to know about the main parts of a computer system, what these component parts do and why they are used:

- (but candidates do not need to know how this operates)

- internal CPU /main memory: RAM and ROM and their use in different situations e.g. ROM would be used for storing the BIOS because it is needed when the computer first powers up. ROM is also used in some computer systems for storing the operating system and/or applications. RAM is used to hold data being processed by the system and applications being used by the system.

- backing storage devices e.g. hard disks, flash memory, CD-R(W), for example DVD±R(W) and why they are needed in a computer system for example a hard disk or flash memory is used to store data when the computer is switched off because these can retain the data when power is removed

- input and output devices such as those the mentioned in the Hardware section.

- power supplies such as battery, mains electricity supply.

a range of common applications where microprocessor technology is used

Microprocessors are found in all computer systems. Candidates should know about the types of computer systems and how they are used. They should also be aware that the boundaries between types of computer system are not fixed eg some mobile phones can be mini-computers.

Embedded computer systems are designed for one or two limited tasks, for example:

- controlling MP3 players and simple mobile phones

- running digital watches

- controlling traffic lights and pedestrian crossings

- controlling large scale operations eg nuclear power plants.

Personal computers include net books, laptops, notebook computers palmtops, desktop computers, tablet computers, PDAs and handhelds, and are used, for example:

- in the home for general use such as searching the world wide web, using email, typing letters, presentations, used for gaming either alone or on-line, speciality use such as photo or video-editing, spreadsheet and database use

- computers found in businesses and used, in addition to those uses in the home environment, for eg running database management systems, spreadsheets, etc

- computers used for specialised purposes eg computer-aided design, computer aided manufacture, some mission critical applications such as monitoring environmental or power plant parameters.

Mainframe computers are found in large organisations eg banks, insurance companies, utility companies and are used for

- bulk processing of statements, utility bills which is carried out by batch processing

- data processing such as stock control.

Supercomputers are found in organisations eg research departments of eg Universities, Defence Departments which require fast and complex calculations to be carried out

- bulk processing of scientific data

- complex simulations or modelling scenarios

	Candidates should know and understand the appropriate use of the main types of computer system.
the difference between hardware and software	Candidates should be able to explain that hardware comprises the physical components ie those that can be touched, while software is the instructions to make the system carry out a task(s). They should be able to give appropriate examples of each.
different types of software	Candidates should know that software is the instructions that enable users to tell computer systems what to do.

Hardware

This section requires candidates to be able to explain what is meant by hardware and to be able to give appropriate examples of the hardware used in various situations.

input, output, storage and communication devices and their appropriate use	Candidates should know and understand the use of the input devices used to enter data into computer systems.
	Candidates should know and understand the use of the output devices used to give out data/information from computer systems.
	Candidates should know and understand the use of the data storage devices used in computer systems.
	Candidates should know and understand the appropriate use of the media associated with the data storage devices, eg. DVD±R(W) disks are used for transporting large amounts of data, magnetic tape is used for backing up network servers, flash memory, such as that in a USB key drive is a convenient method of transporting data.
	Candidates should know and understand the appropriate use of various communication devices used in ICT systems.
	This will relate to *2.1.7 (v) networking*, and Unit B063 will require candidates to apply their knowledge of these devices to the specific

scenarios detailed in the pre-release materials.

the advantages and disadvantages of a variety of input, output, storage and communication devices	Candidates should be able to discuss the advantages and disadvantages of using the various input, output, storage and communication devices in different situations.
user interfaces	Candidates should be able to describe the different user interfaces used in ICT systems and their advantages and disadvantages. Candidates should be able to describe the features necessary in a good user interface.

Software

different types of commonly used software	Candidates should be able to describe the different types of software used in ICT systems.
appropriate uses of software	Candidates should be able to discuss the appropriate use of the different types of software used in ICT systems.
the advantages and disadvantages of different software applications	Candidates should be able to discuss the advantages and disadvantages of the different types of software used in ICT systems.
the different file types used to support software	Candidates should be able to identify and discuss the appropriate use of various file types used by ICT systems.

2.1.2 Exchanging Information

This section requires candidates to know and understand how to communicate and present information using ICT systems. Candidates should also know and understand the implications of the use of ICT when exchanging information.

Communications

communication services	This would include email, web browsing, file transfer, social networking, instant messaging.
sharing, exchanging and managing information	Candidates should know and understand how to use communication services to share and exchange information. They should know and understand how to manage the information appropriately for example suitable folders for storage, filters, address books, distribution lists.
the safe and responsible use of communication services	Candidates should know and understand how to use communication services appropriately to ensure the safety and security of others, themselves and their data. They should be able to discuss the issues referred to in **2.1.5 Keeping data safe and secure** and how to apply these when exchanging information.
communications software	Candidates should be able to describe the features of:

- web browsers

- email and email clients

- instant messaging software

- file transfer software

the use of the internet	Candidates should be able to describe web browsing and searching the world wide web for information, the use of email for sending messages and attachments, and discuss the associated issues, advantages and disadvantages.
controlling ICT systems remotely	Candidates should know and understand:

- the use of remote control devices in the home to program eg media players, recording systems

- the use of the internet to monitor and control remote devices eg security cameras

- the use of remote programming of eg video recorders via text messaging, web interfaces.

monitoring and tracking systems	Candidates should be able to describe the use of monitoring/tracking.
emerging technologies	New and emerging technologies such as artificial intelligence, robotics, biometrics, vision enhancement, computer-assisted translation of languages, quantum cryptography, 3D and holographic imaging, 3D printing, virtual reality.

2.1.3 Presenting information

types and purposes of different ways of presenting information	Candidates should know and understand the different ways of using ICT to present information as appropriate for different purposes. Candidates should become familiar with the range of application software as listed in **2.1.1 ICT Systems** and how these can be used to present information.
the use of ICT tools and features/facilities for presenting information with regard to efficiency and quality of work, ease of transfer	Candidates should know and understand the features of:

- word processor and desktop publishing software

- slideshow software

- multimedia software

- web authoring software.

to present information as appropriate for different purposes such the creation of:

letters, memos, reports, theses, flyers, brochures, posters, business cards, slideshow presentations, interactive presentations, email, web sites/pages, animations etc.

Examples of features/facilities including:

left/right/full justification, centring, indentation, emboldening, italics, underlining, copy, cut and paste, bullets, numbering, font selection, point size, font highlight and colour, borders, page and line breaks, columns, tabs, tables, spelling and grammar, word count, inserting images and/or other objects, grouping, ungrouping, layering, sound effects, animation.

integration between and within software	Candidates should understand the need for integration between, and within, software applications and they should be able to explain how this

applications	is brought about and to discuss the situations where it is necessary and/or desirable.

2.1.4 Manipulating data

Data management

different data types	Candidates should be able to identify various different data types such as logical/Boolean, alphanumeric/text, numeric (real and integer) and date and to be able, with reasons, to select the appropriate data types for a given set of data.
the main issues governing the design of file structures	Candidates should know and understand that file structure design is important and be aware that:

- related data/information should be grouped together

- there should be as few accesses to eg. disks as possible to retrieve data

- provision must be made for the addition/deletion of data within files

- the use of different direct/sequential access methods affect file structure

- the use of tree structures and/or indices has an affect on speed of access.

the main issues governing the design of data capture forms, screens and reports	Candidates should know and understand how the design of the forms should reflect, amongst others, eg the need for:

- accuracy of data capture

- speed of data capture

- optimisation for onward transfer of data

- consistent layouts, colour schemes etc

- clear and consistent navigation pathways

- uncluttered screens that follow the natural path of reading.

validation and verification	Candidates should know and understand the need for validation and verification. They should be able to describe the appropriate use of validation and verification in practical contexts, such as methods of verification (eg visual checks, double entry) and validation checks (eg presence, format/picture, length, range, check digit) when data is entered.

Data handling software

the features of data handling software	Candidates should be able to:

- describe the features of spreadsheet database and modelling.

typical tasks for which data handling software can be used	Candidates should be able to:

- describe typical tasks for which database, spreadsheet and other modelling software can be used.

data modelling	Candidates should be able to describe how a data model may be used for answering 'what-if' questions and explain the benefits of using a data

	model to answer such questions.
the use of relational databases and spreadsheets	Candidates should be able to: • describe how data handling software can be used to test hypotheses by the modification of rules • describe how data handling software can be used to manipulate and present data.
emerging data handling applications	Examples would include advances in data mining to find patterns in eg. weather modelling.

2.1.5 Keeping data safe and secure

backups and archiving	Candidates should know and understand the terms backup and archive, the difference between the two, methods of backup and archiving data, and the need for backups and for archives.

secure and safe practices in the use of ICT
 	
appropriate User Security methods and devices
 	
malicious software and the damage it can cause
 	
the procedures users can take to minimise risks of damage caused by malicious software
 	
how to avoid the loss/disclosure of personal data to unauthorised users
	These sections are linked to **2.1.2 iii, the safe and responsible use of communication services** and also include:
	
	• the need for security of data and personal information when using ICT
	
	• the dangers posed by viruses
	
	• the dangers posed by eg. key logging software
	
	• what is meant by hacking
	
	• a range of methods for preventing unauthorised access to computer systems and of keeping data/information secure eg. the use of:
	
	  - user IDs
	  - passwords
	  - encryption
	  - anti-virus software
	  - firewalls
	  - spy ware detection.

what is meant by data encryption and when and why it is used	Candidates should know what is meant by data encryption and when and why it is used. They should also know about encryption keys.

2.1.6 Legal, social, ethical and environmental issues when using ICT

the main aspects of legislation relating to the use of ICT	Candidates should have a knowledge of the main principles of the relevant legislation relating to the use of ICT/computer systems and how these apply to their, and others, use of ICT. Candidates should also be aware of other legislation as it applies to the use of ICT eg. the publication of materials should not infringe legislation such as the Official Secrets Acts, not be obscene, not be discriminatory, not be defamatory or incite people to commit crimes.
the potential health problems related to the prolonged use of ICT systems	Candidates should know and understand: • the potential dangers to health, and their prevention, of prolonged use of ICT.

the need for good design of user interfaces and their impact on the health of users	Candidates should know and understand: • the need for good design of user interfaces so that the interface is: - easy/efficient to use - easy/easier to learn - satisfying to the user in use • the impact on the health of the user of poor interface design eg. - repetitive actions - poor text representations - inappropriate use of colour/layout etc.
how ICT systems can affect the quality of life experienced by persons with disabilities	Candidates should know and understand: • a range of input devices such as - puff-suck switch - foot mouse - Braille keyboard - microphone • a range of output devices such as - speakers/headphone • software facilities eg. - zoom - predictive text - voice recognition/synthesis as used by persons with disabilities to enhance their experience of life.
a range of safety issues related to using computers and measures needed for prevention of accidents	Candidates should know and understand: • the need for physical safety when using ICT and how to ensure that dangers are minimised eg. - electrical safety - physical safety of computer equipment, wiring and furniture and how to prevent accidents.

2.1.7 Using ICT systems

How ICT systems are used

the correct procedures to start, access, exit and shutdown ICT systems	Candidates should be able to describe how to properly use ICT systems such as laptops, home computers and school networked computers.
the selection and appropriate adjustment of system settings and user preferences	Candidates should be able to describe how to properly and appropriately adjust user settings and preferences to enhance their use of ICT.
the selection and use the features of user interfaces	Candidates should be able to describe how and why to select appropriate features and to be able to describe their appropriate use.
the management of folder structures and files to ensure the safe storage and retrieval	Candidates should be able to describe the appropriate management of folders and files to ensure that data is kept safe and can be retrieved as required. This would relate to **2.1.5 Keeping data safe and secure.**

of information	
networking	This would relate to **2.1.1 ICT Systems, Hardware** *(I) input, output, storage and communication devices and their appropriate us.*
	Candidates should be able to describe the main types of networks, the main components of networks and their function(s).
	Candidates should also be able to discuss the advantages and disadvantages of using networks.

Troubleshooting

common problems encountered when using ICT systems	Candidates are expected to be aware of the more common problems when using ICT eg. printer problems, and how trouble-shoot them with a view to solving the problem.
troubleshooting activities	Candidates should be able to distinguish between those problems caused by software e.g. file not found, page not found, cannot load this file etc and those caused by hardware eg. printing problems.
the difference between hardware and software problems, and how these can be solved	

2.1.8 Monitoring, measurement and control technology

the different types of sensor and their suitable uses	Candidates should be able to identify the most appropriate sensor to use to gather data on eg. weather and environmental conditions, control of machinery, data logging eg. counting vehicles, people.
the advantages and disadvantages of computerised data logging	Candidates should be able to identify and discuss the advantages and disadvantages of computerised data logging rather than logging data manually.
writing a sequence of instructions to control a screen image or external device	Candidates should be able to create instructions to respond to data from sensors and to understand and write a sequence of instructions to control a screen image or external device such as motors, heaters, lights, buzzers, or turtle, using repeated instructions, procedures and variables as appropriate.
the use of ICT to control and monitor areas of everyday living	Candidates should be able to identify typical applications that involve the use of control and data logging software; to understand the need for analogue to digital conversion and why it is necessary; describe the main components of the control-feedback loop of a closed system i.e. input, process, output, feedback, and be able to describe typical applications using physical variables such as in the control of environments eg. office, greenhouse, households, security applications such as alarm systems, and eg. electronic tagging of persons and goods.

2.1.9 ICT and modern living

how ICT systems have changed the way people go about their daily lives, including communication and	Candidates should be able to discuss how ICT, and advances in ICT, enables/has enabled eg: • changes in employment/working practices eg. working from home, remote call centres

shopping

- online banking

- online buying and selling of goods and services

- monitoring of persons/premises/environmental conditions/transport for the purposes of surveillance/security.

They should be able to discuss the implications, benefits and drawbacks of using ICT for such purposes.

how ICT systems are used to facilitate modern living

Candidates should also be able to describe how using ICT facilitates modern living with regard to e.g. transport systems, home environments, entertainment, communications between individuals and to discuss the appropriate benefits and drawbacks.

2.3 Unit B063   ICT in context

Candidates study a range of ICT systems in a business or organisational context. Candidates should be aware of current and emerging technologies and their impact on themselves and others. This unit will incorporate and build on the knowledge and understanding gained in units B061 and B062.

The question paper will be based upon pre-release material, relating to specified business or organisation(s) and its/their use of ICT. Typical organisations could include:

- health centres

- leisure centres

- schools

- retail organisations eg. supermarket chains, on-line retailers

- manufacturing businesses

- construction companies.

This is not an exhaustive list.

The pre-release material will be available to centres prior to the examination. Candidates are **not** permitted to take any preparatory work into the examination room.

2.3.1 ICT systems

Systems

specialist equipment used by the organisation detailed in the pre-release material	The pre-release material will detail an organisation and candidates should be able to show their knowledge and understanding of the specialist hardware used in the organisation. Examples include: • the use of robotics in manufacturing • the use of monitoring and control equipment used in eg. leisure centres, medical centres.

a range of commercial applications where microprocessor technology is used	Commercial applications of microprocessors include:
	
	• embedded systems
	
	• personal computer systems
	
	• entertainment such as
	
	  - digital television, interactive television systems, on demand television systems
	  - computer gaming
	
	• monitoring and control of manufacturing plants
	
	• monitoring and control of power plants
	
	• monitoring and control of water treatment systems.

operating systems and applications software	Candidates should show knowledge of the various operating systems used in large organisations, as well as those designed for home/small

	business use.
mobile, portable, and desktop ICT tools for a variety of tasks	Candidates should know and understand the typical software tools available on eg. portable devices such as:
	• PDAs
	• mobile telephones
	• mobile media players.
the fundamental differences between the technologies used and their appropriate commercial use	Candidates should know and understand the differences between the ICT used in home environments and that used in commercial organisations.
Hardware *specialist input, output, storage and communication devices such as those used by the organisation detailed in the pre-release material*	The pre-release material will detail the scenario and the organisations to be studied.
	The specialist hardware used by the given organisation should be studied.
the advantages and disadvantages of a variety of input, output, storage and communication devices within a given context	Candidates will be expected to show knowledge of the use of the hardware in the defined context, and of the advantages and disadvantages of using the specialist hardware.
Software *different types of specialist software and their uses*	The pre-release material will detail the scenario and the organisations to be studied.
software applications used by organisations	The specialist software used by the given organisation should be studied.
the advantages and disadvantages of different software applications and their use in a defined context	Example specialist software includes:
	• accounting packages
	• Computer Aided Design software
	• Computer Aided Manufacture software
	• Expert Systems as used in eg. medical diagnosis, mineral prospecting, car engine fault diagnosis.
	Candidates will be expected to show knowledge of the use of these software applications in the defined context, and of the advantages and disadvantages of using the specialist software.

2.3.2 Networks

the main components of computer networks

Candidates should also know and understand the appropriate use of various communication devices used in 2.3.1 ICT systems, such as:

- routers – both fixed-wiring and wireless
- access points
- hub/repeaters
- network interface cards.

This will relate to **2.1.1. Hardware** and **2.1.7 (v) networking**. Candidates are expected to be able to apply their knowledge to the specific scenarios detailed in the pre-release materials.

network topologies

Candidates should have knowledge and understand the advantages and disadvantages of different network topologies such as:

- wireless
- bus
- star
- ring
- hybrid.

the advantages and disadvantages of using computer networks

Candidates should be able to discuss the advantages and disadvantages of using computer networks and to be able to apply their knowledge to the scenario in the pre-release materials.

the use of internal and external networks

Candidates should know and understand the uses of eg.

- intranets
- extranets.

2.3.3 Information Knowledge Based Systems (IKBS) and Expert Systems

the purpose of IKBS and Expert Systems and how they are used for diagnostic work and decision making

Candidates should know and understand

- the uses of IKBS and Expert systems
- how IKBS and Expert systems are created
- how IKBS and Expert systems are used for diagnostic work and decision making.

2.3.4 Project planning

the way ICT facilitates collaboration and teamwork

Candidates should be able to describe how ICT can be used to eg.

- communicate and share ideas
- communicate progress.

the main stages of the project

Candidates should be able to describe the main stages:

management/systems lifecycle, including methods and processes used	• Analysis • Design • Development, Testing and Implementation, Maintenance • Documentation • Evaluation.
how ICT can be used to plan and manage projects	Candidates should be able to describe how ICT can be used to eg. • identify the main tasks and sub-tasks and sort them into an appropriate order • allocate the appropriate time to each task and allows for contingencies • monitor progress throughout the project • communicate progress at various stages.
a range of systems investigation methods	Candidates should be able to explain and discuss the advantages and disadvantages of various methods of investigation: • observation • interviews • questionnaires and/or data capture forms • document/data analysis
systems implementation strategies	Candidates should be able to explain and discuss the advantages and disadvantages of various methods of implementing new ICT systems: • phase • pilot • direct changeover • parallel.

2.3.5 Exchanging information

Communications

communication services used in organisations *how organisations share, exchange and manage information* *sharing, exchanging and managing information with employees and with the wider customer base* *how organisations use*	Candidates should be able to describe and discuss the advantages and disadvantages of various methods of communication used in commercial organisations and how these organisations make use of ICT in sharing and managing information with employees and customers. Candidates should use their knowledge gained in B061 to investigate and study the scenario(s) given in the pre-release material

the internet

specialist hardware used in the organisation detailed in the pre-release material

how developments in technology lead to new forms of communication

Communications software

the appropriate use of software to communicate information to different audiences

how organisations use data handling software

how organisations use a data model

the use and purpose of communication software for commercial purposes

Candidates should be able to describe and discuss the advantages and disadvantages of various methods used to present and communicate information to different audiences.

Candidates should use their knowledge gained in B061 to investigate and study the scenario(s) given in the pre-release material.

2.3.6 Presenting information

the different types and purposes of software for business use

the integration of applications to achieve outcomes

the use of the features of software used by organisations to present information

Candidates should use their knowledge gained in B061 to investigate and study the use of software applications as applicable to the scenario(s) given in the pre-release material.

2.3.7 Manipulating data

Data management

the purpose and methods of data management used by commercial organisations

data management tools

the use of relational databases, spreadsheets and

Candidates should use their knowledge gained in B061 to investigate and study how data is managed by commercial organisations and, in particular, the organisation(s) detailed in the pre-release materials.

other software used by businesses and organisations.

Data handling software

commonly used features of data handling software and their purpose

how a data model may be used for project planning and costing

Candidates should use their knowledge gained in B061 to investigate and study how data handling software is used in organisation(s) and organisations use data models for eg.

- planning projects

- financial planning/projections.

2.3.8 Legal, social, ethical and environmental issues when using ICT within context

the main aspects of legislation relating to the use of ICT within the organisation detailed in the pre-release material

Candidates should use and apply their knowledge gained in BO61 of the current legislation relating to the use of ICT eg.

- Computer Misuse Act(s)

- Copyright, Design and Patents Act(s)

- Data Protection Act(s)

- Health & Safety at Work Act(s).

the changes in working practices due to the use of ICT within the organisation detailed in the pre-release material

Candidates should have knowledge of and understand the advantages and disadvantages of changes in working practices brought about by the increased use of, and advances in, ICT.

the use of ICT for security, monitoring, surveillance and data security

Candidates should have knowledge of, understand and be able to discuss the implications, advantages and disadvantages of, the use of ICT in ensuring that persons and data are safe and secure.

environmental issues connected to the production, use and disposal of ICT systems, the effect on natural resources of the creation and use of ICT systems

Candidates should have knowledge of and understand, and be able to discuss the implications to the environment and natural resources of increased use of ICT systems and the issues raised by the disposal of unwanted ICT hardware.

2.3.9 Managing data/keeping data safe and secure when using ICT within a given context

appropriate methods that could be used to make backups and archives

appropriate secure and safe practices that could be used

appropriate user

Candidates should use and apply their knowledge gained in B061 and be able to apply it to the scenario(s) given in the pre-release materials.

security methods and devices that could be used

the procedures that could be used to minimise the risks of security breaches

2.3.10 Current and emerging technologies

changes in everyday ICT use

evolving communication systems and how they affect the way people live

how emerging technologies affect the way companies and their staff operate and work together

Candidates should have knowledge of and be able to discuss the rapid changes in ICT systems, the use of evolving and emerging ICT systems and the way these affect their and others' lifestyle and working environments.

Candidates should use and apply their knowledge gained in B061 and be able to apply it to the scenario given in the pre-release materials.

3   Transition guides

Moving from existing OCR GCSE Specifications

Transition from GCSE ICT A Short Course Specification (1094) to the New GCSE ICT Short Course (J061)

1094 GCSE ICT Short Course Units		J061 New GCSE ICT Short Course
2357 Paper 1 (Exam 40%)	Changing to	B061 ICT in today's world (Exam 40%)
2358 Project 1A/1B (Coursework 30%+30%)		B062 Practical applications in ICT (Controlled assessment 60%)

2357 Paper 1 transition to **B061 ICT in today's world**

Main changes to structure:

- There are no tiers (Foundation/Higher).
- Duration of the exam is 1 hour.
- Combination of short answer and long answer questions.
- No contextualised questions.

Common content with reference to additional sections:

- Systems, Hardware and Software.
    - Hardware: communications devices to extend to routers and hubs.
    - Software: communications software to extend to social networking, chat, instant messaging, file transfer and email clients.

- Exchanging information.
  - Monitoring and tracking systems like automatic number plate recognition, electronic consumer worker call monitoring/recording, electronic consumer surveillance and mobile phone triangulation.
  - Emerging technologies with specific reference to mobile technologies.
- Presenting information.
- Manipulating data: data management and data manipulation.
  - Validation and verification types extended.
  - The use of relational databases and spreadsheets.
- Keeping data safe and secure.
  - How to avoid the loss/disclosure of personal data to unauthorized users.
  - Protecting data from accidental/deliberate destruction.
- Legal, social, ethical and environmental issues when using ICT.
  - The environmental impact of digital devices: their use, deployment and eventual recycling and disposal.
  - The social and ethical implications of the electronic transmission of personal information: monitoring/detecting loss or corruption of information, preventing the abuse of personal information, the purpose and costing of national databases, security of public data, links between public and private databases, national identity cards, CCTV, government access to personal data, the surveillance society.
- Using ICT systems: How ICT systems are used and Troubleshooting.
  - The selection and use of the features of user interfaces.
  - The selection and appropriate adjustment of system settings and user preferences.
- Monitoring, measurement and control technology.
- ICT and modern living.
  - How ICT systems have changed the way people go about their daily lives: communication, shopping, gaming, entertainment, education and training, banking and financial services, social networking, online/remote working, the advantages/benefits and disadvantages/dangers of using ICT/internet.
  - The impact of emerging technologies on organisations: artificial intelligence, robotics, biometrics, vision enhancement, computer-assisted translation, quantum cryptography, 3D and holographic imaging, 3D printing, virtual reality.

2358 Project 1A/1B transition to **B062 Practical applications in ICT**

Important Note: Many aspects of this unit will have closer links to the coursework unit 2360 Project 2 from the GCSE ICT Full Course. Project 1b Data Handling is the closer link to B062 for those teaching GCSE ICT Short Course only.

Main changes to structure:

- All aspects of Project 1a are covered in B061 from a theoretical viewpoint or in B064 from a practical viewpoint.
- Control, Measurement and Modeling strands to Project 1b are not included in this unit.
- Coursework changes to Controlled Assessment involving the following:
    - All student work must be completed under supervised conditions ranging from Low to Medium.
    - All submitted student work must be kept secure.
    - All submitted student work must not be accessible to students.
- Assessment carried out through 3 level mark bands with 'best fit' approach.
- Scenario based provided by OCR.
- Solution for scenarios to be a data handling solution.
- Option to submit student work postal (paper or digital media) or repository.

Main changes/additions to content including links to 2360 Project 2 coursework unit:

- Investigating a need.
    - Research a given context (new to Project 1b and Project 2).
    - Analyse systematically the information requirements to solve ICT problems (new to Project 1b only).
    - Think creatively, logically and critically throughout the development process of a set ICT-based solution (new to Project 1b and Project 2).
    - Work effectively with others to gain and share knowledge (New to Project 1b and Project 2).
    - Produce a design brief (New to Project 1b).
    - Produce a system specification (New to Project 1b).
    - Produce measurable success factors (New to Project 1b and Project 2).
- Practical use of software tools to produce a working solution.
    - Create sequences of instructions (New to Project 1b).
    - Integrate tools and techniques to work efficiently and to meet user needs (New to Project 1b).
    - Understand and adopt safe, secure and responsible working practices when using ICT (New to Project 1b and Project 2).
- Practical use of file and data structure to produce a working solution.
    - Model situations and data to explore and develop ideas (New to Project 1B and Project 2).
    - Check data plausibility (New to Project 1b and Project 2).

- Present their solution (all aspects new to Project 1b and Project 2):
  - Use a range of ICT tools and media to communicate data and information effectively and in a form that demonstrates a clear sense of purpose and audience.
  - Understand how information should be interpreted and presented to suit purpose and audience.
  - Present information in ways that are fit for purpose and audience.
- Evaluation (All aspects are new to Project 1b):
  - Evaluate their own and others' contribution (Partially new to Project 2).
  - Test their own solution.
  - Create and review their own ICT-based solution.
  - Review and modify work as it progresses to improve the quality of the ICT-based solution (New to Project 2).
  - Evaluate and amend their own solutions to a set problem (New to Project 2).
  - Identify strengths and weaknesses.
  - Identify areas to improve and recommend and justify appropriate changes that could be made (Partially new to Project 2)
  - Present their evaluation in a relevant, clear, organised, structured and coherent format.
  - Use specialist terms correctly and appropriately.

Transition from GCSE ICT A Specification (1994) to the New GCSE ICT Specification (J461)

1994 GCSE ICT Full Course Units		J461 New GCSE ICT Full Course
2357 Paper 1 (Exam 20%)		B061 ICT in today's world (Exam 20%)
2358 Project 1A/1B (Coursework 30%)	Changing to	B062 Practical applications in ICT (Controlled assessment 30%)
2359 Paper 3 (Exam 20%)		B063 ICT in context (Exam 20%)
2360 Project 2 (Coursework 30%)		B064 Creative use of ICT (Controlled assessment 30%) OR B065 Coding a solution (Controlled assessment 30%)

2359 Paper 3 transition to **B063 ICT in context**

Main changes to structure:

- There are no tiers (Foundation/Higher).
- Duration of the exam is 1 hour.
- Combination of short answer and long answer questions.
- Contextualized questions based on pre-released material published in September of every year and available for January and June series.
- Incorporated knowledge from units B061 and B062.
- Preparatory work not permitted in the examination room.

Main changes/additions to content:

- Systems, hardware and software.
  - Content derived from new technology available.
- Networks.
- Information Knowledge Based Systems (IKBS) and Expert Systems.
- Project planning.
  - Main stages of the project management cycle.
  - How ICT can be used to plan and manage projects.
  - Range of systems investigation methods.
  - Systems implementation strategies.
- Exchanging information: Communications and communications software.

- o Communication services used in organizations.
- o How organizations share, exchange and manage information.
- o Sharing, exchanging and managing information with employees and with the wider customer base.
- o Specialist hardware used in the organization detailed in the pre-release material.
- o Developments in technology lead to new forms of communication.
- Presenting information.
- Manipulating data: data management and data handling software.
  - o Data management: the purpose and methods of data management used by commercial organizations.
  - o Data management tools.
  - o Data handling software: how a data model may be used for project planning and costing.
- Legal, social, ethical and environmental issues when using ICT within context.
  - o Environment issues connected to the production, use and disposal of ICT systems, the effect on natural resources of the creation and use of ICT systems.
- Managing data/keeping data safe and secure when using ICT within a given context.
- Current and emerging technologies.
  - o Changes in everyday ICT use.
  - o Evolving communication systems and how they affect the way people live.
  - o New and emerging technologies.

2360 Project 2 transition to **B064 Creative use of ICT**

Important Note: Many aspects of this unit will have closer links to the coursework unit 2358 Project 1a from both the GCSE ICT Short and Full Course. There are obvious links also to 2360 Project 2 in terms of the development life cycle.

Main changes to structure:

- There are two strands to this unit: Creating a multimedia solution and Creating a computer game.
- Coursework changes to Controlled Assessment involving the following:
  - o All student work must be completed under supervised conditions ranging from Low to Medium.
  - o All submitted student work must be kept secure.
  - o All submitted student work must not be accessible to students.
- Assessment carried out through 3 level mark bands with 'best fit' approach.
- Scenario based provided by the board.
- Solution for scenarios to be a multimedia product or a computer game according to the defined scenario.
- There is no limitation to the possible solutions provided that they are aimed at solving the scenario.
- Option to submit student work postal (paper or digital media) or repository.

Main changes/additions to content including links to 2358 Project 1a coursework unit:

- Analysis.
    - Identify and assess existing solutions to similar problems (Project 2)
    - Produce a plan for the development of a multimedia solution (new content).
    - Specify the required hardware and software (Project 2)
    - Specify the user requirements (Project 2)
    - Define the success criteria for a solution to a problem (new content)
- Design.
    - Explain how the proposed solution will be fit for purpose
    - Design individual components of the solution (Project 2)
    - Design screen layouts (Project 1a and Project 2)
    - Design the overall solution incorporating navigational aids (Project 1a and Project 2)
    - Design testing routines (new content)
- Development.
    - Create new, or modify existing, components of a solution (Project 1a)
    - Create screen layouts (Project 1a)
    - Create navigational aids (Project 1a and Project 2)
    - Create a working solution (new content/Project 1a).
    - Adhere to a prepared plan for their solution (new content).
- Testing.
    - Test the solution they have produced (Project 2)
    - Have potential users test their solution (Project 2)
    - Test solutions that other people have produced (new content)
- Evaluation.
    - Use the results of testing and identify the limitations of their solution (Project 2)
    - Use the results of testing and recommend possible improvements to their solution (Project 2)
    - Evaluate the solution with regard to purpose (Project 2)
    - Evaluate the solution with regard to the success criteria and improve their solution (new content)
- Working with others (complete new content).
    - Plan work with others, identifying objectives and clarifying responsibilities
    - Work with others towards achieving given objectives, carrying out tasks to meet their responsibilities
    - Recommend ways of improving work with others to achieve given objectives.

B065 Coding a solution

Important Note: Although this is a completely new unit, the structure of this unit is similar to that of Project 2.

Main aspects:

- Controlled Assessment involving the following:
    - All student work must be completed under supervised conditions ranging from Low to Medium.
    - All submitted student work must be kept secure.
    - All submitted student work must not be accessible to students.
- Assessment carried out through 3 level mark bands with 'best fit' approach.
- Scenario based provided by the board.
- There is no limitation to the possible solutions provided that they are aimed at solving the scenario.
- Option to submit student work postal (paper or digital media) or repository.

Content:

- Programming techniques.
    - Identify and use the three basic programming constructs used to control the flow of a program: sequence, select, iterate
    - Understand and use suitable select statements
    - Understand and use suitable loops including count and condition controlled loops
    - Use different data types, including Boolean, String, Integer and Real, appropriately in solutions to problems
    - Define and use arrays as appropriate when solving problems.
- Analysis.
    - Identify the information required to solve a problem
    - Produce a plan for the development of the solution
    - Specify the required hardware and software
    - Define the success criteria for later reference during evaluation
    - Participate in group work.
- Design.
    - Describe how the proposed solution will be fit for purpose.
    - Design individual components of the solution.
    - Design input and output formats.
    - Design an overall solution using suitable algorithms.
    - Design testing routines.

- Development.
  - Create a coded solution.
  - Create systems for input to and output from the solution.
  - Create navigational paths and methods.
  - Create a working solution.
  - Adhere to a prepared plan for their solution.
- Testing.
  - Test the solution they have produced.
  - Have potential users test their solution.
  - Test solutions that other people have produced.
- Evaluation.
  - Use the results of testing and identify the limitations of their solution
  - Use the results of testing and recommend possible improvements to their solution
  - Evaluate the solution with regard to purpose
  - Evaluate the solution with regard to the success criteria
  - Improve their solution.

Transition from GCSE ICT Short Course Specification (1095) to the New GCSE ICT Short Course (J061)

1095 GCSE IT Short Course Units		J061 New GCSE IT Short Course
2377 Paper 1 (Exam 40%)	Changing to	B061 ICT in today's world (Exam 40%)
2378 Unit 1 (Coursework 60%)		B062 Practical applications in ICT (Controlled assessment 60%)

- **2377 Paper 1 transition to B061 ICT in today's world**

Main changes to structure:
  - There are no examination tiers (Foundation/Higher).
  - Combination of short answer and long answer questions. As opposed to multiple choice on 2377

- **2378 Unit 1 transition to B062 Practical applications in ICT**

Main changes to structure:
  - Controlled Assessment rather than coursework project
  - Coursework changes to Controlled Assessment involving the following:
    - All student work must be completed under supervised conditions ranging from Low to Medium.
    - All submitted student work must be kept secure.
    - All submitted student work must not be accessible to students.
    - Option to submit student work postal (paper or digital media) or repository.
    - Assessment carried out through 3 level mark bands with 'best fit' approach.
    - Scenario based provided by OCR.
    - Solution for scenarios to be a data handling solution.

GCSE ICT Full Course (1995) to new GCSE ICT Full Course (3461)

1995 GCSE ICT Full Course Units		J461 New GCSE ICT Full Course
2377 Paper 1 (Exam 20%)	Changing to	B061 ICT in today's world (Exam 20%)
2378 Unit 2 (Coursework 30%)		B062 Practical applications in ICT (Controlled assessment 30%)
2380 Paper 2 (Exam 20%)		B063 ICT in context (Exam 20%)
2379 Unit 3 (Coursework 30%)		B064 Creative use of ICT (Controlled assessment 30%) OR B065 Coding a solution (Controlled assessment 30%)

2380 Paper 2 transition to B063 ICT in context
Main changes to structure:
- There are no examination tiers (Foundation/Higher).
- Duration of the exam is 1 hour.
- Incorporated knowledge from units B061 and B062.
- Preparatory work not permitted in the examination room.

2379 Unit 3 transition to B064 Creative use of ICT
Main changes to structure:
- There are two strands to this unit: Creating a multimedia solution and Creating a computer game.
- Assessment carried out through 3 level mark bands with 'best fit' approach.
- Scenario based provided by the board.
- Solution for scenarios to be a multimedia product or a computer game according to the defined scenario.
- There is no limitation to the possible solutions provided that they are aimed at solving the scenario.
- Option to submit student work postal (paper or digital media) or repository.

B065 Coding a solution

Important Note: Although the structure of this unit retains the structure of developing a system/solution

Main aspects:

- Controlled Assessment involving the following:
    - o All student work must be completed under supervised conditions ranging from Low to Medium.
    - o All submitted student work must be kept secure.
    - o All submitted student work must not be accessible to students.
- Assessment carried out through 3 level mark bands with 'best fit' approach.
- Scenario based provided by the board.
- There is no limitation to the possible solutions provided that they are aimed at solving the scenario.
- Option to submit student work postal (paper or digital media) or repository.

Content:

- Programming techniques.
    - o Identify and use the three basic programming constructs used to control the flow of a program: sequence, select, iterate
    - o Understand and use suitable select statements
    - o Understand and use suitable loops including count and condition controlled loops
    - o Use different data types, including Boolean, String, Integer and Real, appropriately in solutions to problems
    - o Define and use arrays as appropriate when solving problems.
- Analysis.
    - o Identify the information required to solve a problem
    - o Produce a plan for the development of the solution
    - o Specify the required hardware and software
    - o Define the success criteria for later reference during evaluation
    - o Participate in group work.
- Design.
    - o Describe how the proposed solution will be fit for purpose.
    - o Design individual components of the solution.
    - o Design input and output formats.
    - o Design an overall solution using suitable algorithms.
    - o Design testing routines.

- Development.
  - o Create a coded solution.
  - o Create systems for input to and output from the solution.
  - o Create navigational paths and methods.
  - o Create a working solution.
  - o Adhere to a prepared plan for their solution.
- Testing.
  - o Test the solution they have produced.
  - o Have potential users test their solution.
  - o Test solutions that other people have produced.
- Evaluation.
  - o Use the results of testing and identify the limitations of their solution
  - o Use the results of testing and recommend possible improvements to their solution
  - o Evaluate the solution with regard to purpose
  - o Evaluate the solution with regard to the success criteria
  - o Improve their solution.

Subject Content	ICT B	Unit B061 ICT in today's world	Unit B062 Practical applications in ICT	Unit B063 ICT in context	Unit B064 Creative use of ICT	OR	Unit B065 Coding a solution
		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
ICT Systems Hardware							
input devices and their appropriate use	☑	☑	☑	☑			
output devices and their appropriate use:	☑	☑	☑	☑			
storage devices and their appropriate use	☑	☑	☑	☑			
communication devices and their appropriate use	☑	☑		☑			
the advantages and disadvantages of input, output, storage and communication devices	☑	☑		☑			
user interfaces		☑		☑			
Specialist hardware as specified in pre-release material	☑			☑			

Subject Content	ICT B	Unit B061 ICT in today's world	Unit B062 Practical applications in ICT	Unit B063 ICT in context	Unit B064 Creative use of ICT	OR	Unit B065 Coding a solution
		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
ICT Systems Software							
systems software: operating systems / utility software / drivers	☑	☑	☑	☑			
application software	☑	☑	☑	☑			
programming software		☑	☑	☑			
appropriate use of software	☑	☑	☑	☑			
the advantages and disadvantages of different types of software	☑	☑	☑	☑			
the different file types used to support software	☑	☑		☑			

Subject Content	ICT B	Unit B061 ICT in today's world	Unit B062 Practical applications in ICT	Unit B063 ICT in context	Unit B064 Creative use of ICT	OR	Unit B065 Coding a solution
		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
Exchanging Information - Communications							
communication services	☑	☑		☑			
sharing, exchanging and managing information	☑	☑		☑			
the safe and responsible use of communication services	☑	☑	☑	☑			
communications software	☑	☑		☑			
the use of the internet	☑	☑		☑			
controlling ICT systems remotely		☑		☑			
monitoring and tracking systems	☑	☑		☑			
emerging technologies	☑	☑		☑			
use of the internet	☑			☑			

Subject Content	ICT B	Unit B061 ICT in today's world	Unit B062 Practical applications in ICT	Unit B063 ICT in context	Unit B064 Creative use of ICT	OR	Unit B065 Coding a solution
		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
Presenting Information							
types and purposes of different ways of presenting information to suit the audience	☑	☑	☑				
the use of ICT tools, media and features/facilities for presenting information with regard to efficiency and quality of work, ease of transfer, purpose and audience	☑	☑	☑				
integration between and within software applications to achieve outcomes	☑	☑	☑	☑			
Present information in ways that are fit for purpose	☑		☑				
the use of the features of software by organisations to present information	☑			☑			

Subject Content	ICT B	Unit B061 ICT in today's world	Unit B062 Practical applications in ICT	Unit B063 ICT in context	Unit B064 Creative use of ICT	OR	Unit B065 Coding a solution
		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
Manipulating Data :							
different data types	☑	☑					
the design of file & folder structures	☑	☑	☑				
design of data capture methods	☑	☑	☑				
validation	☑	☑					
verification	☑	☑					
check data accuracy and plausibility	☑		☑				
create a suitable data structure for a task	☑		☑				
the features of spreadsheet software and data handling software	☑	☑	☑	☑			
the features of modelling software	☑	☑	☑				
how a data model may be used for project planning and costing				☑			
the features, use and purpose of database software and	☑	☑	☑	☑			

data handling software							
typical tasks for which data handling software can be used	☑	☑	☑				
data modelling and management	☑	☑	☑	☑			
the use of relational databases and spreadsheets by businesses and organisations	☑	☑	☑	☑			
data handling applications	☑	☑	☑				
enter, develop and format data to suit processing purpose and audience	☑		☑				
import and export data	☑		☑				

Subject Content	ICT B	Unit B061 ICT in today's world	Unit B062 Practical applications in ICT	Unit B063 ICT in context	Unit B064 Creative use of ICT	OR	Unit B065 Coding a solution
		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
Keeping data safe and secure							
backups and archiving	☑	☑	☑	☑			
secure and safe practices in the use of ICT	☑	☑	☑	☑			
appropriate User Security methods and devices	☑	☑	☑	☑			
malicious software and the damage it can cause	☑	☑	☑				
the procedures users can take to minimise risks of damage caused by malicious software	☑	☑	☑				
how to avoid the loss/disclosure of personal data to unauthorised users		☑	☑	☑			
data encryption, when and why it is used	☑	☑		☑			

Subject Content	ICT B	Unit B061 ICT in today's world	Unit B062 Practical applications in ICT	Unit B063 ICT in context	Unit B064 Creative use of ICT	O R	Unit B065 Coding a solution
		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
Legal, social, ethical and environmental issues when using ICT							
main aspects of legislation relating to the use of ICT	☑	☑		☑			
potential health problems related to the prolonged use of ICT systems	☑	☑	☑				
the need for good design of user interfaces and their impact on the health of users	☑	☑	☑				
how ICT systems can affect the quality of life experienced by persons with disabilities		☑					
safety issues related to using computers and measures needed for prevention of accidents	☑	☑	☑				
the environmental impact of digital devices		☑		☑			
the change in working practices due to the use of ICT	☑			☑			
the use of ICT for security, monitoring, surveillance and data security	☑			☑			
the social and ethical implications of the electronic transmission of personal information		☑		☑			

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Subject Content	ICT B	Unit B061 ICT in today's world	Unit B062 Practical applications in ICT	Unit B063 ICT in context	Unit B064 Creative use of ICT	OR	Unit B065 Coding a solution
		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
Using ICT systems – How ICT systems are used							
correct procedures to start, access, exit and shutdown ICT systems	☑	☑	☑				
selection and appropriate adjustment of system settings and user preferences	☑	☑	☑				
selection and use of the features of user interfaces	☑	☑	☑				
management of folder structures and files to ensure the safe storage and retrieval of information	☑	☑	☑				
networking: components, topologies, advantages and disadvantages of networks, the use of internal and external networks	☑	☑		☑			
Information Knowledge based Systems and Expert Systems	☑			☑			

Subject Content	ICT B	Unit B061 ICT in today's world	Unit B062 Practical applications in ICT	Unit B063 ICT in context	Unit B064 Creative use of ICT	OR	Unit B065 Coding a solution
		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
Using ICT systems – Troubleshooting							
common problems encountered when using ICT systems		☑	☑				
troubleshooting activities		☑					
the difference between hardware and software problems, and how these can be solved.		☑					

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Subject Content	ICT B	Unit B061 ICT in today's world	Unit B062 Practical applications in ICT	Unit B063 ICT in context	Unit B064 Creative use of ICT	OR	Unit B065 Coding a solution
		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
Monitoring, measurement and control technology							
different types of sensor and their suitable uses	☑	☑	☑				
the advantages and disadvantages of computerised data logging	☑	☑	☑				
writing a sequence of instructions to control a screen image or external device	☑	☑	☑				
the use of ICT to control and monitor areas of everyday living:	☑	☑		☑			

Subject Content	ICT B	Unit B061 ICT in today's world	Unit B062 Practical applications in ICT	Unit B063 ICT in context	Unit B064 Creative use of ICT	OR	Unit B065 Coding a solution
		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
ICT and modern living							
how ICT systems have changed the way people go about their daily lives: communication, shopping, gaming, entertainment, education and training, banking and financial services, social networking, on-line/remote working, the advantages/benefits and disadvantages/dangers of using ICT/internet	☑	☑		☑			
the impact of emerging technologies on organisations: artificial intelligence, robotics, biometrics, vision enhancement, computer-assisted translation, quantum cryptography, 3D and holographic imaging, 3D printing, virtual reality	☑	☑		☑			

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Subject Content	ICT B	Unit B061 ICT in today's world	Unit B062 Practical applications in ICT	Unit B063 ICT in context	Unit B064 Creative use of ICT	OR	Unit B065 Coding a solution
		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
Investigating a need / Project Planning / Design							
research a given context documenting sources of information	☑		☑		☑		
analyse systematically the information requirements to solve ICT problems	☑		☑		☑		
think creatively, logically and critically throughout the development process of a set ICT-based solution	☑		☑		☑		
specify user requirements					☑		
find and select appropriate data and information that is fit for purpose, relevant and accurate	☑		☑				
work effectively with others to gain and share knowledge identify ways of improving work with others			☑	☑	☑		
plan work with others, identify objectives identify responsibilities					☑		
the way ICT facilitates collaboration and teamwork				☑			
produce / plan a design brief	☑		☑		☑		

how ICT can be used to plan and manage projects				☑			
the main stages of the project management / systems lifecycle	☑			☑			
range of systems investigation methods				☑			
system implementation strategies				☑			
produce a system specification with measurable success factors	☑		☑		☑		
explain how the proposed solution will be fit for purpose					☑		
design, create new or modify individual components for a solution					☑		
design and create screen layouts	☑				☑		
design the overall solution incorporating navigational aids create navigational aids	☑				☑		
design testing routines, test solution, users test solution	☑				☑		

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Subject Content	ICT B	Unit B061 ICT in today's world	Unit B062 Practical applications in ICT	Unit B063 ICT in context	Unit B064 Creative use of ICT	OR	Unit B065 Coding a solution
		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
Practical use of software tools to produce a working solution							
produce a fully working solution to a chosen set task	☑		☑		☑		
select and use a range of ICT tools and techniques to develop effective solutions	☑		☑				
demonstrate knowledge of software features and their use	☑		☑				
create sequences of instructions	☑		☑				
manipulate and process data and other information effectively and efficiently			☑				
integrate tools and techniques to work efficiently and to meet user needs	☑		☑				
demonstrate the application of a wide range of tools and techniques across applications to produce ICT based solutions	☑		☑				
understand and adopt safe, secure and responsible working practices when using ICT	☑		☑				

Subject Content	ICT B	Unit B061 ICT in today's world	Unit B062 Practical applications in ICT	Unit B063 ICT in context	Unit B064 Creative use of ICT	OR	Unit B065 Coding a solution
		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
Evaluation							
evaluate their and others' contribution with regard to success criteria	☑		☑		☑		
test their own solution	☑		☑		☑		
create and review their own ICT-based solution as a result of testing and improve the solution	☑		☑		☑		
review, modify and improve work as it progresses to improve the quality of the ICT-based solution	☑		☑		☑		
evaluate and amend their own solutions to a set problem	☑		☑		☑		
identify strengths and weaknesses	☑		☑		☑		
identify areas to improve and recommend and justify appropriate changes that could be made	☑		☑		☑		
present their evaluation in a relevant, clear, organised, structured and coherent format	☑		☑				
use specialist terms correctly and appropriately	☑		☑				

GCSE ICT

Subject Content	ICT B	Unit B061 **ICT in today's world**	Unit B062 **Practical applications in ICT**	Unit B063 **ICT in context**	Unit B064 **Creative use of ICT**	**OR**	Unit B065 **Coding a solution**
Coding a Solution		Written Paper	Controlled Assessment	Written Paper	Controlled Assessment		Controlled Assessment
Programming techniques							
identify and use the three basic programming constructs used to control the flow of a program: sequence, select, iterate							☑
understand and use suitable select statements							☑
understand and use suitable loops including count and condition controlled loops							☑
use different data types including Boolean, String, Integer and Real appropriately in solutions to problems							☑
define and use arrays as appropriate when solving problems							☑
Analysis – Planning the development of a coded solution to a problem.							☑
identify the information required to solve a problem							☑
produce a plan for the development of the solution							☑
specify the required hardware and software							☑

define the success criteria for later reference during evaluation							☑
participate in group work							☑
Design - Design a coded solution to a problem by developing suitable algorithms and test procedures.							☑
describe how the proposed solution will be fit for purpose							☑
design individual components of the solution							☑
design input and output formats							☑
design an overall solution using suitable algorithms							☑
design testing routines							☑
Development - Create a coded solution showing how each sub-section is completed and forms part of the whole solution, fully annotating the developed code to explain its function							
create a coded solution							☑
create systems for input to and output from the solution							☑
create navigational paths and methods							☑
create a working solution							☑
adhere to a prepared plan for their solution.							☑

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Testing - Test the solution to show functionality and how it matches the design criteria. Identify success and any limitations, describing ways the solution can be improved.							
test the solution they have produced							☑
have potential users test their solution							☑
test solutions that other people have produced							☑
Evaluation							
use the results of testing and identify the limitations of their solution							☑
use the results of testing and recommend possible improvements to their solution							☑
evaluate the solution with regard to purpose							☑
evaluate the solution with regard to the success criteria							☑
improve their solution							☑

Moving from other Awarding Bodies

Moving from Edexcel Specification 1185

The following table provides guidance for teachers transferring to the new OCR GCSE ICT for first teaching in 2010 who are currently delivering GCSE Specifications from other awarding bodies:

ICT content and form of assessment in Edexcel specification (1185)	Where this can be found in the new OCR Specification	Not contained in the new OCR Specification/Notes
LO1 Identify the constituent parts of an ICT system and their functions.	**Unit B061: ICT in today's world** **ICT Systems - Systems** Candidates should have knowledge and understanding of:	
LO2 Explain the key role of the central processing unit.	• the main components of a computer system: Central Processing Unit (CPU), internal/main memory, backing storage, input and output devices and power supplies	

LO3 Interpret the internal representation of data in an ICT system.		It is not a specific requirement in the new specification to interpret the internal representation of data in an ICT system.
LO4 Describe the key functions of the operating system.	**Unit B061: ICT in today's world** **ICT Systems - Software** Candidates should have knowledge and understanding of: • systems software: operating systems, utility software, drivers	
LO5 Use major applications packages to solve problems and describe their purpose and key features.	**Unit B062: Practical applications in ICT** **Practical use of software tools to produce a working solution** • Candidates should be able to demonstrate a practical ability to: • produce a fully working solution to a chosen set task	Not specifically required to describe purpose and key features of major application packages.

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	• select and use a range of ICT tools and techniques to develop effective solutions • understand software features and their use • create sequences of instructions • manipulate and process data and other information effectively and efficiently • integrate tools and techniques to work efficiently and to meet user needs • apply a wide range of tools and techniques across applications to produce ICT-based • solutions • understand and adopt safe, secure and responsible working practices when using ICT.	
LO6 Identify appropriate uses for, and evaluate, software.	**Unit B061: ICT in today's world** **ICT systems - Software** Candidates should have knowledge and understanding of: • appropriate uses of software (word processors, desktop publishing software, spreadsheets, database management software, multimedia software, slideshow software, web authoring software, photo-editing software, video-editing software, graphics manipulation software, • communications software) • the advantages and disadvantages of different software applications	

LO7 Recognise and use file handling terms.	**Unit B061: ICT in today's world** **Manipulating data** **Data Management** Candidates should have knowledge and understanding of: • the main issues governing the design of file structures: folders, subfolders, filenames, file types, paths, how encoding affects data entry and retrieval	
LO8 Select appropriate input, output and storage media and devices for a given application.	**Unit B061: ICT in today's world** **ICT Systems - Systems** Candidates should have knowledge and understanding of: • the main components of a computer system: Central Processing Unit (CPU), internal/main • memory, backing storage, input and output devices and power supplies. • **ICT Systems - Hardware** • the advantages and disadvantages of a variety of input, output, storage and communication devices.	
LO9 Encode data and information for computer processing and relate this operation to a given application.	**Unit B061: ICT in today's world** **Manipulating data** **Data Management** Candidates should have knowledge and understanding of: • different data types: alphanumeric, text, numeric (integer, currency, percentages, number of decimal places and fractions), date/time, limited choice (drop-down list, radio buttons, tick lists), object, logical/Boolean (Yes/No, Male/Female) types.	
LO10 Describe and use data capture operations and relate these to a given application.	**Unit B061: ICT in today's world** **Manipulating data** Candidates should have knowledge and understanding of: • the main issues governing the design of data capture methods – advantages and disadvantages of using different data capture and collection methods: forms questionnaires, online forms, chip and PIN, OMR, barcode reader, voice recognition,	

	• biometrics, and RFID tags.	
LO11 Describe and use input validation techniques and relate these to a given application.	**Unit B061: ICT in today's world** **Manipulating data** Candidates should have knowledge and understanding of: • validation: range checks, type checks, format checks, presence checks, check digits, parity checks • verification: batch totals, hash totals, double keying, visual checks.	
LO12 Specify the output for a given application.	**Unit B065: Coding a solution** **Design** Design a coded solution to a problem by developing suitable algorithms and test procedures. Candidates should be able to: • design input and output formats	Note: This is an optional unit, B065: Coding a solution, therefore students taking the other optional unit, B064: Creative use of ICT would not have to specify the output for a given application.
LO13 Present results for different target audiences and justify the methods selected.	**Unit B062: Practical applications in ICT** **Practical use of file and data structure to produce a working solution** Candidates should be able to demonstrate a practical ability to: • enter, develop and format data and information to suit processing purpose and audience. **Present their solution** Candidates should be able to demonstrate a practical ability to: • use a range of ICT tools and media to communicate data and information effectively and in a form that demonstrates a clear sense of purpose and audience • understand how information should be interpreted and presented to suit purpose and audience • present information in ways that are fit for purpose and audience.	Students are required to justify changes that they could make, rather than justify the methods they have selected.

	Evaluation Candidates should be able to demonstrate a practical ability to: • identify areas to improve and recommend and justify appropriate changes that could be made. **Unit B063: ICT in context** **Communications software** Candidates should have knowledge and understanding of: • the appropriate use of software to communicate information to different audiences.	
LO14 Specify and create the files necessary for a given application.		Not explicit in the specification, however students will have opportunity to do this through units B062 and B064/5.
LO15 Explain the need for backup procedures and identify suitable techniques.	**Unit B061: ICT in today's world** **Keeping data safe and secure** Candidates should have knowledge and understanding of: • backups and archiving: taking backups of data/programs, keeping information/archives safe, use of backing storage media • secure and safe practices in the use of ICT: protecting data from accidental destruction, • protecting data from deliberate damage • appropriate User Security methods and devices: user IDs, password, encryption, restricted physical access • malicious software and the damage it can cause: viruses, key logging software, other malware • the procedures users can take to minimise risks of damage caused by malicious software: anti-virus software, firewalls, malware detection • how to avoid the loss/disclosure of personal data to unauthorised users • what is meant by data encryption and when and why it is used.	

LO16 List and describe in outline the main aspects of systems analysis and relate these to a given application.		There is no requirement to list and describe the main aspects of systems analysis at a general level. However all students will, through which ever optional unit they choose, go through the process of analysis, design, development, testing and evaluation for their product.
LO17 Develop an algorithm (series of commands) to solve a problem.	**Unit B065: Coding a solution** **Design** Design a coded solution to a problem by developing suitable algorithms and test procedures. Candidates should be able to: • design an overall solution using suitable algorithms	Note: This is an optional unit, B065: Coding a solution, therefore students taking the other optional unit, B064: Creative use of ICT would not have to develop an algorithm to solve a problem.
LO18 Describe methods of system security.	**Unit B063: ICT in context** **Managing data/keeping data safe and secure when using ICT within a given context** Candidates should have knowledge and understanding of: • appropriate methods that could be used to make backups and archives • appropriate secure and safe practices that could be used • appropriate user security methods and devices that could be used: restricted physical access (eg biometric scans, electronic passes), restricted access to data (eg hierarchy of passwords, access rights, encryption), monitoring (eg transaction logs) • the procedures that could be used to minimise the risks of security breaches • how data encryption could be used within a defined context • the need for security of data and personal information when using ICT.	
LO19 Choose appropriate ICT systems, software tools and techniques to solve a problem.	**Unit B062: Practical applications in ICT** **Investigating a need** Candidates should be able to demonstrate a practical ability to:	

	• research a given context documenting sources of information • analyse systematically the information requirements to solve ICT problems.	
LO20 Explain the need for testing and design the testing procedures for a given application. LO21 Evaluate the solution to a problem. LO22 Document the solution to a problem.	**Unit B062: Practical applications in ICT** **Evaluation** Candidates should be able to demonstrate a practical ability to: • evaluate their own and others' contribution • test their own solution • create and review their own ICT-based solution • review and modify work as it progresses to improve the quality of the ICT-based solution • evaluate and amend their own solutions to a set problem • identify strengths and weaknesses • identify areas to improve and recommend and justify appropriate changes that could be made • present their evaluation in a relevant, clear, organised, structured and coherent format • use specialist terms correctly and appropriately.	
LO23 Demonstrate an appreciation that ICT systems should be designed to communicate with humans.	**Unit B062: Practical applications in ICT** **Practical use of file and data structure to produce a working solution** Candidates should be able to demonstrate a practical ability to: • enter, develop and format data and information to suit processing purpose and audience. **Present their solution** Candidates should be able to demonstrate a practical ability to: • use a range of ICT tools and media to communicate data and information effectively and in a form that demonstrates a	

	clear sense of purpose and audience	
	• understand how information should be interpreted and presented to suit purpose and audience	
	• present information in ways that are fit for purpose and audience.	
	Unit B063: ICT in context **Communications software** Candidates should have knowledge and understanding of:	
	• the appropriate use of software to communicate information to different audiences.	
LO25 Describe the nature of a real or imaginary system that has been modelled in an ICT system.	**Unit B061: ICT in today's world** **Manipulating data** **Data handling software** Candidates should have knowledge and understanding of:	
LO26 State the benefits and limitations of models and simulations.	• the features of modelling software: how a data model may be used to answer 'what if' questions and the benefit of being able to answer such questions using a data model	
LO27 Design and perform experiments that involve modifying the data used by a model and the rules that define a model.	• data modelling: 'what if' questions, formulae, functions, variables, modelling different	
	• scenarios, verification of results (accuracy and plausibility)	
LO28 Describe the concepts of data logging and control technology.	• emerging data handling applications: models for financial forecasting, queuing, weather	
	• forecasting, flight simulators, expert systems for decision making.	
	Candidates should have knowledge and understanding of: **Monitoring, measurement and control technology**	
	• the advantages and disadvantages of computerised data logging	
	• the use of ICT to control and monitor areas of everyday	

	living: applications that utilise data logging and control, analogue-digital conversion, control and feedback loops and the associated hardware and software.	
LO29 Use the terms local area network (LAN) and wide area network (WAN).	**Unit B063: ICT in context** **Networks** Candidates should have knowledge and understanding of: • the main components of computer networks • network topologies • the advantages and disadvantages of using computer networks • the use of internal and external networks.	
LO30 Explain the hardware and software requirements for the formation of a LAN.		
LO31 Explain the advantages and disadvantages of networked ICT systems compared to stand-alone ICT systems.		
LO32 Identify differences between network topologies.		
LO33 Identify the advantages and disadvantages of different communication methods.	**Unit B061: ICT in today's world** **Exchanging information** **Communication** • communication services: voice telephones, SMS (text messages), instant messaging, fax, email, chat rooms, forums, bulletin boards, Voice-over-IP (VoIP), video conferencing • advantages and disadvantages of using different methods of communication.	
LO34 State how data transfer speeds are apparent to the user.	**Unit B061: ICT in today's world** **Software** Candidates should have knowledge and understanding of: • communications software (eg social networking software, chat, instant messaging, web browsers, file transfer and email clients), presentation software, gaming software • the different file types used to support software: image,	There is no explicit requirement to state how data transfer speeds are apparent to the user, however this could be delivered through the unit B061 unit, software section.

	audio, video, document and executable types.	
LO35 Identify requirements for connecting to the Internet. LO36 Describe and use the key features of communications software to access the Internet. LO37 Identify the features of common Internet services. LO38 Identify the advantages and disadvantages of the Internet as a source of information.	**Unit B061: ICT in today's world** **Software** Candidates should have knowledge and understanding of: • communications software (eg social networking software, chat, instant messaging, web browsers, file transfer and email clients), presentation software, gaming software **Communications** Candidates should have knowledge and understanding of: • communication services: voice telephones, SMS (text messages), instant messaging, fax, email, chat rooms, forums, bulletin boards, Voice-over-IP (VoIP), video conferencing, • advantages and disadvantages of using different methods of communication • sharing, exchanging and managing information: sharing files, the secure transfer of data and secure access • communications software: web browsers, email software, messaging and file transfer • the use of the internet: communication, commerce, leisure and information retrieval • emerging technologies: wireless communication, WiFi, mobile technologies, Bluetooth technology, Geographical Information Systems (GIS), and other emerging connection/ communication technologies.	

ICT content and form of assessment in AQA specification (3521)	Where this can be found in the new OCR Specification	Not contained in the new OCR Specification
Section A **Tools, Techniques and Systems**		
The general structure of information systems System flowcharts		There is no requirement for students to produce system flowcharts in the new specification.
The difference between information and data		There is no requirement for students to state the difference between information and data, although this will naturally fit into delivery of the new specification.
Hardware components Input peripherals Output peripherals Storage devices and media	**Unit B061: ICT in today's world** **ICT systems** **Systems** Candidates should have knowledge and understanding of: • the main components of a computer system: Central Processing Unit (CPU), internal/main memory, backing storage, input and output devices and power supplies. **Hardware** Candidates should have knowledge and understanding of: • input devices and their appropriate use: keyboards and pads, specialist keyboards, mouse, joystick, tracker ball, touch pad, microphones, remote controls, scanners, digital cameras, webcams, touch screens, readers for bar codes, magnetic stripes and chip	

	and pin, sensors, MIDI instruments	
	• output devices and their appropriate use: monitor/screens, printers, speakers, head/earphones, digital projectors, plotters, activators	
	• storage devices and their appropriate use: hard disks, optical storage devices, magnetic tape, drives, flash memory devices.	
Operating environment The role of operating systems Types of operating systems	**Unit B061: ICT in today's world** **Software** Candidates should have knowledge and understanding of: • systems software: operating systems, utility software, drivers • appropriate uses of software.	
Data transfer	**Unit B061: ICT in today's world** **Exchanging information** **Communications** Candidates should have knowledge and understanding of: • sharing, exchanging and managing information: sharing files (file naming conventions and online safety version control), the secure transfer of data and secure access (read/write permissions).	
User interface	**Unit B061: ICT in today's world** **Hardware** Candidates should have knowledge and understanding of: • user interfaces: human-machine interfaces – graphical, command line, direct neural interface.	

Applications software	Unit B061: ICT in today's world	
The function of applications software within the system	**Software**	
The types of applications software used	• applications software: word processors, desktop publishing software, spreadsheets, database management software, multimedia software, slideshow software, web authoring software, photo-editing software, video-editing software, graphics manipulation software,	
• Database management		
• Spreadsheets		
• Charts		
• Word processing	• communications software (eg social networking software, chat, instant messaging, web browsers, file transfer and email clients), presentation software, gaming software	
• Desk top publishing		
• Drawing		
• Graphics		
• Web design	• appropriate uses of software	
	• the advantages and disadvantages of different software applications.	
	Unit B062: Practical applications in ICT **Practical use of software tools to produce a working solution**	
	• produce a fully working solution to a chosen set task	
	• select and use a range of ICT tools and techniques to develop effective solutions	
	• understand software features and their use	
	• create sequences of instructions	
	• manipulate and process data and other information effectively and efficiently	
	• integrate tools and techniques to work	

	efficiently and to meet user needs	
	• apply a wide range of tools and techniques across applications to produce ICT-based	
	• solutions	
	• understand and adopt safe, secure and responsible working practices when using ICT.	
Modelling	**Unit B061: ICT in today's world** **Manipulating data** **Data handling software** • the features of modelling software: how a data model may be used to answer 'what if' questions and the benefit of being able to answer such questions using a data model • data modelling: 'what if' questions, formulae, functions, variables, modelling different • scenarios, verification of results (accuracy and plausibility) • emerging data handling applications: models for financial forecasting, queuing, weather • forecasting, flight simulators, expert systems for decision making.	
Development of applications software	Students will have the opportunity to develop applications through the optional unit B064/5. Students will also be able to develop application software using a range of tools and techniques across applications to produce ICT-based solutions.	

Networks and communications	**Unit B063: ICT in context** **Networks** Candidates should have knowledge and understanding of: • the main components of computer networks • network topologies • the advantages and disadvantages of using computer networks • the use of internal and external networks. **Unit B061: ICT in today's world** **Exchanging information** **Communications** Candidates should have knowledge and understanding of: • communication services: voice telephones, SMS (text messages), instant messaging, fax, email, chat rooms, forums, bulletin boards, Voice-over-IP (VoIP), video conferencing, • advantages and disadvantages of using different methods of communication • sharing, exchanging and managing information: sharing files (file naming conventions and online safety version control), the secure transfer of data and secure access (read/write permissions) • the safe and responsible use of communication services: showing respect towards others, complying with data protection regulations, staying safe (disclosure of personal data, using appropriate language, misuse of	

	images)	
	• communications software: web browsers, email software, messaging and file transfer	
	• the use of the internet: communication, commerce, leisure and information retrieval	
	• controlling ICT systems remotely: remote controls, remote access to computer systems	
	• monitoring and tracking systems: worker monitoring/logging, cookies, key logging, worker call monitoring/recording, electronic consumer surveillance, mobile phone triangulation, automatic number plate recognition, CCTV cameras	
	• emerging technologies: wireless communication, WiFi, mobile technologies, Bluetooth technology, Geographical Information Systems (GIS), and other emerging connection/ communication technologies.	
E-mail	**Unit B061: ICT in today's world** **Software** Candidates should have knowledge and understanding of: • communications software (eg social networking software, chat, instant messaging, web browsers, file transfer and email clients), presentation software, gaming software.	

Evaluation of major hardware and software components of systems	**Unit B061: ICT in today's world** **ICT systems** **Hardware** • the advantages and disadvantages of a variety of input, output, storage and communication devices. **Software** • the advantages and disadvantages of different software applications.	
Gathering data	**Unit B061: ICT in today's world** **Data Management** • the main issues governing the design of data capture methods – advantages and disadvantages of using different data capture and collection methods: forms questionnaires, online forms, chip and PIN, OMR, barcode reader, voice recognition, biometrics, and RFID validation: range checks, type checks, format checks, presence checks, check digits, parity checks.	Gathering data in practice is not explicit in the specification, however students will have opportunity to do this through units B062 and B064/5.
When, where and why different methods of data capture are used	**Unit B061: ICT in today's world** **Manipulating data** **Data Management** • the main issues governing the design of data capture methods – advantages and disadvantages of using different data capture and collection methods: forms questionnaires, online forms, chip and PIN, OMR, barcode reader, voice recognition, biometrics, and RFID validation: range checks, type checks, format checks, presence checks, check	

	digits, parity checks	
	• verification: batch totals, hash totals, double keying, visual checks.	
Data logging	**Unit B061: ICT in today's world** **Monitoring, measurement and control technology** • the advantages and disadvantages of computerised data logging • the use of ICT to control and monitor areas of everyday living: applications that utilise data logging and control, analogue-digital conversion, control and feedback loops and the associated hardware and software.	
Data validation	**Unit B061: ICT in today's world** **Manipulating data** Candidates should have knowledge and understanding of: • validation: range checks, type checks, format checks, presence checks, check digits, parity checks • verification: batch totals, hash totals, double keying, visual checks.	
Security of data	**Unit B063: ICT in context** **Managing data/keeping data safe and secure when using ICT within a given context** Candidates should have knowledge and understanding of: • appropriate methods that could be used to make backups and archives • appropriate secure and safe practices	

	that could be used	
	• appropriate user security methods and devices that could be used: restricted physical access, restricted access to data (eg hierarchy of passwords, access rights, encryption), monitoring (eg transaction logs)	
	• the procedures that could be used to minimise the risks of security breaches	
	• how data encryption could be used within a defined context	
	• the need for security of data and personal information when using ICT.	
Data structures	**Unit B062: Practical applications in ICT Practical use of file and data structure to produce a working solution**	
Processing data		
Searching and matching	• use software features	
	• model situations and data to explore and develop ideas	
Sorting files		
Merging files	• enter, develop and format data and information to suit processing purpose and audience	
The different methods of processing data	• apply creative and technical skills, knowledge and understanding of ICT tools and methods to import and export data	
	• check data accuracy and plausibility	
	• create a suitable data structure for a task.	

Control	**Unit B061: ICT in today's world** **Communications**	
	• controlling ICT systems remotely: remote controls, remote access to computer systems.	
	Monitoring, measurement and control technology Candidates should have knowledge and understanding of:	
	• the different types of sensor and their suitable uses: sensors and actuators for visible, tactile, audible and other physical signals	
	• writing a sequence of instructions to control a screen image or external device: light buzzers, sound or turtle, using repeated instructions, procedures and variables	
	• the use of ICT to control and monitor areas of everyday living: applications that utilise data logging and control, analogue-digital conversion, control and feedback loops and the associated hardware and software.	
Presenting information	**Unit B061: ICT in today's world** **Presenting information**	
	• types and purposes of different ways of presenting information: word processing and desktop publishing (DTP) software, slideshow, multimedia and web authoring software	
	• the use of ICT tools and features/facilities for presenting information with regard to efficiency and quality of work, ease of transfer	

	• integration between and within software applications: integrating sections from one application into another, charts, tables, original graphics from programs into word processing files. **Unit B063: ICT in context** **Presenting information** Candidates should have knowledge and understanding of: • the integration of applications to achieve outcomes • the use of the features of software used by organisations to present information.	
Modelling and simulation	**Unit B061: ICT in today's world** **Manipulating data** **Data handling software** • the features of modelling software: how a data model may be used to answer 'what if' questions and the benefit of being able to answer such questions using a data model • data modelling: 'what if' questions, formulae, functions, variables, modelling different • scenarios, verification of results (accuracy and plausibility) • emerging data handling applications: models for financial forecasting, queuing, weather • forecasting, flight simulators, expert systems for decision making.	
The system life cycle	Students will, through which ever optional unit they choose, go through the process of	

	analysis, design, development, testing and evaluation for their product.	
Section B **Information Systems in Society**		
Communications	**Unit B061: ICT in today's world** **Communications** • advantages and disadvantages of using different methods of communication • sharing, exchanging and managing information: sharing files (file naming conventions and online safety version control), the secure transfer of data and secure access (read/write permissions) • the safe and responsible use of communication services: showing respect towards others, complying with data protection regulations, staying safe (disclosure of personal data, using appropriate language, misuse of images) • the use of the internet: communication, commerce, leisure and information retrieval **ICT and modern living** Candidates should have knowledge and understanding of: • how ICT systems have changed the way people go about their daily lives: communication, shopping, gaming, entertainment, education and training, banking and financial services, social networking, online/remote working, the advantages/benefits and disadvantages/ dangers of using	

	ICT/internet	
	• the impact of emerging technologies on organisations: artificial intelligence, robotics, biometrics, vision enhancement, computer-assisted translation, quantum cryptography, 3D and holographic imaging, 3D printing, virtual reality.	
The Data Protection Act Data misuse Copyright law and anti-hacking legislation Growth of information and its effects on society Health and safety	**Unit B061: ICT in today's world** **Legal, social, ethical and environmental issues when using ICT** Candidates should have knowledge and understanding of: • the main aspects of legislation relating to the use of ICT: the computer misuse, data protection, copyright design and patents acts and other legislation as it applies to the use of ICT • the potential health problems related to the prolonged use of ICT systems: stress, eye problems, wrist problems, Repetitive Strain Injury (RSI), back and neck problems • the need for good design of user interfaces and their impact on the health of users • how ICT systems can affect the quality of life experienced by persons with disabilities: screen filters, voice recognition software, text to voice software, customised desktop environments, Braille keyboards, specialist input devices, communication and control device, software accessibility options • a range of safety issues related to using computers and measures needed for	

	prevention of accidents: taking breaks, appropriate lighting, eye tests, wrist rests and other support devices, adjustable seating, monitor positioning, avoiding hazards, electrical safety measures • the environmental impact of digital devices: their use, deployment and eventual recycling and disposal • the social and ethical implications of the electronic transmission of personal information: monitoring/detecting loss or corruption of information, preventing the abuse of personal information, the purpose and costing of national databases, security of public data, links between public and private databases, national identity cards, CCTV, government access to personal data, the surveillance society.	

ICT content and form of assessment in AQA specification (3522)	Where this can be found in the new OCR Specification	Not contained in the new OCR Specification
The use of ICT to find, collect, process and present information Candidates should demonstrate skills in, and show knowledge and understanding of, the use of ICT to find, collect, process and present information. These should be developed and applied in a variety of contexts, ICT systems and applications for a range of purposes. This includes: • Information and data • Finding information • Collecting information • Quality of information • Information and data structures • Presenting information • Sharing and exchanging information • Modelling • Controlling	**Unit B062: Practical applications in ICT Investigating a need** Candidates should be able to demonstrate a practical ability to: • research a given context documenting sources of information • analyse systematically the information requirements to solve ICT problems • find and select appropriate data and information that is fit for purpose, relevant and accurate • work effectively with others to gain and share knowledge. **Practical use of file and data structure to produce a working solution** Candidates should be able to demonstrate a practical ability to: • use software features • model situations and data to explore and develop ideas • enter, develop and format data and information to suit processing purpose and audience • apply creative and technical skills, knowledge and understanding of ICT tools and methods to import and export data • check data accuracy and plausibility • create a suitable data structure for a task.	

	Present their solution Candidates should be able to demonstrate a practical ability to: • use a range of ICT tools and media to communicate data and information effectively and in a form that demonstrates a clear sense of purpose and audience • understand how information should be interpreted and presented to suit purpose and audience • present information in ways that are fit for purpose and audience.	
Software and hardware Candidates should demonstrate their knowledge and understanding of the function, purpose and organisation of the hardware and software, and subsystems, used in a wide range of ICT systems and applications. This includes: • Software • Hardware	**Unit B061: ICT in today's world** **ICT systems** **Systems** Candidates should have knowledge and understanding of: • the main components of a computer system: Central Processing Unit (CPU), internal/main memory, backing storage, input and output devices and power supplies. **Hardware** Candidates should have knowledge and understanding of: • input devices and their appropriate use: keyboards and pads, specialist keyboards, mouse, joystick, tracker ball, touch pad, microphones, remote controls, scanners, digital cameras, webcams, touch screens, readers for bar codes, magnetic stripes and chip and pin, sensors, MIDI instruments • output devices and their appropriate use: monitor/screens, printers, speakers, head/earphones, digital projectors, plotters, activators	

	storage devices and their appropriate use: hard disks, optical storage devices, magnetic tape, drives, flash memory devices.	
Using ICT to solve problems Candidates should demonstrate skills in, and show knowledge and understanding of, the use of ICT to meet particular needs and solve problems, including the analysis, design, documentation, implementation, testing and evaluation of effective working ICT systems for use by themselves and others. This includes: • The systems life cycle • The development of ICT systems and subsystems • The development and testing of sequences of instructions • Documentation • The appropriateness of ICT systems and subsystems	Students will cover this section through which ever optional unit they choose. In both of these units students go through the process of analysis, design, development, testing and evaluation for their product. **Unit B064: Creative use of ICT** – use a range of creative software applications to create a multimedia solution to a given problem. **Unit B065: Coding a solution** – identify a potential coded solution to a problem using basic programming techniques.	Students choosing optional route B064: Creative use of ICT may not develop and test a sequence of instructions.
The effects of using ICT Candidates should: • reflect critically on the use of ICT by themselves and others; • discuss and review the wider implications and effects of ICT, including the spiritual, moral, social, cultural, economic, political, legal, and ethical issues involved in the relationships between ICT and individuals, organisations and societies throughout the world. This includes: • The relationship between ICT and society • Security	**Unit B062: Practical applications in ICT Evaluation** Candidates should be able to demonstrate a practical ability to: • evaluate their own and others' contribution. . **Unit B061: ICT in today's world** **Legal, social, ethical and environmental issues when using ICT** Candidates should have knowledge and understanding of: • the main aspects of legislation relating to the use of ICT: the computer misuse, data protection, copyright design and patents acts and other legislation as it applies to the use of ICT	

	- the potential health problems related to the prolonged use of ICT systems: stress, eye problems, wrist problems, Repetitive Strain Injury (RSI), back and neck problems - the need for good design of user interfaces and their impact on the health of users - how ICT systems can affect the quality of life experienced by persons with disabilities: screen filters, voice recognition software, text to voice software, customised desktop environments, Braille keyboards, specialist input devices, communication and control device, software accessibility options - a range of safety issues related to using computers and measures needed for prevention of accidents: taking breaks, appropriate lighting, eye tests, wrist rests and other support devices, adjustable seating, monitor positioning, avoiding hazards, electrical safety measures - the environmental impact of digital devices: their use, deployment and eventual recycling and disposal - the social and ethical implications of the electronic transmission of personal information: monitoring/detecting loss or corruption of information, preventing the abuse of personal information, the purpose and costing of national databases, security of public data, links between public and private databases, national identity cards, CCTV, government access to personal data, the surveillance society.	

ICT content and form of assessment in WJEC specification	Where this can be found in the new OCR Specification	Not contained in the new OCR Specification
INFORMATION TECHNOLOGY – USE AND IMPACT ON SOCIETY (ai) Experience of Information Retrieval (aii) Experience the retrieval of information from the Internet and from multi-media CD-ROMs (b) Experience of a Spreadsheet package (c) Experience of a Word Processing package (d) Experience of a Desk Top Publishing package	**Unit B062: Practical applications in ICT** **Investigating a need** Candidates should be able to demonstrate a practical ability to: • find and select appropriate data and information that is fit for purpose, relevant and accurate. **Unit B061: ICT in today's world** **Software** • applications software: word processors, desktop publishing software, spreadsheets, database management software, multimedia software, slideshow software, web authoring software, photo-editing software, video-editing software, graphics manipulation software.	
INFORMATION PROCESSING (a) Data, Information and Knowledge (b) The advantages and disadvantages of using Information and Communication Technology for storing, processing and transmission of data (c) Methods for securing data	**(a) see next column** **(b) see next column** **(c) Unit B061: ICT in today's world** **Keeping data safe and secure** Candidates should have knowledge and understanding of: • backups and archiving: taking backups of data/programs, keeping information/archives safe, use of backing storage media • secure and safe practices in the use of	(a) There is no requirement for students to state the difference between information, data and knowledge, although this will naturally fit into delivery of the new specification. (b) This new specification does not explicitly require students to state advantages and disadvantages of using Information and Communication Technology for storing, processing and transmission of data. However it does require that students know the advantages and disadvantages of ICT

	ICT: protecting data from accidental destruction, protecting data from deliberate damage	systems, hardware, software and networked systems.
	• appropriate User Security methods and devices: user IDs, password, encryption, restricted physical access (eg biometric scans, electronic passes), restricted access to data, monitoring malicious software and the damage it can cause: viruses, key logging software, other malware	
	• the procedures users can take to minimise risks of damage caused by malicious software: anti-virus software, firewalls, malware detection	
	• how to avoid the loss/disclosure of personal data to unauthorised users	
	• what is meant by data encryption and when and why it is used.	
THE IMPLICATIONS OF THE USE OF ICT Candidates should be able to identify the implications of the use of ICT for individuals, organisations and society in each of the following areas: (a) ICT used by retail services (b) Identify the technology responsible for the replacement of cash (c) Communications Services (d) The Electronic Office (e) ICT in the home & leisure activities (f) Education	**Unit B061: ICT in today's world** **ICT and modern living** Candidates should have knowledge and understanding of: • How ICT systems have changed the way people go about their daily lives: communication, shopping, gaming, entertainment, education and training, banking and financial services, social networking, online/remote working, the advantages/benefits and disadvantages/ dangers of using ICT/internet.	
THE IMPACT OF ICT Candidates should be able to reflect critically on the impact of ICT on their own lives and others', considering the social, economic, political, legal, ethical and moral issues.	**Unit B061: ICT in today's world** **Legal, social, ethical and environmental issues when using ICT** Candidates should have knowledge and understanding of: • the main aspects of legislation relating to	The new specification does not explicitly cover the impact of ICT on political issues.

	the use of ICT: the computer misuse, data protection, copyright design and patents acts and other legislation as it applies to the use of ICT	
	• the potential health problems related to the prolonged use of ICT systems: stress, eye problems, wrist problems, Repetitive Strain Injury (RSI), back and neck problems	
	• the need for good design of user interfaces and their impact on the health of users	
	• how ICT systems can affect the quality of life experienced by persons with disabilities: screen filters, voice recognition software, text to voice software, customised desktop environments, Braille keyboards, specialist input devices, communication and control device, software accessibility options	
	• a range of safety issues related to using computers and measures needed for prevention of accidents: taking breaks, appropriate lighting, eye tests, wrist rests and other support devices, adjustable seating, monitor positioning, avoiding hazards, electrical safety measures	
	• the environmental impact of digital devices: their use, deployment and eventual recycling and disposal	
	• the social and ethical implications of the electronic transmission of personal information: monitoring/detecting loss or corruption of information, preventing the abuse of personal information, the purpose and costing of national databases, security of public data, links	

	between public and private databases, national identity cards, CCTV, government access to personal data, the surveillance society.	
PROBLEM SOLVING Problem solving using ICT	Students will cover this section through which ever optional unit they choose. In both of these units students go through the process of analysis, design, development, testing and evaluation for their product. **Unit B064: Creative use of ICT** – use a range of creative software applications to create a multimedia solution to a given problem. **Unit B065: Coding a solution** – identify a potential coded solution to a problem using basic programming techniques.	
INFORMATION TECHNOLOGY - APPLICATIONS Candidates must demonstrate knowledge and understanding of the range and scope of information processing applications and the techniques and systems, including the software and hardware subsystems, needed to support them.	**Unit B061: ICT in today's world** **Software** Candidates should have knowledge and understanding of: • applications software: word processors, desktop publishing software, spreadsheets, database management software, multimedia software, slideshow software, web authoring software, photo-editing software, video-editing software, graphics manipulation software.	
CONTROLS ON DATA (a) The methods used to gather, store, process and present information in a number of applications (b) The advantages and disadvantages of using computers in the given application (c) Validation and verification (d) The need for verification and validation (e) Know the methods used for validation and	**Manipulating data** **Data Management** Candidates should have knowledge and understanding of: • different data types: alphanumeric, text, numeric (integer, currency, percentages, number of decimal places and fractions), date/time, limited choice (drop-down list, radio buttons, tick lists), object,	

	logical/Boolean (Yes/No, Male/Female) types	
STORING INFORMATION (a) Data types (b) Define a field (c) Define fixed and variable length fields (d) Define a record (e) Define a file (f) Uses of files (g) Database (h) Consider file size and its implications for storage (i) The use of compression, its advantages and disadvantages. How data encoded in suitable formats affects file size and ease of retrieval (j) Physical and software methods of securing data	• the main issues governing the design of file structures: folders, subfolders, filenames, file types, paths, how encoding affects data entry and retrieval • presence checks, check digits, parity checks • verification: batch totals, hash totals, double keying, visual checks. **Data handling software** Candidates should have knowledge and understanding of: • the features of spreadsheet software: cells, cell references, rows, columns, show row/column labels, enter and edit cell content, key fields, cell gridlines, cell ranges, replication, formatting, merging cells, formulae, functions, automatic recalculation, sorting rows/columns, graph/chart, creation and development to suit numerical information, layout of worksheets and linked sheets	Compression is not explicitly addressed in the new specification.
MANIPULATING INFORMATION (a) Organising and updating files (b) How to search and select information (c) How to develop information (d) How to present information	• the features of modelling software: how a data model may be used to answer 'what if' questions and the benefit of being able to answer such questions using a data model • the features of database software: field (column) and record (row), field names, key field (unique), primary key, file; create a database, insert/delete field/record, enter and edit field contents, organise and select records, view database structure, control the content of reports by selection of fields and use of headings, control the format of reports (header and footer), • creation and development of	

	charts/graphs	
	• typical tasks for which data handling software can be used: organising data, collecting data, amending existing data, deleting redundant data, select/search/filter records, sort on one or more fields (in ascending and descending order), merging data, report production	
	• data modelling: 'what if' questions, formulae, functions, variables, modelling different	
	• scenarios, verification of results (accuracy and plausibility)	
	• the use of relational databases and spreadsheets: flatfile vs relational databases	
	• emerging data handling applications: models for financial forecasting, queuing, weather	
	• forecasting, flight simulators, expert systems for decision making.	
HARDWARE (a) Types of computer (b) Computer memory (c) Storage devices (d) Input devices (e) Output devices	**Unit B061: ICT in today's world** **ICT systems** **Systems** Candidates should have knowledge and understanding of: • the main components of a computer system: Central Processing Unit (CPU), internal/main memory, backing storage, input and output devices and power supplies • a range of common applications where microprocessor technology is used: personal computers, mainframe computers, super computers and embedded systems • the difference between hardware and	

	software.	
	Hardware Candidates should have knowledge and understanding of: • input devices and their appropriate use: keyboards and pads, specialist keyboards, mouse, joystick, tracker ball, touch pad, microphones, remote controls, scanners, digital cameras, webcams, touch screens, readers for bar codes, magnetic stripes and chip and pin, sensors, MIDI instruments • output devices and their appropriate use: monitor/screens, printers, speakers, head/earphones, digital projectors, plotters, activators • storage devices and their appropriate use: hard disks, optical storage devices, magnetic tape, drives, flash memory devices • communication devices and their appropriate use: modems, routers, hubs, network interface cards in fixed and mobile systems • the advantages and disadvantages of a variety of input, output, storage and communication devices • user interfaces: human-machine interfaces – graphical, command line, direct neural interface.	
SOFTWARE (a) Operating systems, functions of an operating system, different types of operating systems (b) System security (c) User interface	**Unit B061: ICT in today's world** **Software** Candidates should have knowledge and understanding of: • systems software: operating systems, utility software, drivers.	

	Hardware	
	• user interfaces: human-machine interfaces – graphical, command line, direct neural interface.	
	Unit B063: ICT in context **Legal, social, ethical and environmental issues when using ICT within context** Candidates should have a knowledge and understanding of:	
	• the use of ICT for security, monitoring, surveillance and data security.	
NETWORKS (a) Types of network (b) Network security (c) Advantages of networks (d) Data transmission	**Unit B063: ICT in context** **Networks** Candidates should have knowledge and understanding of:	There is no requirement in the new specification for students to understand data transmission in technical detail.
	• the main components of computer networks	
	• network topologies	
	• the advantages and disadvantages of using computer networks	
	• the use of internal and external networks.	
	Managing data/keeping data safe and secure when using ICT within a given context Candidates should have knowledge and understanding of:	
	• appropriate methods that could be used to make backups and archives	
	• appropriate secure and safe practices that could be used	
	• appropriate user security methods and devices that could be used: restricted physical access, restricted access to data (eg hierarchy of passwords, access rights, encryption), monitoring (eg transaction logs)	
	• the procedures that could be used to	

	minimise the risks of security breaches • how data encryption could be used within a defined context • the need for security of data and personal information when using ICT.	
SYSTEMS ANALYSIS (a) The four stages involved in the analysis, design, implementation and maintenance of a system (b) Information systems in society: Data Protection Act. Copyright law and the Computer Misuse Act.		

Key similarities and the key differences between the OCR specification and other awarding body specifications (Edexcel, AQA, WJEC)

Edexcel

	Edexcel Specification Full Course	OCR Specification Full Course	Common areas of taught content, structure and assessment between the Edexcel and OCR specifications	Key differences of taught content, structure and assessment between Edexcel and OCR specifications
Content	**Edexcel** **UNIT 1: Living in a Digital World** Impact of digital technology current and emerging digital technologies and the issues raised by their use Risks of using ICT/safe, secure and responsible practice. **UNIT 2: Using Digital Tools** Practical unit to broaden and enhance ICT skills and capability. Use a range of digital tools and techniques to produce effective ICT solutions in a range of contexts. Reflect critically on their own and others' use of ICT and to adopt safe, secure and	**OCR** **Unit B061: ICT in today's world** Study of a range of ICT systems, Impact of current and emerging technologies and their impact on themselves and others. **Unit B062: Practical applications in ICT** Practical unit to develop students practical ICT skills and demonstrate their ability. **Unit B063: ICT in context** Study of a range of ICT systems, components, technologies and applications. **Unit B064: Creative use of ICT**	Unit 1/Unit B061 is the same in terms of content for both awarding body specifications. Unit 2 of the Edexcel specification and Units B062/B063 of the OCR specifications are the same in terms of content.	The OCR specification provides explicit opportunities for students to develop their creative or programming skills in the optional units B064/B065 of which students must choose one. Edexcel's unit 2, using digital tools, topic 3, digital publishing does provide opportunity for students to develop a digital publication. However there are no explicit opportunities for students to develop programming skills.

	responsible practice.	Study of a range of creative software applications (web design/multimedia/computer game) to create a solution to a given problem. Problem analysis, design, development, testing and evaluation the solution. **Unit B065: Coding a solution** Basic programming techniques to code a potential solution (scenario will be sufficiently open to allow a variety of viable solutions)		
Structure	**Edexcel** Two mandatory units: Unit 1 - 40% Unit 2 - 60% Note: Edexcel also offer the GCSE ICT as a double award, with two additional units.	**OCR** Four units Three mandatory units plus choose one from two optional units: Unit B061 – 20% Unit B062 – 30% Unit B063 – 20% Unit B064/B065 - 30% Note: Short course is also available from OCR which consists of units B061 and B062.		Both units from the Edexcel specification are mandatory, OCR have three mandatory units and choose one optional unit from a choice of two, Creative use of ICT or Coding a solution.
Assessment	**Edexcel** External assessment 1 x 90 mins Controlled assessment 1 x 40 hrs Total assessment time 41.5 hrs	**OCR** External assessment 2 x 60 mins Controlled assessment 2 x 20 hrs Total assessment time 42 hrs **Unit B061**	Total assessment time for Edexcel and OCR are similar, 41.5 hours for Edexel and 42 hours for OCR.	OCR offers a computer-based examination in addition to the paper-based version. Centres may choose which suits their needs best.

	Unit 1 Externally assessed written paper, 90 mins **Unit 2** Controlled assessment, 40 hours.	Externally assessed written or computer-based test, 60 mins **Unit B062** Controlled assessment, 20 hours **Unit B063** Externally assessed written or computer-based test, 60 mins **Unit B064/B065** Controlled assessment, 20 hours		

AQA

	AQA Specification Full Course	OCR Specification Full Course	Common areas of taught content, structure and assessment between the AQA and OCR specifications	Key differences of taught content, structure and assessment between AQA and OCR specifications
Content	**Section 1: Current and emerging technologies** Explore the impact of current and emerging technologies in a variety of contexts. **Section 2: ICT tools and techniques** Explore the ways tools and techniques are used to develop ideas and solve problems. **Section 3: Society's use of ICT** Explore legal, social,	**Unit B061: ICT in today's world** Study of a range of ICT systems, Impact of current and emerging technologies and their impact on themselves and others. **Unit B062: Practical applications in ICT** Practical unit to develop students practical ICT skills and demonstrate their ability. **Unit B063: ICT in context**	This specification does not directly link the unit content with the assessment Section 1 and 2 (AQA) and Unit B061 and B062 (OCR) are the same in terms of content for both awarding body specifications. Section 3 of the AQA specification is covered in Units B061/B063 of the OCR specification. Section 4 of the AQA	The AQA specification is set out in a different way than other specifications. It is split into 4 sections which are assessed in 3 units. In addition to the content provided in the AQA specification, the OCR specification also provides explicit opportunities for students to develop their creative or programming skills in the optional units B064/B065 of which students must choose one.

	economic, ethical and environmental implications of the use of ICT. **Section 4: Collaborative working** Develop an understanding of project management, homeworking and collaboration using ICT.	Study of a range of ICT systems, components, technologies and applications. **Unit B064: Creative use of ICT** Study of a range of creative software applications (web design/multimedia/computer game) to create a solution to a given problem. Problem analysis, design, development, testing and evaluation the solution. **Unit B065: Coding a solution** Basic programming techniques to code a potential solution (scenario will be sufficiently open to allow a variety of viable solutions)	specification is covered in the project planning section of unit B063 of the OCR specification.	
Structure	Three mandatory units Unit 1 - 40% Unit 2 - 30% Unit 3 – 30% Note: AQA offer the single award only.	Four units Three mandatory units plus choose one from two optional units: Unit B061 – 20% Unit B062 – 30% Unit B063 – 20% Unit B064/B065 - 30% Note: Short course is also available from OCR which consists of units B061 and B062.	The weightings for the two controlled assessment units for both AQA and OCR are the same. AQA has one externally assessed unit with a 40% weighting and OCR have two, each weighted at 20%.	All units from the AQA specification are mandatory, OCR have three mandatory and choose one optional from a choice of two, Creative use of ICT or Coding a solution.
Assessment	**AQA** External assessment 1 x 90 mins Controlled assessment 2 x 25	**OCR** External assessment 2 x 60 mins Controlled assessment 2 x 20	AQA has one external assessment split into three sections which is taken in one exam slot. OCR has two separate external	OCR offers a computer-based examination in addition to the paper-based version. Centres may choose which suits their needs best.

hrs Total assessment time 51.5 hrs **Unit 1** Externally assessed written paper, 90 minutes. Exam is broken down into three sections: **A:** 10 structured compulsory questions **B:** 3 structured compulsory questions (short and extended answers) **C:** choice of 1 essay question from 2 **Unit 2** Controlled assessment, 25 hours **Unit 3** Controlled assessment, 25 hours	hrs Total assessment time 42 hrs **Unit B061** Externally assessed written or computer-based test, 60 minutes **Unit B062** Controlled assessment, 20 hours **Unit B063** Externally assessed written or computer-based test, 60 mins **Unit B064/B065** Controlled assessment, 20 hours	assessments which are taken separately.	Total assessment time is 42 hours for OCR compared to 51.5 hours for AQA. There is only one external examination for WJEC, compared to OCR's two.

	WJEC Specification Full Course	OCR Specification Full Course	Common areas of taught content, structure and assessment between the WJEC and OCR specifications	Key differences of taught content, structure and assessment between WJEC and OCR specifications
Content	**Unit 1: Understanding ICT** Covers the KS4 PoS ICT and the functional elements of ICT in a home and school context. **Unit 2: Solving Problems with ICT** Practical aspects of the functional elements of ICT - obtain and interpret different types of information; use, develop and communicate information and present work. **Unit 3: ICT in Organisations** Study of the 'application' content of ICT in a business and industry context. **Unit 4: Developing Multimedia ICT Solutions** Develop a piece of work using multimedia software.	**Unit B061: ICT in today's world** Study of a range of ICT systems, Impact of current and emerging technologies and their impact on themselves and others. **Unit B062: Practical applications in ICT** Practical unit to develop students practical ICT skills and demonstrate their ability. **Unit B063: ICT in context** Study of a range of ICT systems, components, technologies and applications. **Unit B064: Creative use of ICT** Study of a range of creative software applications (web design/multimedia/computer game) to create a solution to a given problem. Problem analysis, design, development, testing and	Units 1 to 4 of the WJEC specification and Units B061 to B062 of the OCR specification are similar in terms of taught content, other than the OCR specification provides more detail than does the WJEC specification.	In addition to the content provided in the WJEC specification, the OCR specification also provides explicit opportunities for students to develop programming skills in the optional unit B065.

		evaluation the solution. **Unit B065: Coding a solution** Basic programming techniques to code a potential solution (scenario will be sufficiently open to allow a variety of viable solutions)		
Structure	Four mandatory units: Unit 1 - 20% Unit 2 - 30% Unit 3 – 20% Unit 4 – 30% Note: Short course is also available from WJEC which consists of units 1 and 2.	Four units Three mandatory units plus choose one from two optional units: Unit B061 – 20% Unit B062 – 30% Unit B063 – 20% Unit B064/B065 - 30% Note: Short course is also available from OCR which consists of units B061 and B062.	The weightings for each of the four units are the same for both WJEC and OCR.	All units from the WJEC specification are mandatory, OCR have three mandatory and choose one optional from a choice of two, Creative use of ICT or Coding a solution.
Assessment	**WJEC** External assessment 2 x 90 mins Controlled assessment 2 x 22.5 hrs Total assessment time 48 hrs **Unit 1** Externally assessed, 90 minutes **Unit 2** Controlled Assessment: 22½ hrs **Unit 3**	**OCR** External assessment 2 x 60 mins Controlled assessment 2 x 20 hrs Total assessment time 42 hrs **Unit B061** Externally assessed written or computer-based test, 60 minutes **Unit B062** Controlled assessment, 20 hours	WJEC and OCR both have two external assessments and two controlled assessments.	OCR offers a computer-based examination in addition to the paper-based version. Centres may choose which suits their needs best. The timings for each awarding body differ with WJEC's at 48 hours compared to OCR's 42 hours.

External Assessment: 1Y:! hours	**Unit 8063** Externally assessed written or computer-based test, 60 mins
Unit4 Controlled Assessment: 22Y:! hrs	**Unit 8064/8065** Controlled assessment, 20 hours

4   Teacher hints and tips

Innovative ideas for teaching/delivery and imaginative classroom activities to engage candidates of all ability ranges.

There are many ways to bring the OCR GCSE ICT specification to life. Below are some examples taken from QIA, the Excellence Gateway. These resources show good examples of how to engage candidates of all ability ranges.

The QIA resources include activities, case studies and suggested approaches to delivering ICT in an engaging way as well as an 'instant inspirations' section to appeal to a wide range of students.

These resources, activities and approaches have been tried and tested by teachers, tutors and trainers.

The resources which would engage GCSE ICT students following the OCR specification have been identified below and have been most closely matched with the relevant unit. However many of the activities could cross over to other units:

OCR GCSE ICT Unit	Example of resources to engage students from http://tlp.excellencegateway.org.uk/resource/IT_CD_6014Q/instantinspiration/default.htm
Unit B061: ICT in today's world Study of a range of ICT systems, Impact of current and emerging technologies and their impact on themselves and others.	**Instant Inspirations:** **Input/output jigsaw** Make a jigsaw to identify different input and output devices (Case study: Managing information systems: Sainsbury's) **Jargon buster** Put learners in control of cutting through IT jargon by appointing a 'chief jargon buster'. Video clip: Active learning: moving forwards Language loops **Language loops** Appreciating that words in common usage may mean something different in IT. **Word snap** Spotting IT terms that have similar meanings (Download video clip: Using the Word snap activity) Lucky dip - A flexible activity used to encourage learners to develop their communication skills. **Extended activities:** **Investigating accessibility** Exploring a set of features of a website from the perspective of users with different accessibility needs. Related resources: Case study: Running an online business: Extreme Sports **Mia's Sandwich Shop and beyond** Activities linked to the original Mia's Sandwich Shop activity, focussing on the management of information flows. Related resources: Video clip: Using the Mia's Sandwich Shop resource

Unit B062: Practical applications in ICT Practical unit to develop students practical ICT skills and demonstrate their ability.	**Instant Inspirations:** **Card creator** This activity builds on the personal interest of the learner to help them to understand simple database theory. (Activity: From chaos to database - in new directions) **Data dash** A quick practical activity to help learners appreciate why computers are useful for organising information. **Human data sort** A data-sorting exercise with a twist, to develop understanding of basic database theory (Download Video clip: Adapting From chaos to database) **Extended activities:** **Data checkpoint** Introduces some of the basic principles of data validation. Related resources: Instant inspiration: Jargon buster **From chaos to database - in new directions** Activities linked to the original From chaos to database resources. Related resources: Video clip: Adapting the resources **Data comfort zones** Exploring the issues surrounding personal information and data sensitivity. Related resources: Instant inspiration: Traffic lights **Holding personal data - the risks** This dominoes-based activity invites learners to discuss issues that must be considered when personal data is held on a computer. Related resources: Case study: Using a customer tracking system: FitLinxx
Unit B063: ICT in context Study of a range of ICT systems, components, technologies and applications.	QIA have provided commercial **case studies** which would engage students in this unit, seeing how ICT is used in the context of these sports and retail industries: **Running an online business: Extreme Sports World** This case study shows how IT is used in an online business. Topics include designing a website, running the online ordering process and managing stock. Learners are given the opportunity to suggest how they would improve the company's processes. Related resources - video clip: using the Extreme Sports World case study **Using a customer tracking system: FitLinxx** This case study shows how the gym uses an IT system to track a customer's progress, and considers how the same technology is used for marketing and customer services purposes. It also looks at data sensitivity issues and the advantages of giving customers remote access. Related resources - video clip: making the most of the FitLinxx case study **Managing information systems: Sainsbury's** IT provides the invisible ingredient for success in this case study which follows the lifecycle of a sandwich from conception to purchase. Learners discover the IT systems, information flow and staff roles that keep a national retailer efficient and profitable. Related resources Activity: Mia's Sandwich shop and beyond

Unit B064: Creative use of ICT	Instant Inspirations:
Study of a range of creative software applications (web design/multimedia/computer game) to create a solution to a given problem. Problem analysis, design, development, testing and evaluation the solution.	**Washing line** A simple technique to illustrate the importance of planning (Download Case study: Managing information systems: Sainsbury's) **Discussion diamond** Using the Diamond 9 activity to explore a chosen topic. **Traffic lights** Use traffic light cards to aid feedback and participation. **Wonder wall** Giving learners the space to ask questions. **Extended activity:** **DIY documentary** Enables learners to create their own video sequences. Related resources: Case study: Managing information systems: Sainsbury's
Unit B065: Coding a solution Basic programming techniques to code a potential solution (scenario will be sufficiently open to allow a variety of viable solutions)	**Instant Inspirations:** **Flashlight binary** The worlds of computer science and espionage collide, as learners practice sending information by torchlight. **Stuck sheets** Encourage learners to analyse and solve problems themselves.

5 Resources

This section provides suggestions of suitable resources. The list is neither prescriptive nor exhaustive, and candidates should be encouraged to gather information from a variety of sources. Some suggested resources are intended for Tutor use. The resources in this section were correct at the time of production.

General Resources for B061 and B063

- A glossary of computing terms : The British Computing Society

- The official OCR text for this course with coverage of all five units.

  Steve Cushing, Brian Gillinder, and George Rouse: OCR Information and Communication Technology GCSE) Hodder education ISBN: 9781444108644
  There is an accompanying set of teacher resources including teacher notes, information sheets and exercises. There is also a linked web site with extra useful teaching resources.

- www.teach-ICT.com: Lots of useful resources and theory coverage as well as video tutorials for most major applications which are particularly useful for units B062 and B064

- A good English dictionary

- BBC bitesize has lots of useful general ICT support and is particularly relevant to B061. The topics covered provide a good match to the published specification for this unit.

  http://www.bbc.co.uk/schools/gcsebitesize/ict

- Computer Science Unplugged: Set of exercises from Canterbury University in New Zealand. The current exercises include ones on Image representation, text compression, error detection and cryptography all relevant to B061 and provide good extension material to enhance the teaching of various topics beyond the basic specification.

  http://csunplugged.com/

- CS4Fn: Free magazine and website from Queen Mary College, London. This magazine and site provides stimulating material to enhance the students appreciation of computer science and ICT through fun articles and activities. Some of the material is relevant to potential scenarios for unit B063, but it is largely what it claims to be, fun computer science.

  http://www.cs4fn.org

- Wikipedia contains useful information related to all topics covered within this specification.

  http://en.wikipedia.org/

Books covering most major aspects of B061 and B063

The following books provide general support for various sections of B061 and B063. While these texts are not specifically linked to this specification they can supplement the material found in the course text in order to study a specific topic in more depth or from a different viewpoint. These texts may prove useful in providing supplementary detail for unit B063 scenarios.

- Banks, Harber-Stuart & Parry. *GCSE Applied ICT - Double Award* Folens. ISBN: 1843033704

- Nicola Bowman, Ann Jones *OCR National Level 2 in ICT* Hodder education ISBN: 9780340942017

- Steve Cushing; Keith Parry; Ruksana Patel; Anne Kelsall; Graham Manson ICT for OCR National Level 2 Student Book: Unit 1 ICT skills for business and Unit 21 Creating computer graphics: Units 1 and 21 Student Book (OCR Nationals in ICT Level 2) Payne Gallway

- Denise Walmsley, Brian Sargent, Brian Gillinder *Information and Communications Technology for GCSE Second Edition* hodder education ISBN: 9780340883082

- Denise Walmsley, Brian Sargent and Alun Hinder *Information and Communication Technology for GCSE and Information and Communication Technology for GCSE Foundation*

- *GCSE ICT Complete revision and practice* CGP

- Sean O'Byrne Letts *GCSE Visual Revision guide Success ICT*

Unit B062: Practical applications in ICT

Unit B062 is a controlled assessment unit and practical skills need to be developed in order to complete the work. Much will depend upon the assessment chosen but general 'office software skills will inevitably play a major part in the development of the work for this unit.

- Zigzag publishing produce a large selection of suitable skills development materials.

  http://zigzageducation.co.uk/

- Information Systems for You - Skillbuilder Office XP Edition (Nelson Thornes) is specifically aimed at developing skills with Microsoft office

- Teach ICT has several useful free video tutorials for most major applications and allows students to select support for specific skills with many applications in an easy to follow visual presentation. These tutorials are particularly valuable for students working on unit B062.

  www.teach-ICT.com

- San Pedro International University also provides tutorials to support the use of various office applications. It was developed to support their work with the IGCSE but is also a valuable resource for unit B062.

  www.ictgcse.net

The following books have sections that may be appropriate in both developing skills and relating skills and the practical application of those skills.

- Stephen Doyle ICT For You – OCR Coursebook, (Nelson Thornes)

- Stephen Doyle ICT For You – OCR Teacher support pack, (Nelson Thornes)

- Stephen Doyle ICT For You Live, (Nelson Thornes)

- Brian Gillinder, Ian Paget, Brian Sargent and Denise Walmsley Information and Communication Technology for OCR GCSE, (Hodder)

- Alan Clarke OCR Functional Skills ICT Student Book, (Hodder)

- Nicola Bowman and Ann Jones OCR National Level 2 in ICT with Dynamic Learning CD-ROM, (Hodder)

- Michael A. Dispezio, Myron Miller Critical thinking puzzles,

- Cushing, Parry, Patel, Kelsall and Manson ICT for OCR National Level 2 Student Book, Payne-Gallway

- GCSE ICT – The Revision Guide and Workbook: CGP

- GCSE Success ICT Revision Guide and Workbook: Letts

Unit B064: Creative use of ICT

- Teach ICT has several useful tutorials for most major applications as well as some support for web authoring and game writing including a full scheme of work for using gamemaker.

  www.teach-ICT.com

- GameMaker is an excellent game writing system ideally suited to the game scenario for unit B064. There is a lot of support and guidance available for this product.

  http://www.yoyogames.com/gamemaker

- Alice: learning environment from Carnegie Mellon is a fascinating programming environment suited to the development of excellent and finely controlled animations. The finished product has the look of the well known SIMS environment and it is ideally suited to the creation of multimedia presentations for unit B064.

  http://www.alice.org/

- Scratch: Great resource from MIT for introducing programming that uses colour coded snap together blocks to create sequences of instructions. It is a good starting point for developing the logical programming processes not hindered by the syntax barrier. It can be used to develop quite complex games for unit B064 game option. There is a vast amount of support material available for this product.

  http://scratch.mit.edu/

- Ambrosine List of free game developer sites and resources that will provide excellent support for students completing the B064 game option.

  http://www.ambrosine.com/index.php

- Dick Baldwin: some excellent SCRATCH tutorials for unit B064 game option.

  http://www.dickbaldwin.com/

- Audacity is an excellent free sound editing system that can be used to work with sound files as part of the B064 multimedia option and possibly with the B064 game option if a soundtrack is used.

  http://audacity.download-latest.com/

- RoboMind: Programmable robot environment designed to introduce programming concepts in an easy and enjoyable way. This is a particularly good way to introduce programming concepts for the B064 game option and B065.

  http://www.robomind.net/en/index.html

- Zigzag publishing produce a large selection of materials targeted at developing skills with multimedia presentations including the material for the iMedia courses, OCR Nationals.

  http://zigzageducation.co.uk/

Unit B065: Coding of solution

- BBC BASIC for windows: Easy to use programming language with lots of support. It can be used in console mode in order to clarify the programming processes without the need for complex syntax. This is an excellent way to introduce the programming concepts required for unit B065 and can also be used to solve the problems set in many of the controlled assessments.

  http://bbcbasic.co.uk

- Computer Science Unplugged: Set of exercises from Canterbury University in New Zealand. There are several exercises linked to algorithms coding and programming in general to enhance the understanding of the work developed in unit B065

  http://csunplugged.com/

- Computing at schools group: Lots of support including teaching units for programming skills and other resources suited to unit B065.

  http://www.computingatschool.org.uk

- D F Stermole website: Resources to support programming in various languages including Pascal, Java C etc plus an excellent introduction to key programming techniques in the Turing pages.

  http://www.dfstermole.net/

- Dick Baldwin: Programming tutorials for various languages including some excellent SCRATCH tutorials.

  http://www.dickbaldwin.com/

- FreePascal: Programming language. Pascal is an easy to use console programming environment ideally suited to beginner programmers. The skills developed with Pascal can be easily transferred to various languages. The language can be used for skills development and can also be used to solve many of tasks set in the controlled assessments for unit B065.

   http://www.freepascal.org/

- Greenfoot: Environment for introducing object oriented programming. Greenfoot is an excellent introduction to JAVA programming. The tasks in unit B065 may be solved within the JAVA environment and greenfoot is a good starting point for those students who wish to take their programming a little further and work with JAVA.

  http://www.greenfoot.org/index.html

- Proganimate: An interactive flowchart based visual problem solving tool and code generator. It is aimed at the basics of programming, problem solving and code reading skills. It can generate code in various languages including VB.net, VB 6, Pascal and Java. It is a good starting point for problem solving skills and suited to development work for unit B065.

  http://www.comp.glam.ac.uk/pages/staff/asscott/progranimate/

- Raptor: Visual algorithm based application that allows students to create flowcharts that they can run and test. It is a good starting point for logical processing within the work for unit B065.

  http://www.usafa.af.mil/df/dfcs/bios/mcc_html/raptor.cfm

- RoboMind: Programmable robot environment designed to introduce programming concepts in an easy and enjoyable way. This is a particularly good way to introduce programming concepts for both B065 and the B064 game option.

  http://www.robomind.net/en/index.html

- Scratch Great resource from MIT for introducing programming that uses colour coded snap together blocks to create sequences of instructions. A good starting point for developing the logical programming processes not hindered by the syntax barrier

  http://scratch.mit.edu/

For further resources to support teaching.

http://info.scratch.mit.edu/Educators

- Zigzag publishing produce materials to support students who are learning to programme for various programming languages..

  http://zigzageducation.co.uk/

- Small Basic: A simple 3rd generation BASIC

  http://msdn.microsoft.com/en-us/devlabs/cc950524.aspx

- Visual Basic.net: Standard free visual .net environment programming language and support.

  http://www.microsoft.com/express/Windows/

- Visual Basic Express / 5/6 for kids by Kidware is a useful step by step course showing students how to develop a range of interesting VB program in either VB express of VB 5 or 6. These tutorials are an ideal starting point for work on unit B065.

  http://www.kidwaresoftware.com/

- Visual Basic Express books all suited for learning the programming skills required for unit B065 and for going on to A level computing.

- Visual Basic Express in easy steps by Mike McGrath is an excellent easy to follow introduction to the language.

- Visual Basic Express for absolute beginners by Jerry Ford is a more detailed book for those who want to go beyond the absolute basics of the language.

- Visual basic for A level computing by Bob Reeves and David Fogg also contains useful examples of how to develop VB programs that will be of use to students taking this optional unit,

Websites for general background information especially useful for unit B063

- http://www.statistics.gov.uk/census2001/census2001.asp

  (National statistics gives a wide variety of data presenting in a variety of formats)

- http://www.coventry.gov.uk/ccm/content/city-development-directorate/coventrystatistics/ward-profiles.en

  (Example of a Local Authority presenting information about the census by Ward – can use their own area)

- http://www.publications.parliament.uk/pa/cm200809/cmselect/cmjust/186/186.pdf

  (Formal report by a parliamentary sub-committee)

- http://www.number10.gov.uk/tour/

- http://www.ford.co.uk/Cars/NewKa

6   Open source software in schools

6.1   Introduction

Free, Open Source Software (FOSS) works on Windows, Mac and Linux computers. Actually FOSS also runs on computers that have operating systems in addition to the 'big three' above and includes Sun's Solaris, BSD and Unix.

In this guide the software selected is 'cross platform', that is there are versions for Windows, Linux and Mac.

FOSS licences require the programming code known as the 'source code' to be supplied with the 'compiled' software that will actually run on your computer. The availability of the source code means that others who come after the original authors can modify and improve the code if they so wish. The same licence also allows them to freely copy and distribute the final software to others but equally and importantly, it prevents them from 'closing' (hiding) the modified code.

The idea is that I, as the user, have benefited from the considerable work of others for free. You are free to exploit this commercially and improve on it but any change you make should be fed back into the community that maintains the software. This way all benefit. It sounds idealistic and it is but as a development model it has been very successful indeed. Ask Google, FireFox, Wikipedia and Facebook to name but four of many beneficiaries.

Closed code software, commonly known as proprietary software, on the other hand may be free of charge and is often called 'freeware' (or conversely it may be very expensive), but in all cases the source code from which the final software is built is not made available when the software is purchased.

The simplest way to get FOSS is to download it from the Internet. The only drawback is that a broadband connection is really required to make this a realistic thing to do. However on the supplier's web sites you will often see that a CD is available which can be mailed to you for a nominal cost to cover the production and postage costs.

This guide is a necessarily incomplete collection of some of the best FOSS for use in schools. Incomplete, because FOSS can change and evolve very rapidly, the list will increased before I have finished.

For each of the applications listed below, the relevant sections in OCR GCSE ICT J461 and J061 have been highlighted and where applicable a comment added.

6.2   Desktop Based Applications

The top ten below are the 'regular guys and gals' of the software world.

All function off-line and if any software categories can be considered traditional or mainstream, these are they.

2.1.1 Software and Operating Systems applies to all below.

1) Operating Systems: Linux

Linux is an operating system rather than an application, in the way that Microsoft Windows Vista is an operating system (OS) and MS Word is an application.

Linux OS however is included in the list as number one for several reasons.

Linux installs on the same computer hardware as does Windows and later Mac operating systems.

The difference is that Linux is free; free of cost, free of viruses, free to distribute to others. It is also easy to use but what what will seem strange to Windows and Mac user is that there are not one but many Linuxes. Different Linuxes suit different situations.

I will recommend two personal favorites: Ubuntu 9.10 and Puppy Linux 4. These are polar opposites. The former rivals Windows 7 or Mac OsX in sophistication and features, the latter is incredibly fast running on the most modest and elderly of computers.

There are many others, all free, all worth a try.

2) Internet Access: Google Chrome and Mozilla Firefox web browsers.

Both browsers are available as free downloads for Windows, Mac and Linux computers.

Google Chrome is based compiled from the fully open source Chromium repository and is a very fast lightweight no frills tabbed browser. Designed with the Chrome operating system in mind Chrome has excellent integration with online applications. What this means in practice is that a favourite application that a student may use on the web can be represented on the user's desktop just like any other application.

Click to launch and it appears 'application-like' on the desktop without the other clutter associated with browsers such as address bars and search tools.

Firefox is a well known and fully featured web browser. It is very secure and supports a wide range of extensions and plugins.

3) Office Suite: Open Office 3.2.x (2.1.1, 2.1.3, 2.1.4, 2.4.1)

Available for computers running Windows, Linux or Mac OSx operating systems.

Free to download, fully Open Source. Part funded by Oracle/Sun Micro systems: Uses Sun Java J2RE

OO3.2 is the premier open source Office suite. It offers a full replacement for Microsoft's Office suite. OO3.2 consists of a word processor (Write) a spreadsheet (Calc), a presentation package (Impress) and a database (Base) which are direct replacements for MS Word, Excel, PowerPoint and Access. File compatibility with MS Office equivalent programs is very good.

OO3.2 is similar in layout to the equivalent 2003 Microsoft versions and so avoids the novelty of the MS 2007/2010 Office suite whilst maintaining file compatibility with their new .docx, xlsx and .pptx formats.

Uniquely OO3.2 has the facility to export all documents as .pdf format.

OO3.2 can be recommended as a complete replacement for MS Office with the caveat that embedded videos in Impress are less easy to handle than in PowerPoint. Base is very similar to MS Access but has the advantage of being a fully SQL database (require J2EE).

Comments: Open Office is a direct replacement for all of the uses of MS Office. It has the advantage that it keeps a look and feel similar to MS Office 2003 and has lower system requirements than MS Office 2007/2010.

4) Word Processing and Spreadsheet: Abiword and Gnumeric (2.1.1, 2.13, 2.1.4)

Both are available as free downloads for Windows and Linux computers.
Abiword is a word processing program that has fewer features than Open Office but is excellent for school use and has very good file compatibility with MS Word (but wont open .docx). It is easy to use and very fast. It will run quickly on older computers.

Gnumeric is a spreadsheet application. Once again it runs very quickly on older computers or smaller computers such as netbooks. Again it has fewer features than MS Excel or Open Office Calc but is excellent for use in schools for that very reason.

Comments: Gnumeric and Abiword are competent spreadsheet and word-processing applications which students find easier to navigate as the interfaces are simpler than Open Ofice or MS Office.

Gnumeric has fewer graphing options than its bigger counterparts.

5) Vector Drawing: Inkscape (2.1.1, 2.1.3, 2.4)

Inkscape is a vector drawing program similar to (now unavailable) Corel Draw.

It is available for Windows, Linux and Mac operating systems (requires X Windows) as a free download.

Inkscape is easy to use and very powerful allowing complex artistic drawing tools to be manipulated easily. Finished drawings can be saved as a vector projects or exported as bitmaps (.bmp) for easy insertion into other programs.

Use Inkscape in design related subjects such as art and design, textiles and design technology.

Inkscape is not a CAD package but has good precision tools for technical drawing projects especially when combined with a drawing tablet.

Comments: Inkscape is a very creative tool easily accessed by less able students but has the capability of sophisticated use especially generating graphics for DTP or Presentation work in 2,13

6) Image Processing: The Gimp (2.1.1, 2.1.3, 2.4)

The Gimp is available for Windows Mac and Linux computers as a free download.

Although it has a strange name, The Gimp is a fully featured graphics manipulation program.

It has much the same functionality and features as Adobe Photoshop. It is easy to install and use and provides the ability to handle all file formats.

It has good integration with scanning software and good control over printing output. Combine with Inkscape above and the two provide comprehensive free, cross platform graphics software.

Comments: The Gimp, like Adobe Photoshop requires introductory tuition. The latest is as easy to use as any high end graphics package and is very useful for 2.13 and 2.14.

7) Desktop Publishing: Scribus (2.13)

Available for free download for Windows, Linux, Mac OSX.

Scribus is a modern easy to use 'press ready' desktop publication application similar in its frame based layout to the old professional standard application Quark.

It supports all of the features required for publication including excellent input file support, CMYK separations, Spot Colours and PDF creation.

8) Music Editing: Audacity (2.1.1,2.4)

Available for free download for Windows, Mac and Linux computers.

Audacity is a leading and extremely popular and versatile music editing suite. It is very easy to use, handles multiple tracks and a large range of file formats. Projects can be imported and exported in a range of popular formats including .ogg, .mp3, .wav.

Audacity is ideal for preparing files for broadcast or podcasting as well as mixing tracks for music production and movie sound tracks.

Comments: very popular and easy to use creative app (2.4) but also a very good introduction to the amazing variety of file formats and CODECS in use.

9) Movie Player (Mplayer) (2.1.1, 2.1.6)

MPlayer is available as a free download for Windows, Mac and Linux computers.

MPlayer is simply the most versatile movie player for PC. Its real strength is its ability to play back a huge range of movie formats including MPEG2, MPEG4, MOV, AVI, WMV3.

It also supports BlueRay and HD DVD.

MPlayer means that if you want to be sure that a movie file is 'compatible' with your computer you can rely on MPlayer

Comments: An excellent utility and very useful for teaching video file formats and all things to do with digital rights management (2.1.6)

10) Cinelarra (2.4)

Cinelarra is available as a free download for Linux only.

It is included in this list because it provides high end non-linear video editing capabilities suitable for multi-media work and since it requires considerable hardware resources from a computer it would in any case need a dedicated workstation to use it. So in this case the workstation would use a Linux operating system.
Comments: Free, perfect for multimedia authoring, steep learning curve, very powerful

6.3   Web Based Open Source Software (2.1.2)

The web applications below all focus on the emerging technologies and have at their core data exchange and collaboration

The second section deals with the newer developments in ICT provision. Categorisation is slightly more difficult. In general they are web-based, collaborative and business oriented.

Web 2.0: Mashups

Mashups are ad hoc mixtures of web-based applications with desktop applications and data sources. For example a student may want to 'integrate 'Flickr with Amazon with their Blog. Mashup software provides a tool set to do this kind of thing very easily.

The leading FOSS software would be:

Apatar and ProcessMaker.

Both have a business application orientation and would be useful tools for a work experience or business studies package, especially combined with desktop tools such as the cross platform free to download MIndMaps

Communications:IM

Pidgin is a free FOSS download for Windows, Mac and Linux computers

Pidgin is included in this list because it is the universal connection client and is able to chat with MSN, Google Talk, Yahoo and AIM networks all at once.

Communications: IM + Images = Jing

Jing is available for free download for Windows Linux and Mac OSX computers. Jing is freeware so is not open source software. It is included because it is a lot of fun.

Jing is a very easy to use screen capture software which also works for short videos that allows you to share images and movies with your online chat.

Communications: Social Networking and Student Profiles: Mahara

Mahara is an open source web based application which can be accessed as a remote service or as a free download which can be hosted on your own web server.

It is a popular social networking tool in schools and colleges and allows students to create complex personal profiles incorporating multiple file types (pictures, movies etc). It integrates very well with the Moodle VLE.

Communications: Podcasting receiver: Juice

Juice is free to download software for Windows, Mac and Linux.

Jiuce is easy to use and allows you to capture and listen to podcasts.

Communications: Podcasting generation: Podcast Generator

Podcast Generator is a free web based script which allows you to generate and publish podcasts. Very easy to use and supports any media type.

Cloud: Jolicloud

Jolicloud is a web operating system which is accessed optimally through the Chrome browser (though Firefox will work fine) . It provides a seamless connection with 600 web based applications.
Jolicloud is currently optimised for netbooks which have small screens and are unable to store many large applications. It provides a desktop like application experience when using applications hosted on the web.

Cloud: Pogoplug

Popgoplug is sub £100 hardware which has FOSS software embedded into it.

It plugs into a spare Ethernet port on a router which has a connection to the Internet.

Pogoplug allows students to setup and explore the creation of their own web based applications and file sharing facilities wherever they are in the world.

Anti-Virus

Clam-AV (2.1.1, 2.1.5)

Clam-AV is free to download anti-virus software that works on Windows, Unix and Linux operating systems.

It scans and removes viruses on Windows computers and other computers that contain files that carry Windows viruses

Comment: Although viruses are prevalent only on Windows computers it has been demonstrated that they can infiltrate other operating systems. Clam-AV's heuristics make it a good teaching tool for identifying viruses and other malicious software by category.

Programming

Gambas (2.5.1)

Gambas is a cross-paltform free download programming language.

GAMBAS (Gambas Almost Like BASIC) is very like MS Visual Basic but very suitable for almost any computer or operating system. It is the ideal place to start young programmers without confining them to one operating system.

Comment: There are many cross platform open source programming environments (Java, Python) but GAMBAS seems to be the easiest introduction for young people.

7 Other forms of Support

In order to help you implement the new GCSE ICT Specification effectively, OCR offers a comprehensive package of support. This includes:

- GCSE ICT Specification

- Specimen assessment materials for each unit, including sample computer-based tests

- Guide to Controlled Assessment

- Sample Schemes of Work and Lesson Plans for each unit.

Published Resources

OCR offers centres a wealth of quality published support with a fantastic choice of 'Official Publisher Partner' and 'Approved Publication' resources, all endorsed by OCR for use with OCR specifications.

Publisher partners

OCR works in close collaboration with three Publisher Partners; Hodder Education, Heinemann and Oxford University Press (OUP) to ensure centres have access to:

- Better published support, available when you need it, tailored to OCR specifications

- Quality resources produced in consultation with OCR subject teams, which are linked to OCR's teacher support materials

- More resources for specifications with lower candidate entries

- Materials that are subject to a thorough quality assurance process to achieve endorsement

Hodder is the publisher partner for OCR GCSE ICT.
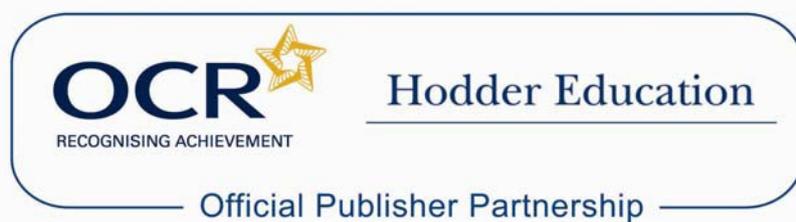
Hodder is producing the following resources for OCR GCSE ICT for first teaching in September 2010, which will be available in Summer 2010.

Steve Cushing,Brian Gillinder, George Rouse. OCR Information and Communication Technology GCSE Student Book (2010) ISBN: 9781444108644

Approved publications

OCR endorses other publisher materials, which undergo a thorough quality assurance process to achieve endorsement.   By offering a choice of endorsed materials, centres can be assured of quality support for all OCR qualifications.

Endorsement

OCR endorses a range of publisher materials to provide quality support for centres delivering its qualifications. You can be confident that materials branded with OCR's "Official Publishing Partner" or "Approved publication" logos have undergone a thorough quality assurance process to achieve endorsement. All responsibility for the content of the publisher's materials rests with the publisher.

These endorsements do not mean that the materials are the only suitable resources available or necessary to achieve an OCR qualification. Any resource lists which are produced by OCR shall include a range of appropriate texts.

Professional Development

The 2012-13 OCR Professional Development Programme offers more accessible and more cost effective training, with the same valued content that you expect from us.

At OCR, we are constantly looking for ways in which we can improve the support we offer to teachers. Most recently we have been considering the increasing challenges that schools face in releasing teachers for INSET, and how OCR can make its professional development programme more accessible and convenient for all.

From September 2012, our new improved programme will include:

- FREE online professional development units available when and where you want them
- FREE live web broadcasts of professional development events
- FREE face to face training for GCSE controlled assessment and GCE coursework
- A series of 'not to be missed' premier professional development events.

For more information, please email training@ocr.org.uk or visit www.ocr.org.uk/training.

OCR Social

Visit our social media site (http://www.social.ocr.org.uk). By registering you will have free access to a dedicated platform where teachers can engage with each other - and OCR - to share best practice, offer guidance and access a range of support materials produced by other teachers; such as lesson plans, presentations, videos and links to other helpful sites.

Interchange

OCR Interchange has been developed to help you to carry out day to day administration functions online, quickly and easily. The site allows you to register and enter candidates online. In addition, you can gain immediate and free access to candidate information at your convenience. Sign up at https://interchange.ocr.org.uk

8   Frequently Asked Questions

General

Is there a short course?

Yes, units B061 and B062 make up a short course in GCSE ICT. At present, centres in England will need to explore funding options.

Why are there optional units?

We wanted to give schools that wished to offer their students a computing pathway but who could not resource the full computing GCSE the possibility to achieve this. The option allows students to focus upon ICT for the first three units but then focus upon coding a solution for their final unit. This helps prepare them for computing A level and offers more flexibility to centres.

Will there also be traditional database and spreadsheet controlled assessments?

Yes, the intention is to provide a full range of tasks that suit all learner and teacher interests.

How long will a controlled assessment last, are they just for one year?

We fully understand the difficulty teachers have in providing resources for controlled assessment. As such, each controlled assessment lasts for a number of years and you will be given plenty of warning when one is to be removed.

Is there a natural progression from existing courses?

Yes, the units have all been developed with you the teacher in mind, building upon what you have told us are the best features of OCR's ICT courses.

Why is unit B063 based upon a research brief?

This allows us to set a context for the examination paper. By doing this, learners can engage an innovative method of learning that fits neatly with the assessment.

How is the focus of the controlled task more practical? Do candidates still follow a design process?

The focus of the controlled assessment tasks is outcome based but we need to reward quality outcomes. A quality outcome must meet the needs of the user so, yes there are elements of design that must be followed although the term design process suggests a static model where one step always follows the next in a set order. Candidates do have to design a quality solution but not in a set order.

How does the mark scheme allow for this?

We have used a banded, best-fit mark scheme. This allows for more flexibility and allows the focus to move towards rewarding a quality outcome. There are no set hurdles that have to be in a candidate work irrespective of their appropriateness. The mark schemes in all units are set and will, therefore, not change from examination series to examination series.

How is a candidate's grade calculated?

The maximum raw mark for each unit is 60 marks. The candidate's raw mark for each unit is converted to a uniform mark scale, known as UMS. The weighting of units may vary so UMS unifies the marks to make them compatible and comparable. UMS gives a fixed scale with common boundaries that are unchanged year-on-year. Candidates are awarded a grade for each unit. The grade of the overall qualification is calculated by combining the uniform marks achieved in the individual units. This gives candidates a final uniform mark which is compared against the overall UMS grade boundaries to calculate the qualification grade. For more information on GCSE ICT grading see Section 3.4 of the specification.

Unit B061: ICT in today's world

What format will the questions take?

Some will be multiple choices, some short answer and some requiring longer prose style answers

Will I have to enter a specific tier for each student?

There is a single tier entry for each paper; this will remove the onus on the teacher of having to make the correct entry choice for each student.

Will all the areas of the specification be covered at each session?

Wherever possible the widest coverage of the specification will be done, however it is impossible to cover all areas in one sitting. Over a period of three years all areas should be covered.

Do the units have to be taken in a specific order?

No.

Do all the pupils at my centre have to be entered for the computer-based test or may I enter some for the on-line and some for the written paper?

Page 38 in the specification outlines the necessity for candidates from one centre for each unit to be entered either via the computer-based test or the paper test.

Unit B062: Practical applications in ICT

Is this a compulsory unit?

This unit is compulsory for a GCSE in Information and Communication Technology

What is this unit worth?

For the full GCSE this unit is worth 30% of the GCSE in Information and Communication Technology

For the short course GCSE this unit is worth 60% of the GCSE in Information and Communication Technology

What is the entry code for this unit?

The entry code for this unit is B062.

How is this unit assessed?

This unit is assessed by a controlled assessment which is set by OCR. It is internally assessed and externally moderated.

Candidates are required to create an ICT solution using ICT applications. Candidates will choose **one** task from a list provided by OCR.

Approximately 20 hours will be required for the assessment. Up to 8 hours will be required for research/preparation and up to 12 hours in producing the final outcome.

When is this unit available for assessment?

This unit is available from June 2014.

Will there be a visiting moderator for this unit?

No. This is an internally assessed and externally moderated unit. Work is submitted either via the postal or OCR Repository options.

Will candidates be able to re-enter units?

Yes. Controlled assessment units can be carried forward with the moderator mark from one session to the next i.e. June 2014 to June 2015. There is a separate 'carry over' code to re-enter the unit.

Is there a text book for this unit?

OCR Information and Communication Technology GCSE Student Book, Steve Cushing, Brian Gillinder and George Rouse, Hodder Education, ISBN: 987-1-85008-545-4

Essential GCSE ICT for OCR, Stephen Doyle, Folens Publishing, ISBN: 978-1-85008-545-4

How can the candidates' work under controlled conditions when they are carrying out research groups?

The research phase, which is approximately 8 hours, is carried out at a low level of control and does not need to be in the classroom or under teacher supervision. Candidates can interview people and discuss their findings with other members of the group.

Do the candidates have to use more than one software application to gain the higher marks?

No. A candidate could use one software application at a high level, intergrating data into different output formats. They may also use two or more software applications if they think it appropriate.

Does the candidate's work have to contain lots of screen shots to show each stage of the development?

No. This would be one way for the candidates to show their understanding of the software tools they have used, but they could present screen shots of the completed solution with annotation explaining the software tools used.

Do we need to have 12 continuous hours of controlled assessment or can we break the controlled assessment up into 'chunks'?

The controlled assessment does not have to be done in one continuous go. Short chunks interspersed with lessons to teach and revise skills, such as how to carry out and present test results, could be devised.

When marking the controlled assessment, does a candidate have to have completed every point in a mark band for me to award a mark at that level?

No. The 'best-fit' approach is to be used for marking controlled assessment. If a candidate has met most of the points in a band and their work fits that band the best, then award a mark from that band even if something is missing. How much and how well the work has been completed will determine the actual mark awarded.

Do I need to award a mark for the candidates' use of spelling and grammar?

The quality of the written communication is assessed in the Evaluation section only.

What software will candidates be tested on during the controlled assessment for this unit?

Candidates are not tested on particular software but use everyday software applications to be able to manipulate and process data and other information effectively and to present information in a format suitable for purpose and audience in order to respond to the chosen OCR set task.

Where can I obtain further details about this unit?

Further details of the learning required for the B062 Practical Applications in ICT are contained in the specification. Specimen Controlled Assessment tasks, Schemes of Work, Lesson Plans, Candidate Style Answers are available on the OCR website.

Unit B063: ICT in context

ICT In context is an examined unit. How often can candidates sit this exam?

There is one examination series each year from June 2014.

I notice that candidates can sit a computer-based test for B063 how does that work?

Candidates should be entered in the normal way by the examinations officer; however, the code B063A/01 will be used to indicate the test will be done electronically. It is up to centres to ensure that the integrity of the exams process is maintained in accordance with JCQ guidelines.

There seems to be a lot of content for B063. How many hours should be spent in preparing candidates for the exam?

The suggested Guided Learning Hours for GCSE ICT is between 120-140, B063 is a unit taught only on the GCSE ICT Full Course and not the Short Course. 20% of the total mark is allocated to B063, therefore based on 120 GLH a minimum of 24 hours should be allocated. As there are 10 sections to B063 (2.3.1 – 2.3.10) that is approximately 2 ½ hours per section. However, this will vary greatly between centres as they develop schemes of work appropriate to their candidates.

As ICT in context is based on a pre-release task can candidates bring their research into the exam?

No. The pre-release research task prepares candidates to answer questions on the exam paper, therefore, they will not be allowed to take this research in with them when sitting the exam.

If B063 questions are based on pre-release do centres need to cover all the content in the specification for this unit?

It is strongly advised that centres cover all the content for B063 as laid out in the specification to give breadth of understanding. However, it may be that centres wish to spend more time on certain sections in light of the pre-release research tasks.

One section of ICT in context mentions current and emerging technologies. How can this be delivered?

This is an exciting new GCSE ICT specification which encourages candidates to look at the impact current and new technologies has had on them and businesses. Some of the content for this will be geared around the pre-release scenario but there are a wide variety of examples available. These could be as diverse as exploring how renewable energy sources are used or how nuclear energy is harnessed and supplied, to greater surveillance and security measures

Unit B064: Creative use of ICT

Do you have to use a particular type of software to create computer games?

No. However, the two most popular options are both freeware. Skratch can be downloaded from http://scratch.mit.edu/ and GameMaker7 can be downloaded from http://www.yoyogames.com/ .

Are there any books?

Yes. The author of GameMaker published a book called The GameMaker Apprentice. The companion disc in the book also has GameMaker and a number of sample games.

Can you create games using other software?

Yes. It is possible to create games with Macromedia Flash and other more formal software like Visual Basic, although the latter would not be the easiest of options.

Do you have to do lots of print screens to show how the game was made?

No. Most of the components of the game would have been documented in the specification and design. A printscreen of the assets of the game with annotations would be sufficient. Further evidence would also come from the testing. If students' work is submitted via the repository, it would be very easy for the moderator to see the source file of the game and therefore confirm the marks awarded.

Do you have to make mistakes on the design on purpose so that students can add improvements to get better marks?

No. The specification has been redesign to award higher marks to competent solutions including their justification in terms of purpose and audience.

Do students have to do every point in a band to score in that mark band?

No. Students are awarded marks from a particular mark band on the best fit principle. Once, the correct mark band has been established for a piece of work, it is the quality of the work and the number of points covered that will decide what marks should be awarded.

Can students do coursework at home?

No. Students' work must be completed under controlled conditions, therefore, it must be completed in school. Coursework has now been replaced by Controlled Assessment.

How many hours do students have to complete their assessment?

The specification provides a suggestion of the suitable number of hours recommended to complete the assessment. This is not mandatory and therefore should be used as a guideline.
The mark scheme mentions collaborative work. What does that mean?

Collaborative work means that students need to involve others in their assessment. This can be done through requests for feedback in the design or testing sections of the assessment.

Is the OCR Repository compulsory for this unit?

No. It would be certainly beneficial to submit this unit via the repository but it is not essential as postal submission is also available. However, it is important to remember that students' work can only be submitted either postal or repository, it is not possible to pick and mix.

Will there be a visiting moderator for this unit?

No, it is an internally assessed and externally moderated unit. Work is submitted either postal or repository.

Our network has very high restrictions of internet games or any games. How do students get to review games for their research?

Internet or PC games are not the only game platforms that students can use. Games on mobile phones, playstations like PS2 or PS3, Xbox or gamecube, the Wii or the DS. It is also possible for students to look/play games at home and write the review of the games in school under controlled assessment conditions.

In the evaluation, do they have to pretend they are the customer for the game?

Not really. The main focus of this unit is producing a high quality product that provides the best solution for the scenario. In the initial part of the assignment, students are required to set measurable success criteria for their product in line with audience and purpose. Evaluation uses testing feedback and the initial success criteria to evaluate the solution and its merits and perhaps weaknesses.

Are the scenarios provided the only ones?

Each year new scenarios will be added to the list of scenarios already available. There will be plenty of notice if a scenario is to be taken off the list.

What resources will OCR provide to support this unit?

Hodder has published a number of resources covering each of the scenarios available. As new scenarios become available, further support for that particular scenario will be published. Also, OCR will be providing lesson plans and a number of tutorials/resources to support delivery.

Unit B065: Coding a solution

What programming languages do we require to take this course?

There is no specific programming language specified for this unit and those freely available for free download are acceptable Visual Basic Express has all the features you will require, and, depending upon the solution identified by the student Small Basic may be a suitable solution. If your candidates choose to program in any of the other commonly available languages we are confident we can find a moderator to assess your marking of the controlled assessment If you decide to use something unusual it would be wise to let us know in advance, in case we need to re direct your work to a specific moderator.

Can we use applications such as Excel or Access instead to create a solution?

No it is a coding task and the primary purpose is to produce a coded solution to a problem If data handling forms part of the controlled assessment it may be acceptable to include database or spreadsheet modules into the coded solution, but these must be the add-ins, not the primary element in the solution.

Can we modify the controlled assessment to make it more appropriate to our candidates?

You may make some modifications to the scenario to make it more appropriate to your students but these changes should not modify the nature of the underlying programming task, these are set to provide opportunities to use the main programming features identified in the specification available If these are modified candidates may not be able to access all of the marks.

Does this mean candidates have to use ALL of the programming features in the specification in order to access full marks?

No. The full marks will be available to candidates who use the most appropriate features effectively and efficiently. Which features they use will depend upon their solution to the problem and there will be features that are not required for their solution. The tasks are set to ensure most of the features will be required, but a student may not need to use, for example both a CASE statement and an IF THEN. In some languages the CASE statement does not exist so cannot be used.

What do you mean by effective and efficient?

There are different levels at which a solution may be produced. A solution that provides a form of solution a may be very badly coded with many loose ends, extra modules that serve no purpose, circuitous routes to a solution, in short a clumsy but largely functional solution. An effective solution will function as required and be coded using the right techniques, though not efficiently, for example lots of IF THEN statements when a CASE or IF THEN ELSEIF structure would produce a tidier and more efficient solution The efficient solution will be well structured and well coded with few extra elements, clear pathways through the code with the most appropriate techniques used throughout.

Does the work have to be printed out with all the evidence?

No. The work can be submitted electronically through the coursework repository but you must not rely on the moderator having any specific software on their computer to be able to view the work You may assume they can read a standard .doc file or view a .avi file etc but you may not assume they have a copy of any specific programming language or application to view the work Students may keep diaries in web logs but please make sure the links are included and that the moderator can access these web logs without recourse to passwords or signing up to specific sites, they will not do this.

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