L2 Unit 7: Databases – design and use (2010)

Learning outcomes

By completing this unit candidates will develop a thorough knowledge and understanding of how to create and use a database.

Candidates will be able to:

- design a database to meet the needs of an organisation
- construct a database according to a design
- interrogate a database
- create reports
- create a user interface
- test a database and make recommendations for improvements.

It is anticipated that a candidate will require 40 guided learning hours to complete this unit.

Assessment objectives	Knowledge, understanding and skills
1 Design a database to meet the needs of a business	Design a database and include: • user requirements (purpose and audience) • table structure(s) eg: primary keys, field names, field types, field lengths and any validation methods using facilities such as combo boxes, validation rules, input masks - (or equivalent) • relationships between tables • data entry forms to be used

2 Construct the database according to the design	Construct a database in line with design:
	• table structure
	  ○ primary keys
	  ○ field names
	  ○ field types
	  ○ field lengths
	  ○ field properties
	  ○ validation
	  ○ combo boxes
	  ○ input masks (or equivalent)
	• relationships between linked tables
	• data entry forms
	• import/enter data

Assessment objectives	Knowledge, understanding and skills
3 Interrogate the database	Simple on linked tables, eg: • sort • query using simple criteria Complex on linked tables, eg: • sort on more than one field • query using multiple criteria • query using complex criteria (eg: NOT, BETWEEN, AND, etc) Choice of queries implemented described/explained/justified
4 Create reports	Create reports Reports: • Standard templates • Custom reports • Different formats and purposes eg: o columnar o tabular o labels o grouped with summaries o mail merge eg using address lists o letters/invoices/notices
5 Create a user interface	Implement a user interface to give access to eg: • forms • queries • reports
6 Test the database	Test plan includes the following checks, eg: • database meets original design brief • validation • forms • queries • reports Test database and make necessary changes to improve functionality of database

Assessment

This unit is centre assessed and externally moderated.

In order to achieve this unit, candidates must produce a portfolio of evidence showing that they have met all of the assessment objectives.

Portfolios of work must be produced independently. They will need to be made available, together with witness statements and any other supporting documentation, to the OCR Visiting Moderator when required.

Centres must confirm to OCR that the evidence produced by candidates is authentic. An OCR Centre Authentication Form is provided in the Centre Handbook and includes a declaration for assessors to sign. It is a requirement of the QCA Common Criteria for all Qualifications that proof of authentication is received.

Guidance on assessment and evidence requirements

An OCR model assignment is available for this unit and can be downloaded from our website: www.ocr.org.uk .

Candidates may provide portfolio evidence for this unit using a range of suitable and appropriate techniques which may include written data along with printouts and screen shots, annotated where necessary to explain what is being shown. Where evidence cannot be easily included within the portfolio, assessor testimony/witness statements must be included, signed by the assessor(s), and supported by appropriate evidence.

The assessment objectives for this unit cannot be achieved without designing and creating a database. Suitable database software must be provided by the centre to allow candidates to do this. It must be noted that for higher grades, a relational database must be developed – so the choice of software must allow the creation of a multiple table relational database.

For Assessment Objective 1, candidates must provide details of the design of their database, including details of the purpose and audience of the database. For Pass, a flat file, single table database is sufficient. For higher grades, candidates must design a relational database. It is therefore important that the scenario/assignment undertaken by the candidate provides sufficient scope for both types of database to be designed and developed.

For higher grades the relational database should include two or more tables. For each table, candidates must indicate the table structure and relationships to be created. Validation, in the form of combo boxes, validation rules and input masks (or equivalent), is required beyond Pass level. Data entry forms must be designed at all levels. Higher level students may want to customise the design of their data entry forms, adding increased functionality etc. At Pass level, not all design choices have to be appropriate; they must, however, allow the database to function in order to achieve all the other assessment objectives.

For Assessment Objective 2, candidates must produce a functional database they have designed. They will ensure the database includes sufficient records to meet the specified needs. Meaningful searches and sorts must be possible using the data – this will be unlikely where a database has fewer than thirty records in total. All candidates will create at least one form to enter data. At Pass level, the database will mostly reflect the design work undertaken. For Pass, one form must be

created for data entry. For higher levels some customisation of data entry forms is required. For Distinction, this must include some increased functionality – for example in a DVD shop database system, a form for input of loans to customers may have additional functionality by the inclusion of a sub-form displaying customer and/or DVD details. Other example may be: adding an exit button to a form to close the form and open the main menu; adding a button to run a query etc.

For Assessment Objective 3, candidates will perform a range of sorts and queries. As a minimum candidates must describe the purpose of the queries used. Higher level candidates must explain or justify their choice of queries. Evidence of both the design and output of the queries must be provided by the candidate.

Further information regarding types of queries, providing guidance on what is meant by simple, complex and multiple n queries is shown below:

- Simple criteria where the exact target is entered/selected, eg
  - =
  - Null
- multiple criteria, where criteria for more than one field are entered, eg
  - AND
  - OR
- complex criteria, where the criteria involve more than simple '=' requirements eg:
  - comparative criteria using <, >, BETWEEN, etc
  - wildcards, eg: * ? #
  - parameters
  - OR (in the same field)
  - NOT

For Assessment Objective 4, candidates will use the software to produce reports. At Pass level, candidates may simply use standard templates provided. Beyond Pass level, candidates will need to demonstrate that they can customise existing templates or create their own.

Assessment Objective 5 requires candidates to implement a user interface, giving the user access to various parts of the database. This could take the form of a switchboard or customised form, which could make use of a range of macros.

Assessment Objective 6 requires candidates to test their database. They should carry out the tests and evidence this through a completed test plan, using a checklist etc. Candidates do not need to provide screenshots showing the actual tests being carried out. If the tests identify any issues concerning the functionality of the candidates' database then it is expected that they will make the necessary changes. Candidates should not invent problems simply to show that they are able to correct them. However, the extent to which the final database solution provides an accurate solution of user needs is a key differentiator. It is important, therefore, that where corrections/improvements are made there is clear evidence of these, which might be provided by before/after screenshots or by providing an electronic copy of the final database.

Mapping to national occupational standards

The mapping in the table below provides an indication of where evidence might be available for assessment against some of the knowledge and understanding contained in the national occupational standards (NOS). It does not claim to guarantee that evidence will meet the NOS.

Occupational standards	Unit number	Title
IT Users (e-skills UK)	DB2	Database software Level 2
IT Practitioners and Professionals (e-skills UK)	ITPDADSD	Data analysis and data structure design
IT Users 2009 (e-skills UK)	DB:B	Database software
IT Users 2009 (e-skills UK)	DMS:B	Data management software
IT Users 2009 (e-skills UK)	IPU: B	Improving productivity using IT
IT Users (e-skills UK)	WP2	Word processing software Level 2
IT Users 2009 (e-skills UK)	WP:B	Word processing software
IT Practitioners and Professionals (e-skills UK)	ICTTEST	Testing ICT systems Level 2

Signposting to functional skills

✓ The unit contains opportunities for developing Functional Skills.

Functional Skills Standards					
English		**Mathematics**		**ICT**	
Speaking and Listening		Representing	✓	Use ICT systems	✓
Reading	✓	Analysing		Find and select information	✓
Writing	✓	Interpreting		Develop, present and communicate information	✓

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 current at the time of production.

Kelsall, Manson, Parry	*Units 6&7 OCR Level 2 National Certificate in ICT Student Book* Payne-Gallway ISBN: 9781905292127
Heathcote, F R	*Basic Access 2000-2003 & Teachers Book* Payne Gallway ISBN: 9781904467786
Oppel, A	*Databases Demystified* McGraw-Hill Education ISBN: 9780072253641
Bowman & Jones	*OCR National Level 2 in ICT Student Book with Dynamic Learning CD-ROM* Hodder Arnold. ISBN: 9780340942017, ISBN-10: 0340942010
Thomas Telford Online	*OCR Nationals in ICT* Thomas Telford Online

Websites

URL:http://office.microsoft.com/en-gb/officeupdate/default.aspx
Microsoft Office On-line - Provides up-to-date guidance on how to use Microsoft Office.

http://www.theteacher99.btinternet.co.uk/theteacher/gcse/newgcse/module5/task1.htm
Teacher and revision notes

http://www.bbc.co.uk/schools/gcsebitesize/ict/databases/index.shtml
A secondary revision resource for GCSE exams

http://www.geekgirls.com/menu_databases.htm
Provides a step-by-step guide to using databases

Grading

Assessment Objective	Pass	Merit	Distinction
AO1 Design a database to meet the needs of an organisation	Candidates will produce a basic design for a database in line with identified user requirements. The design will include basic details of: table structure, primary key, field names, field types, field lengths and an input form. The database will bear some resemblance to the design work undertaken.	Candidates will produce a design for a relational database in line with identified user requirements. The design will include details of: table structures, primary keys, field names, field types, field lengths, combo boxes and validation rules, relationships and input forms for each table. The design should be sufficiently detailed to enable others to produce the database with some explanation. The database will reflect the design work undertaken with any deviations from the original design identified.	Candidates will produce detailed designs for a relational database in line with identified user requirements. The design will include comprehensive details of: table structures, primary keys, field names, field types, field lengths, combo boxes, validation rules, input masks (or equivalent), relationships and custom forms for each table. The design should be sufficiently detailed to enable others to produce the database. The database will reflect the design work undertaken with any deviations from the original design justified.
AO2 Construct the database according to the design	Candidates will construct a database based upon the design work undertaken. A form will be created to enter data in the table. They will ensure the database includes sufficient records to meet the specified needs. The database will mostly reflect the design work undertaken.	Candidates will construct a relational database based upon the design work undertaken. Forms will be created to enter appropriate data in each table. At least one form will be customised. They will ensure the database includes sufficient records to meet the specified needs. The database will reflect the design work undertaken.	Candidates will construct a relational database based upon the design work undertaken. Custom forms will be created to enter appropriate data in each table. At least one form will be customised to add functionality. They will ensure the database includes sufficient records to meet the specified needs. The database will match the design work undertaken.

Assessment Objective	Pass	Merit	Distinction
AO3 Interrogate the database	Candidates will create at least two queries to select information to meet specified needs, at least one will use multiple criteria and at least one will include a sort. They will state the purpose of each query. The query results will meet the specified needs.	Candidates will create at least two queries to select information to meet specified needs. At least one query must include data from more than one table. At least one query will use complex criteria and at least one query will use multiple criteria. One of these queries will include a sort on at least two fields. They will state the purpose of each query, giving reasons for the query design chosen. The query results will meet the specified needs.	Candidates will create queries to select information to meet specified needs. At least one query must include data from more than one table. At least two queries will use different complex criteria and at least two queries will use multiple criteria. One of the queries will include a sort on at least two fields. They will state the purpose of each query, justifying the query design chosen with reasons for rejecting alternatives. The query results will meet the specified needs.
AO4 Create reports	Candidates will produce at least two different types of report, at least one of which must be based on a query. Reports will be appropriate to the data being presented.	Candidates will produce at least two different types of report, at least one of which must be based on a query and at least one will be a customised report. Reports will be appropriate to the data being presented.	Candidates will produce at least three different types of customised report, at least one of which must be based on a query. Reports will be appropriate to the data being presented.
AO5 Create a user interface	Candidates will create a user interface. The user interface will give access to some of the main areas of the database. The user interface will meet some of the needs of the intended user.	Candidates will create a user interface. The user interface will give access to the main areas of the database. The user interface meets most of the needs of the intended user.	Candidates will create a user interface. The user interface will give access to the main areas of the database. The user interface meets the needs of the intended user and is user-friendly for non-expert users.

Assessment Objective	Pass	Merit	Distinction
AO6 Test the database	Candidates will provide evidence of some testing. Candidates will make improvements to the functionality of their database **if** issues are identified through the tests they have carried out.	Candidates will provide evidence of testing most of the main areas of the database (as shown in the KUS). Most tests will be appropriate. Candidates will make improvements to the functionality of their database **if** issues are identified through the tests they have carried out.	Candidates will provide evidence of testing all the main areas of the database (as shown in the KUS). All tests will all be appropriate. Candidates will make improvements to the functionality of their database **if** issues are identified through the tests they have carried out.