GCSE Information and Communication Technology

Introduction

This outline scheme of work breaks the AQA GCSE Specification A into week-by-week topics. It is intended for use with the GCSE materials supplied by McWeeney Publications and it assumes the availability of all three components of the CD "The Complete GCSE Course for GCSE" written by Steve McWeeney, which is available from the publisher.

It is hoped that the document will be useful to those centres using these materials and provide a resource that can be edited to match their individual needs.

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Course Model

During the half of year 10 students will work at developing skills in the use and knowledge of database, spreadsheet, word-processor and desk-top

publishing packages building on the skills developed in year 9. Students will work through the *GCSE Practical Course* booklet thus developing the analysis and design skills required for the board-set assignment.

In the second half of year 10, students will complete the board set assignment which will count 30% towards their final grade.

On average two thirds of lessons will be devoted to practical in year 10. The remaining third will be used to deliver the theory. Homeworks, taken from the homework booklet will act as a trigger for the theory lessons.

Towards the end of year 10 students will begin preparatory planning for their project.

In year 11 students will spend the first half term completing or improving their board set assignment.

Resources

McWeeney Publications Theory Book, Student Work Book and Practical Course (The Complete ICT Course for GCSE). Grid of practical tasks to monitor student progress. Tests comprising questions selected from previous examination papers. Revision Booklet. Past Papers. Computers with Microsoft Office suite and Photo Editor installed, Colour printer (note that Photo Editor is, from Office 2003 onwards, not included with the office software. Either an earlier version can be used, assuming you have the appropriate licence, or an alternative photo editing program will be required.). Students will need individual access to a computer.

Assessment

Candidates may be entered for either the foundation tier (Grades C - G) or the higher tier (Grades A* - D)

Course work (60%) assessed in accordance with the examination regulations by the member of staff who has taught the pupil. (Co-ordination and moderation organised via head of IT department).

The course work assessment is based on the student's completion of the board set assignment which is marked in accordance with the accompanying confidential instructions (30%) and a project which is marked in accordance with the guidance provided in the syllabus (30%).

Terminal Examination - one paper of 1½ hours counting 40%. Different papers are set for each tier.

Practical Course

This will take up between 60% and 80% of lesson time and will include some analysis and design work to be done at home.

Theory Course

Approximately 33% of lesson time in year 10. The general pattern will be that students will be asked, for homework, to read a chapter or section from the theory book and complete questions from the end of that chapter. These will be answered in a homework exercise book. The marked homework will be returned the following lesson. The homework will be gone over with the group and used as a starting point for a theory lesson. Theory lessons will be

a mixture of explanation and consolidation of knowledge using the Student Workbook. They will answer questions from the workbook and then mark their own work during a discussion session in the theory lesson.

Students will be given four formal tests during year 10. These will test both the theory and the practical content.

Detailed Teaching Plan for Year 10

The following scheme of work shows the theory and practical content that should be covered each week. It also gives a suggested homework, which is taken from the Theory Book. In some cases the suggested homework covers a topic that will be taught in the following week so that the homework acts as a trigger for the following theory lesson.

The workbook section in the Teaching Plan cross references the theory topic being taught to related sections of the Student Workbook. These may be used in the lesson to reinforce and consolidate understanding within the lesson. Where there is insufficient time to complete these during a lesson they could also be used as homework.

The practical work indicates the minimum practical work that should be covered each week, following the GCSE Practical Course booklet. Students will be working at their own pace so many will be able to achieve a faster rate of progress through the practical.

NB This scheme of work has been revised to match the new edition of the theory and practical materials (September 2005). The revised theory book contains an additional two chapters. This means that this scheme of work will not match with earlier editions of the theory book. If you have an earlier edition of the GCSE materials, then you can upgrade to the latest version for £15. See www.mcweeney.co.uk for details.

	Theory Work	Practical Work
10/1	**9.1 The general structure of information systems**	
Content	Difference between information and data Data as raw values. Information has context. Data flow - Input, Process and Output System Flowchart Workbook: *Information and Data (page 1)*	Stages of solution – Analysis, Design, Implementation, Testing and Evaluation.
Homework	Questions 1	Questions
10/2	**9.1 The general structure of information systems**	
Content	System Flowchart Workbook: *Using Computers (page 2)*	Performance Criteria. Begin Disco Ticket Analysis Read Disco Ticket Design Begin Implementation
Homework	Read Chapter 2.Questions 2.1 – 2.4	Complete Disco Ticket Analysis
10/3	**9.2 Hardware Components**	
Content	What is an input device. Capabilities and applications of Keyboard, Mouse, Touch Pad, Tracker Ball, Joystick Workbook: *Input Devices/Choosing the Right Input Device (page 3)*	Disco Ticket Implementation
Homework	Questions 2.5 – 2.9 Read Chapter 6 Mail Merge (p49). Question 6.4	
10/4	**9.2 Hardware Components**	
Content	Capabilities and applications of Digital Camera, Scanner, Microphone, Touch Sensitive Screen, Light Pen, Digitiser. Workbook: *Name the Input Device/A Typical Home Computer (page 3)*	Disco Ticket Implementation Disco Ticket Evaluation
Homework	Read chapter 3. Questions 3	Complete Disco Ticket Evaluation

10/5	**9.2 Hardware Components**		
Content	What is an output device. Capabilities and applications of VDU, Printers (Dot Matrix, Ink Jet and laser), Plotters, Speakers		Classroom Display Analysis and Design Classroom Display Implementation
	Workbook	*Output Devices/Choosing the Right Output Device/Name the Output Device/A Typical Home Computer (page4)*	
Homework	Revise for test. Complete unfinished worksheets		Complete Display Analysis/Design
10/6	TEST 1		
Content			Classroom Display implementation
Homework	Read Chapter 6 DTP Features. Question 6.3		
10/7			
Content	Go over test		Classroom Display Completed
Homework	Read Chapter 4. Questions 4.1 to 4.3		Complete Display Evaluation
10/8	**92 Hardware Components Storage devices and media.**		
Content	Hard and floppy Disks, Magnetic Tape, CD and DVD formats, Memory - ROM and RAM, Volatile/Non Volatile Nature/speed of access, applications.		Cash Flow Forecast Analysis Cash Flow Forecast Design
	Workbook	*Computer Hardware/Computer System/Media/Memory/Types of Access. (pages 6 & 7)*	
Homework	Questions 4.4 – 4.6		Complete cash flow design
10/9	**9.3 Operating Environment**		
Content	Provides communication between applications software and hardware Manages system resources - memory, allocation of CPU time Manages data transfer including transfers to and from peripherals Manages system security Applications software may be specific to a particular operating system. (Note that knowledge of applications packages should be gained from practical work) Multiuser/Multitasking		Cash Flow implementation and testing
Homework	Read Chapter 5. Questions 5 Read Chapter 6 Spreadsheet Packages (pp 41-44). Questions 6.2		
10/10	**9.6 Applications Software** **9.7 Development of applications software** **9.4 Data Transfer**		
Content	Applications software designed to carry out user related tasks, written in a computer language, can be configured to suit the particular preferences of users, can be customised by altering the coding, code can be written for an application to meet the specific needs of the user File Formats/Data transfer		Complete cash flow implementation and testing
	Workbook	*Software/Booting Up/At the Supermarket (pages 7+8)* *Vocabulary Test 1/Put it Together (pages 9+10)*	
Homework	Read Chapter 7. Questions 7.1 to 7.5		Cash flow evaluation
10/11	**9.11 Storing Data – Data Structures**		

Content	Database as a collection of stored data organised into files/tables Fields and records Nature and purpose of key fields Linking tables to reduce data duplication Data can be extracted from the database to produce many different reports Data from different files can be used to produce a single report Coding Data Fields can be of different type		Letterhead analysis Technique 1 Technique 2
	Workbook	*Databases/Files Records and Fields/Key Field/Which is the Key/ Data Types/Video Library Example (pages 11+12)*	
Homework	Question 7.6 – 7.7		
10/12	**9.11 Storing Data – Implications of File Size** **9.13 Processing data**		
Content	Fields can be of fixed or variable length - advantages and disadvantages of each Files can be large and large files require a large backing store. Data compression can be used but files must be expanded before use Use of AND, OR and NOT in construction of queries and filters		Technique 3
	Workbook	*Selecting Data/Find The Record/Selecting Fields/Using List/Putting it Together/Complete Instructions (pages 13 +14)*	
Homework	Read chapter 8 Question 8.1		
10/13	**9.13 Processing data**		
Content	Use of AND, OR and NOT in construction of queries and filters		Technique 4
	Workbook	*Joining Conditions/Get the Information/Wildcard Searches/Using Wildcards (pages 15 + 16)*	
Homework	Revise for test		Complete Letterhead design
10/14	TEST 2		
Content			Letterhead implementation
Homework	Questions 8.2		
10/15	**9.13 Processing data**		Complete letterhead implementation
Content	Use of AND, OR and NOT in construction of queries and filters		
	Workbook	*Using a Query to Select Records/Complete the Grid (pages 17-19)*	
Homework	Questions 8.3 – 8.5		Letterhead evaluation
10/16	**9.10 Gathering Data Validation**		
Content	Range check, presence check, check digit, data type check parity, check, and the type of errors each will detect and where used.		Members books and CSV files
	Workbook	*Validation/Different Validation Methods/Coding Characters/Validating Data on Input/Range Check/List Check/Check Digit/Incorrect Data (pages 21+22)*	
Homework	Questions 8.6 – 8.8		
10/17	**9.10 Gathering Different Methods**		
Content	Understand the use of questionnaires, data capture forms		Members books and CSV files

	Workbook	*Vocabulary Test 2 (pages 23 + 24)* *Data Capture Form/Warranty Database/Collecting the Data/Choose a Method/Prompts/Design a Form (pages 25-27)*	
Homework	Questions 9.1 – 9.4		
10/18	**9.10 Gathering Different Methods**		
Content	OMR, OCR, MICR		Queries: Try it yourself
	Workbook	*Computer Readable Forms/Characters and Marks/Choosing a Method (Page 28)*	
Homework	Questions 10.1 – 10.5		Mail merge design and test plan
10/19	**9.10 Gathering Different Methods**		
Content	Bar codes, magnetic strip		Mail merge implementation
	Workbook	*Swipe Cards/Getting the Cash/Barcodes/Who Benefits/At the Library/Borrowing a Book (pages 28-31)*	
Homework	Revise for Test		
10/20	TEST 3		
Content			Complete mail merge implementation
Homework	Questions 10.6 – 10.7		Mail merge evaluation
10/21	**9.9 Evaluation of hardware and software**		
Content	Explain why particular hardware and software is appropriate for a particular task. Develop criteria for evaluating hardware and software.		Computer Manufacturer Analysis Computer Manufacturer Design
Homework	Read chapter 11. Questions 11.1 – 11.2		Complete Design
10/22	**9.13 Processing data**		
Content	Order of records depend on which order fields are chosen for sorting. Batch, real time interactive and transaction Understand when each is appropriate Importance of sorting transaction file before merge.		Computer Manufacturer Implementation
Homework	Questions 11. 3 – 11.5		
10/23	**9.13 Processing data**		
Content	Batch, real time interactive and transaction Understand when each is appropriate		Complete Computer Manufacturer Implementation. Testing and Answers
	Workbook	*File Processing/Processing (pages 33 + 34)*	
Homework	Questions 11.6 – 11.8		Computer Manufacturer Evaluation
10/24	**9.12 Security of data**		
Content	Describe both physical and software methods of securing stored data Physical methods to protect from heat, magnetic fields, water The need to restrict access to terminals and buildings		Book Issue Analysis Book Issue Design
	Workbook	*Data Security (Page 35)*	
Homework	Questions 12		Complete Book Issue Design

10/25	**9.12 Security of stored data**	
Content	File generation backup File dumps and transaction log files for backing up on-line systems Passwords to prevent unauthorised access to data Restrict physical access to terminals/buildings Protection from heat/magnetic fields/water Encryption to prevent use of stolen data	Book Issue Implementation and Testing
Homework	Read Chapter 13. Questions 13.1 – 13.5	
10/26	**9.5 User Interface**	
Content	Command Driven, Menu Driven, Graphical Advantages/disadvantages for different categories of user. Design considerations for user interface - consistency, positioning of items on screen, user of colour, and sound, availability of help. Workbook: *Human Machine Interface/Graphic Interface/Processing and Backup (Pages 36+37)*	Book Issue Implementation and testing. Complete book issue work
Homework	Read Chapter 14. Questions 14.1 – 14.5	Book issue evaluation
10/27	**9.7 Networks and Communications**	
Content	Differences between LAN's and WAN's Advantages/disadvantages of networks compared to stand alone systems Modem required for use with telephone lines Comparison of ISDN and modem Electronic mail, advantages and disadvantages compared to fax, telephone and post.	Begin coursework Analysis
Homework	Questions 14.5 – 14.7	
10/28	**9.17 Communications**	
Content	Data can be transmitted rapidly on a global basis Existence of global networks such as the Internet Uses of web pages and search engines Implications of e –commerce (+security) on-line booking services, global information and communication services, integration of digital television, web browsers, mobile phones, digital cameras. Workbook: *The Internet/Using the Internet/LAN/The Doctor's Lan/More Networks (pages 39 + 40)*	Coursework Analysis
Homework	Read chapter 15. Questions 15 1 – 1.3	
10/29	**9.10 Gathering Data – Data logging**	
Content	Range of sensors used to collect data Data collected over long or short periods Logging interval can be long or short Data collected over long or short distances Data collected is stored and can be processed at a later stage	Coursework Analysis
Homework	Questions 15.4 – 15.5	

10/30	**9.2 Hardware Devices – Input** **9.13 Processing Data - Control**	
Content	Capabilities and applications of Motors Switched outputs in control systems Data acquired from sensors can be used to control devices Importance of feedback in control systems Workbook — *Sensors/A Science Experiment/The Met Office/Wallpaper (pages 41-42)*	Coursework
Homework		
10/31	**9.13 Processing Data : Control I**	
Content	Write or interpret simple control programs from a given instruction set. E.g. Logo. Work from chapter 16. Questions 16 in class.	Coursework
Homework	Revise for exam	
10/32	TEST 4	
Content		Coursework
Homework		
10/33	WORK EXPERIENCE	
Content		
Homework		
10/34	WORK EXPERIENCE	
Content		
Homework		
10/35	**9.14 Presenting Information**	
Content	Information can be presented on screen, as hard copy and in multi-media presentations. Select appropriate presentation for a given application Presentations can include sound, text, pictures, graphs and charts.	Coursework
Homework		
10/36		
Content		Coursework
Homework		
10/37		
Content		Coursework
Homework		
10/38	TEST 5	
Content		Coursework
Homework		
10/39		
Content	Go over test	Coursework
Homework		

Detailed Teaching Plan for Year 11

11/1	**9.16 The system life cycle**		
Theory	Steps involved in analysis, design, implementations and testing of a system Nature and purpose of feasibility studies		Coursework – planning for project – Identification of project and initial description of system. Coursework – completing Board Set Assignment
Homework			
11/2	**9.16 The system life cycle**		
Theory	Use of interviews, questionnaires and observation in analysis of existing or new system Principles of top down design/identification of subsystems involved		Coursework – planning for project – Identification of project and initial description of system. Coursework – completing Board Set Assignment
Homework	Read Chapter 17. Questions 17		
11/3	**9.16 The system life cycle**		
Theory	Purpose and nature of evaluation criteria. Be aware that there may be more than one way of implementing a particular system and be able to discus advantages and disadvantages of alternative methods		Coursework – planning for project – Identification of project and initial description of system. Coursework – completing Board Set Assignment
Homework			
11/4	**9.16 The system life cycle**		
Theory	Nature and purpose of testing plan - be aware that testing must include typical, extreme and erroneous data Nature and purpose of documentation which should be provided with a system.		Coursework – planning for project – Identification of project and initial description of system. Coursework – completing Board Set Assignment
	Workbook	*The System Life Cycle/Test Data (page 42)*	
Homework			
11/5	**9.18 Data Protection Act 1998**		
Theory	Data Protection Principles Requirement to register Responsibilities of data controller		Coursework – planning for project – Identification of project and initial description of system. Coursework – completing Board Set Assignment
Homework	Read chapter 18. Questions 18		
11/6	**9.18 Data Protection Act 1998**		
Theory	Rights of data subject		Coursework – planning for project – Identification of project and initial description of system. Coursework – completing Board Set Assignment which should now be finished
	Workbook	*Data Protection Principles/Subject Rights (page43)*	
Homework			
11/7	**9.18 Data Protection Act 1998**		
Theory	Exemptions - full and partial and their effects Understand why electronically stored personal information is potentially easier to misuse than that kept in conventional form. Understand the effects of inaccurate date in files of personal information		Coursework – project design
Homework			

11/8	**9.19 Data Misuse** **9.20 Copyright law and anti-hacking legislation**	
Theory	Computer misuse act 1990 Software cannot be copied without permission Consequences of software piracy Computer hacking - can lead to accidental or deliberate corruption of data Workbook: *Computer Misuse Act 1990/Piracy (page 44)*	Coursework – project design
Homework		
11/9	**9.21 Growth of information and its effects on society**	
Theory	Describe the use of Information technology and compare it with other methods. Understand that personal information may be held on computer, which is of interest to them and their families Consider other applications of IT and its impact on the lives of themselves and others in the community Discuss the environmental, ethical, moral and social issues raised by IT Workbook: *Your Personal Data/Quality of Life/The Downside (pages45 + 46)*	Course Coursework – project design
Homework		
11/10	**9.21 Growth of information and its effects on society**	
Theory	Discuss the environmental, ethical, moral and social issues raised by IT Workbook: *Vocabulary Test 3 (page 47)*	Coursework – project design
Homework		
11/11	**9.22 Health and Safety.**	
Theory	Using a computer for long periods may affect health Steps taken to alleviate stress, eye strain, wrist, back and neck problems. Regulations are in force (EC Directives) to protect workforce from computer related injuries. (Include electrical safety)	Coursework – project design
Homework	Questions 19	
11/12	**9.15 Modelling and Simulation**	
Theory	Computer model based on rules Accuracy of results depends on extent to which the rules are true. Use of spreadsheets for financial modelling Flight simulators and virtual reality software also rely on rules built into the controlling software	Coursework – project implementation
Homework		
11/13		
Theory		Coursework – project implementation
Homework		
11/14	**All lessons until End of March – Coursework Project**	
Theory		Coursework – project implementation
Homework		
11/15		
Theory		Coursework – project implementation
Homework		

11/16		
Theory		Coursework – project implementation
Homework		
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Theory		Coursework – project implementation
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Theory		Coursework – project testint
Homework		
11/21		
Theory		Coursework – project testing
Homework		
11/22		
Theory		Coursework – project testing
Homework		
11/23		
Theory		Coursework – project final writing up. User guide, evaluation and collation of documentation produced during earlier stages.
Homework		
11/24		
Theory		Coursework – project final writing up. User guide, evaluation and collation of documentation produced during earlier stages.
Homework		
11/25		
Theory		Coursework – project final writing up. User guide, evaluation and collation of documentation produced during earlier stages.
Homework		
11/26		
Theory		Coursework – project final writing up. User guide, evaluation and collation of documentation produced during earlier stages.
Homework		
11/27		
Theory		Coursework – project final writing up. User guide, evaluation and collation of documentation produced during earlier stages.
Homework		
11/28		
Theory	Chapter 6- Web design packages. Do question 6.1 and 6.4 as start of revision.	
Homework		
11/29	**Revision – using past papers, Internet sites and revision booklet until exam release starts.**	
Theory		
Homework		
11/30		

Theory		
Homework		
11/31		
Theory		
Homework		
11/32		
Theory		
Homework		

Cross Reference - Teaching Syllabus and Exam Syllabus

9.01 The general structure of information systems	Y10/2, Y10/1
9.02 Hardware Components - Input	Y10/30, Y10/4, Y10/3
9.02 Hardware Components - Output	Y10/5
9.02 Hardware Components Storage devices and media	Y10/8
9.03 Operating Environment	Y10/9
9.04 Data Transfer	Y10/10
9.05 User Interface	Y10/26
9.06 The function of applications software within the system	Y10/10
9.07 Development of applications software	Y10/10
9.08 Networks and Communications	Y10/27
9.09 Evaluation of hardware and software	Y10/21
9.10 Gathering Data – Data logging	Y10/29
9.10 Gathering Data – Different Methods	Y10/19, Y10/18, Y10/17
9.10 Gathering Data - Validation	Y10/16
9.11 Storing Data – Data Structures	Y10/11
9.11 Storing Data – Implications of File Size	Y10/2
9.12 Security of data	Y10/24
9.12 Security of stored data	Y10/25
9.13 Processing Data - Control	Y10/31, Y10/30
9.13 Processing Data – Searching and Matching	Y10/15, Y10/13, Y10/12
9.13 Processing Data Merging	Y10/22
9.13 Processing Data Methods	Y10/23, Y10/22
9.13 Processing Data Sorting	Y10/22
9.14 Presenting Information	Y10/35
9.15 Modelling and Simulation	Y11/12
9.16 The system life cycle	Y11/4, Y11/3, Y11/2, Y11/1
9.17 Communications	Y10/28
9.18 Data Protection Act 1998	Y11/7, Y11/6, Y11/5
9.20 Copyright law and anti-hacking legislation	Y11/8
9.20 Data Misuse	Y11/8
9.21 Growth of information and its effects on society	Y11/10, Y11/9
9.22 Health and Safety	Y11/11