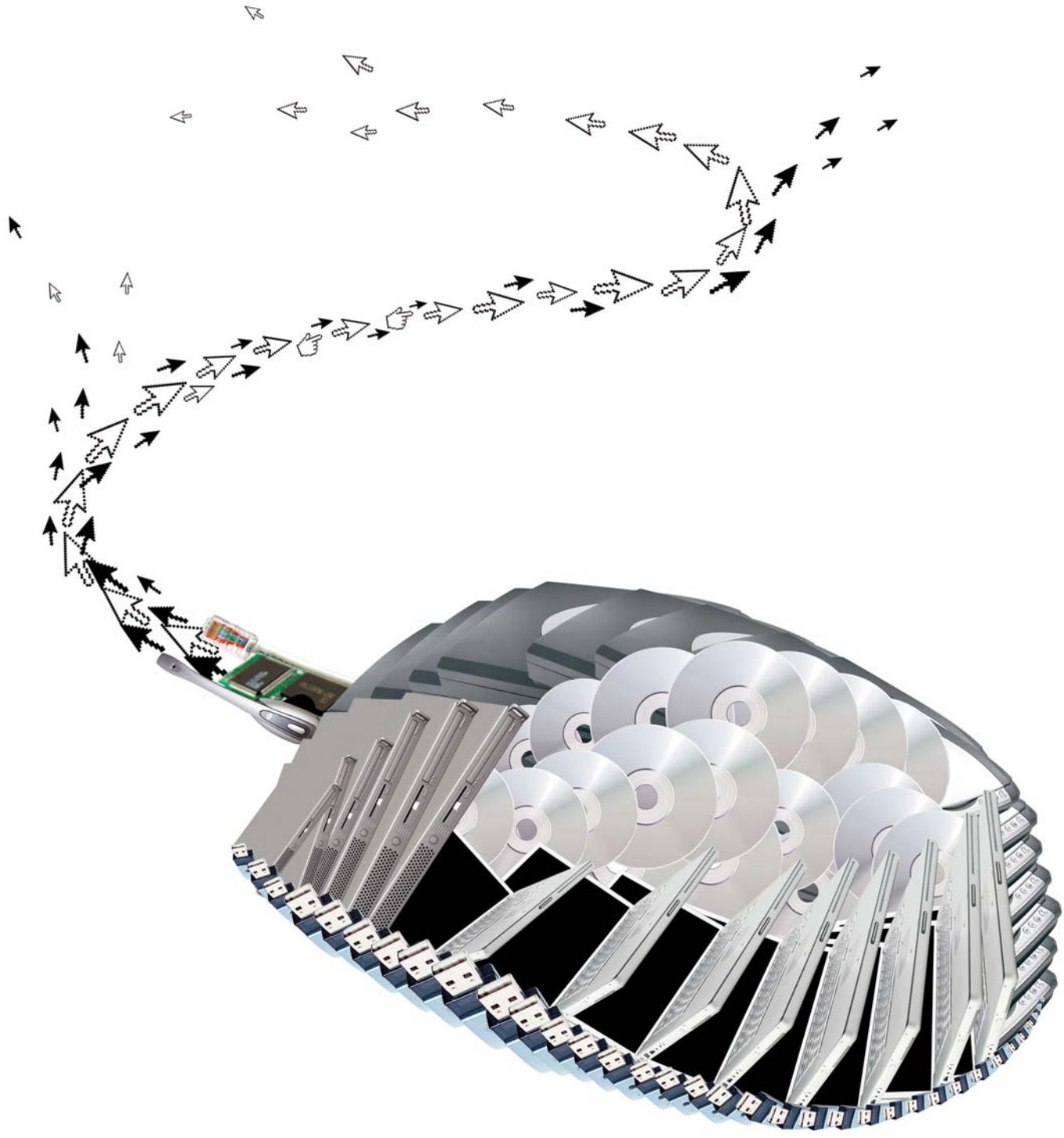
Level 3 - Sample scheme of work
(7343)

IT

Unit 3: Professional development
Unit 4: Creating technology solutions



IT
Level 3 Unit 3: Professional development
Level 3 Unit 4: Creating technology solutions
Sample scheme of work

This is an example of a possible scheme of work. You can use it as it is, adjust it or extract content to create a scheme of work to suit your delivery needs. It can also be adjusted by adding theory workshops to support learners who have/need additional learning time.

Total GLH	180
Aim	**The purpose of Unit 3** is for learners to develop their capacity to assess the strengths and weaknesses associated with a current business situation and to propose technology-enabled solutions to problems associated with it. Learners will have the opportunity to apply a range of structured methods for obtaining, handling and documenting information, and to make persuasive arguments in a business case for improvements to the current situation using communication and mathematical skills. Learners will be able to: • undertake a structured business analysis and present an effective business case, supported by appropriate use of English and mathematics and statistical analysis • understand the importance of good communication and how a business uses different methods of communication to operate effectively in the modern business environment • communicate effectively in a variety of business situations, using a range of different communications media and personal styles • understand the principles of professional ethics and recognise standards of professional behaviour. **The purpose of Unit 4** is for learners to develop their skills in the production of technology solutions that solve real business problems. Learners will be able to: • understand what makes up a technology solution, what the purpose of a technology solution is, how interaction between the key components of a system is enabled, and how differing technology solutions interact and integrate • understand the principles of the systems life cycle and how to develop a requirements specification based on business analysis

	• design, construct, test and implement a small-scale technology-enabled solution to meet organisational business needs • evaluate the design, usability and fitness for purpose of the technology-enabled business solution, and to suggest improvements.
Notes	Units 3 and 4 are both assessed internally, through the development and presentation of a business case for a technology-based solution in Unit 3, and then the development of the solution in Unit 4. The AQA–City & Guilds Assessment Guidance document, which can be found at www.diplomainfo.org.uk/documents/IT_Advanced_Diploma_-_Assessment_Guidance.pdf, explains the requirements of these two units and how they can be linked together. Note that 'The system must be a relational database and there should be an element of coding which may be SQL, a user interface created in HTML, a link to a website using ASP, VBA scripting and so on.' The Cattery System example and the examiner's commentary provided by AQA–City & Guilds have been used extensively in this scheme, and can be found with other exemplar material at www.diplomainfo.org.uk/IT-Internal-SAMs.asp, under Units 3 and 4. The Marking Grids are at the bottom of this web page too, and these must be used by teachers when assessing the work. See also the Instructions on the use of Marking Grids. Teachers should also ensure they are familiar with the advice and ground rules for internal assessment, in Section 4 of the AQA Principal Learning Specification: www.diplomainfo.org.uk/documents/IT_Level_3_Principal_Learning.pdf. Under FS (functional skills): * indicates opportunities for assessment in English of speaking and listening and/or written communication + indicates opportunities for use of functional mathematics Colour coding: Rows in this colour are mainly for Unit 3 Rows in this colour are mainly for Unit 4 Rows with no colour combine work for both units

Topic	Activities, assignments, assessments, resources	LO and AC	PLTS	FS	GLH	Other comments
1 Introduction to the units and assessment method	Present an introduction to the unit and follow with a class discussion. Answer any questions from learners. Give examples of the type of project to be undertaken, eg Cats Cattery (AQA–City & Guilds example) to cover the two units.	Units 3 and 4, all AC			1	These units draw from Units 1 and 2, and will also make use of experience gained during Unit 6: Making Projects Successful.
2 Identify technology solutions in use in a range of business scenarios	Introduce the topic using real examples and/or case studies such as those provided by QIA on http://ntlcp.qia.org.uk/it/commercialcasestudies/default.htm Learners should investigate some of the examples in more depth.	Unit 4 AC1a	IE CT		2	Links to Unit 1.
3 Investigate existing technology solutions	Learners should investigate technology systems used by contacts or in work experience.	Unit 3 AC1c Unit 4 AC1c	CT		1	Links to Unit 1.

4 Relational databases Practical work to learn how to use a database package	Demonstrate an example of a relational database to show the uses of tables, forms, queries, reports and macros. Show relationships and primary and foreign keys. Provide step-by–step instruction and practical work to allow learners to create a database for a given case study, using a suitable textbook, worksheets or online tutorials.	Unit 4 AC3a	SM		15	This topic will be spread over several weeks to provide variation in activities.
5 Database design and data structures	Using the same case study as in the practical work (and the Cattery system as an example) introduce the following: • Data dictionary • Entities and attributes • Entity relationship diagrams • Normalisation Use the Active Learning packs that are available in most schools and colleges (Mia's Sandwich shop and Phoenix Circus School). These are also downloadable from http://teachingandlearning.qia.org.uk/resource/su_ict_intactcd/default.htm and downloads on http://teachingandlearning.qia.org.uk/resource/su_ict_teachrescd/learneractivities/ There are ideas for using the resources on: http://ntlcp.qia.org.uk/it/videobank/usingtheactivities.htm and http://teachingandlearning.qia.org.uk/resource/su_ict_introrescd/practice/default.htm	Unit 4 AC3a			6	This topic will be spread over several weeks to provide variation in activities.

6 Analyse and describe a range of business processes within example organisations	Learners are presented with several different business processes within real organisations. As a class or in groups, with guidance from the teacher, learners should examine how they currently operate, and identify weaknesses and opportunities for improvement via technology. Organisations could be found through work experience or part-time jobs, from visiting speakers or visits to local business. Case studies may be valuable too. This could be documented for example by a whole class brainstorming session recorded on a smartboard and saved to the VLE, or by means of a class display with contributions from each learner.	Unit 3 AC1b Unit 4 AC1a	CT IE		4	Links to Units 1 and 2.
7 Recognise key components of technology systems	Carry out a class session to identify the likely components of a technology system: hardware, software, data, procedures, people, networking, security. Examples could relate to school/college.	Unit 4 AC1a			1	Links to Units 1 and 7.
8 How different technology systems in a business integrate and interact	Discuss with the class: Is data shared within different departments of the same organisation? Are systems linked? Use previously identified examples to explain: • Why more than one system may be needed • Distributed and centralised systems • Systems that feed into one another • Need for standards • Sharing of data • Security and networking issues	Unit 4 AC1b			2	Progresses from Unit 1.

9 The structured approach	Introduce the idea of the systems life cycle, including modelling and prototyping. Talk about the different types, eg waterfall, linear, iterative. There are lots of useful websites available eg www.freetutes.com/systemanalysis/sa2-waterfall-software-life-cycle.html Discuss the Cats Cattery problem and challenge learners to create a workable systems life cycle diagram for this problem.	Unit 3 AC1a Unit 4 AC2a, b	IE SM		3	Links to Unit 6.
10 Importance of structured processes	Explain the need for a structured process like the systems life cycle. Suggest the problems that can occur with non-standard approaches. A role play activity could be used to demonstrate the possible misunderstandings caused by non-standard approaches.	Unit 3 AC1a Unit 4 AC2a	CT		1	Links to Unit 6.
11 The feasibility study – overview	Ask learners to study a completed example project report such as 'Cats Cattery'. Identify the different sections of the report, concentrating on the initial sections of Background, Problem statement, Investigation and Summary. Deduce how the analysis and feasibility study have been carried out: stages of the work, investigative techniques used, user requirements identified, other factors involved.	Unit 3 AC1a, b Unit 4 AC2c	IE	*	2	Links to Unit 6.
12 The business problem	Explain what information is required in the first sections: background, investigation, current system and its problems, resources available, user skills, etc. Use examples of business analysis to show how these sections can be written.	Unit 3 AC1a, b		*	1	

13 Introduction to data flow diagrams	Use the Cattery example to see what the Data Flow Diagrams (DFDs) are showing. Carry out an activity to work out which items are expanded in each DFD as they are built up from Level 0 to 3.	Unit 3 AC1a, b	IE		1	
14 User requirements	Use an example to see how user requirements are built up from the earlier sections of the project report. Divide learners into teams for an activity relating to the Cattery example, matching findings with requirements.	Unit 3 AC1a, b Unit 4 AC2c			1	
15 Teamwork, personal styles and behaviours Start reflective logs	Present an introduction to body language/behaviours. Video examples from YouTube or similar could be used to illustrate the concepts. Conduct a class session to discuss team roles. Learners should identify their own role and behaviour in group work carried out in the previous session, or another current unit. Learners should start to create individual reflective logs on their personal performance. The logs can be handwritten, word processed, presented as a blog (but may be too public), or an audio recording (using mobile phone, very carefully saved!).	Unit 3 AC4a, e	TW RL		2	Draw on teamwork experience in other current units.
16 Possible solutions	In teams, learners should think up possible solutions for the Cattery. Two solutions are provided, but other variations should be added, eg alternative database packages, off-the-shelf packages, programmed solutions or enhancement of the manual system. Other technology besides IT could also be considered, eg using microchips on the cats. Learners should produce a description of the main points of each idea.	Unit 3 AC1c Unit 4 AC2d	TW		2	

17 Work in a team to compare benefits of possible solutions	Learners should consider the benefits of each possible solution, both quantifiable and non-quantifiable, and make a list.	Unit 3 AC1c AC3d	CT		1	
18 Spreadsheet revision	Ask learners to practise calculations using spreadsheets, depending on their previous experience.	Unit 3 AC1c AC3c		+	2	
19 Work in a team to compare costs of possible solutions	Learners should consider and research the costs of the hardware and software that would be needed for different solutions. This task can be shared within a team. Add training and any other initial costs. Introduce revenue costs and estimate some of them for the Cattery example. Ask learners to evaluate teamwork: roles, contributions, body language. Learners need to update their reflective logs.	Unit 3 AC3d (v) AC4a, e	IT	+	2	
20 Possible solutions, including costs and benefits	Use sample material about the Cattery to see one approach to this topic. Learners must create a Cost Benefit Analysis (CBA) in a spreadsheet and add appropriate graphs or charts. Both capital and revenue could be included as well as projected Return on Investment (ROI) over three or five years with a break-even point. An example and some background are given on www.mindtools.com/pages/article/newTED_08.htm Carry out an activity to improve the CBA in the Cattery example (as it only gained one mark).	Unit 3 AC1c AC3c Unit 4 AC2d		+	3	The concept of benefits, opportunities, risks and costs arising from the introduction of new or different technology was studied in Unit 1.

21 Identify and confidently apply relevant mathematical techniques: Risks	Introduce the concept of risks to a system using examples. Use the Cattery example to see the risks identified. Ask learners to work out the potential costs of the risks. Estimation of risks can be carried out using statistical analysis. Is the recommendation still the same?	Unit 3 AC1c AC3c	IE1	+	2	
22 The impact of ethics, corporate social responsibility, professionalism and codes of practice on the organisation	Present a general introduction to ethical issues, including examples of corporate social responsibility from real companies, perhaps one that is currently in the news. The website www.mallenbaker.net/csr/index.php includes case studies. Learners could conduct their own research and produce a presentation in teams. They could then use the previous session's outcomes to evaluate their own role in teamwork. Learners need to update their reflective logs.	Unit 3 AC4a, c, e	TW IE	*	2	
23 Implications of current legal requirements related to digital technology	Present an introduction to relevant laws related to digital technology, eg Data Protection Act, Copyright Designs and Patent Act, Computer Misuse Act, Health and Safety at Work Act, EU Health and Safety Directive 87/391, DDA, Human Rights Act. Divide learners into teams. Each team should study one of the laws and work out how it applies to a given case study.	Unit 3 AC1a AC3a AC4d	IE	*	1	Units 1, 2 and 7 also refer to this topic.

24 Legal implications and professional ethics	Consider the legal implications and professional ethics for the Cattery example. Learners should add their own ideas to this section of the example report.	Unit 3 AC4c, d	IE		1	
25 Policies for working with digital technology	Present an introduction to policies, eg IT Security Policy, Health and Safety policy, to ensure employees work within the law. Ask learners to work out which policies are relevant to which laws. Learners must produce an IT Security Policy for the school or college, or another familiar organisation.	Unit 3 AC4d	IE	*	2	
26 Recommended solution	View the Cattery example to see the solution chosen and the reasons why, relating the solution to the client's requirements and other factors identified. Ask learners to list the advantages and disadvantages of all the solutions that were considered. Carry out an activity to improve on this section of the Cattery report.	Unit 3 AC1a, b Unit 4 AC2e	IE		2	

27 Analyse and describe a range of business processes within example organisations	Learners should be presented with several different business processes within real organisations. As a class or in groups, with guidance from the teacher, learners should examine how the business processes currently operate and identify weaknesses and opportunities for improvement via technology. Organisations could be found through work experience or part-time jobs, from visiting speakers or visits to local business. Case studies may be valuable too. This could be documented by a whole class brainstorming session recorded on a smartboard and saved to the VLE, or by means of a class display with contributions from each learner.	Unit 3 AC1b		*	4	Links to Unit 2 AC1.
28 *Assessment task* Identify a business problem	Each learner will need a business problem/opportunity for the assessment tasks, related to a real local employer, which could be solved by means of a relational database system as required for Unit 4. Learners must write an introduction/background and briefly explain the problem or opportunity.	Unit 3 AC1b Unit 4 AC2c	IE EP		2	
29 Presenting formal reports	As a class, discuss professional standards for documents, including templates, logo, presenting numbers in tables or charts, etc. Evaluate the methods used in the Cattery report – both the analysis methods, diagrams, etc, and the use of a template, consistent 'look and feel', and so on. Learners must complete an exercise to create their own template and styles, automatic table of contents, page numbers, etc.	Unit 3 AC3b, d		*	2	

30 Methods of finding information	Present an overview of the different methods of finding information: • Questionnaires • Interviews • Observation • Document analysis As a group, learners must present a critique of the investigation section in the Cats Cattery example.	Unit 3 AC1c	TW EP		1	
31 Personal data	As a class, discuss the process of collecting personal data and any possible worries that may entail. Use the QIA Data Comfort Zones activity (to be found on http://ntlcp.qia.org.uk/it/activities/datacomfortzones.htm) to understand the possible reluctance of people to answer personal questions, and techniques for obtaining appropriate data.	Unit 3 AC1b AC2b AC4a, c	EP CT		2	
32 Questionnaires and interviews	Discuss types of questionnaire (open and closed questions, tick boxes, etc) and when to use them. Follow with a discussion on the uses of interviews, who to ask (stakeholders), type and number of questions, recording the answers, professional approach. Who should conduct the interview? (team or individual) The following website may be useful: http://ntlcp.qia.org.uk/it/activities/datacomfortzones.htm Ask learners to consider ways of analysing results. Ask learners to compare the questionnaire and interview as methods for finding out information.	Unit 3 AC1b AC2b AC3d			2	

33 Document analysis Read and respond to a range of relevant documents	Create an activity to help learners identify different types of business document and what they are used for. Extract information from the documents that is relevant to the business problem.	Unit 3 AC1c AC3a	IE	*	3	
34 Observe business processes	Ideally, arrange a visit to a workplace so that learners can observe processes such as making and recording sales or creating production schedules or job rotas. Identify the relevance of the observed processes to the business problem and why observation is the best method here. Learners need to update their reflective logs.	Unit 3 AC1b, c AC3a AC4a, e	RL	*	3	Links to Unit 2 AC1.
35 *Assessment task* Own interviews and/or questionnaires	Learners should write questions for their planned interviews and/or questionnaires. Discuss the impact of personal style/behaviours when gaining co-operation from business contacts. Learners must prepare questions and then conduct the interviews and/or questionnaires and consolidate the results. They should explain their choice of method and the impact of personal style/behaviours. Learners need to update their reflective logs.	Unit 3 AC1b AC2b AC3d AC4a, b, e Unit 4 AC1c	IE RL	*	4	

36 *Assessment task* Carry out and document further investigations	Learners will: • decide on the best method, or combination of methods, for further investigation of their own business problem (document analysis, observation, follow-up interviews, email, etc) • carry out the investigations • document all the findings (user requirements, user skills and existing resources) • check back with the client. Learners could revisit the feasibility study (Cattery example) in order to see how user requirements are built up from the earlier sections.	Unit 3 AC1a, b AC2b AC3a, d AC4a Unit 4 AC1c AC2f	IE SM	*	4	
37 Inputs, processes and outputs Creating Data Flow Diagrams	Learners to do exercises to identify inputs, processes and outputs for an example case study, and learn how to create a Level 0 DFD. Learners need to create a Level 0 DFD to include some of the wider business functions of the Cattery (not included in the example work). Show how to delimit the part of the system being analysed. Provide development exercises for Levels 1–3 DFDs.	Unit 3 AC1a, c			4	

38 *Assessment task* A detailed description of the current operations of the system under investigation and how the system ties into the overall business	Learners must analyse data flows and describe the current system for their own project. They should: • identify inputs, outputs and processes, including full documentation of how the problem fits into the wider business functions • identify key components • create DFDs, including a context diagram that clearly delimits the scope of the investigation • describe the current system • identify and describe the problem to be solved or opportunity for improvement • check back with the client.	Unit 3 AC1a, c Unit 4 AC1b, c	SM		8	
39 *Assessment task* Compare possible solutions	Learners should: • identify and describe at least three possible solutions for their own project • describe and analyse benefits, costs and risks for each solution, including the possible impact on the business • choose and justify one solution • carry out a cost benefit analysis for the chosen solution.	Unit 3 AC1c AC3c, d (v)	SM CT IE	* +	8	
40 *Assessment task* The feasibility study	Learners must complete the formal report of the feasibility study and ensure it meets professional standards and takes into account environmental factors. The formal report should be completed using correct, contextually appropriate and effective English.	Unit 3 AC3b, d	SM	*	5	
41 Implementing the business solution with users	Present an introduction to methods of implementation including big bang, phased, parallel and pilot adoption methods. As a group, discuss the most appropriate method of adoption for different scenarios.	Unit 4 AC3e	CT		1	

42 *Assessment task* Create an executive presentation	Learners must create a 15-minute executive presentation to be delivered to the business client, summarising: • the structured approach taken to the task • findings • recommendations for the new system • recommended implementation method.	Unit 3 AC1c AC3d	EP		3	
43 *Assessment task* Deliver an executive presentation	Learners should deliver their presentations, if possible to the client, who should complete an observation form including comments on both content and delivery. Video evidence or an audio recording could also be used. If necessary, the teacher may take on the role of the client.	Unit 3 AC1c AC3b, d	EP		1	
44 *Assessment task* Evaluate communication work done so far	Conduct a class activity to list all the communication methods and media used so far, and what they were used for. Individually, learners must create a table to include: • the media used • why the different types of media are appropriate • a column for professional ethics, where relevant • an evaluation of their own performance • how accuracy has been ensured. This table will be used in the final assignment.	Unit 3 AC2a, b	RL		1	

45 *Assessment task* Personal evaluation	Learners must complete a personal evaluation assignment. They should include an evaluation and justification of the methods and media used in their formal report. The evaluation of their presentation should include justification of the media used, the quality of the presentation itself and their own performance in delivering it. They should also evaluate their personal performance when communicating one to one, working in teams, meeting deadlines, etc (including own Personal Performance Reflective Log and adding a Personal Development Plan).	Unit 3 AC4a, b, e	RL		5	
46 *Assessment task* Create designs for own database structures and processes	Learners must create detailed designs for their own database. They could use the Cattery example. They should include database structure and processes. The solution processes should be explained in structured English. Learners could use: • Data dictionary template • Query design templates • Process design templates	Unit 4 AC3a	CT		5	Links to Unit 6 AC2.
47 *Assessment task* Create test plan for own database	Present an introduction to the different types of testing: • Testing the interfaces, data structures and solution processes. Test data: normal, boundary, extreme and erroneous data • Testing the whole system – trying to provoke failure • Testing usability Carry out an activity to add further tests to the Cattery project (see commentary).	Unit 4 AC3a, c	CT RL		5	Links to Unit 6 AC2.
48 *Assessment task* Create the database structure	Learners must use database software to produce related tables for their own technology solution.	Unit 4 AC3b	CT		3	Links to Unit 6 AC2.

49 Designing an effective Human Computer Interface (HCI)	Introduce the rules for effective HCIs during a class discussion. Look at examples of good and poor HCIs. Learners could investigate examples on the internet.	Unit 4 AC3a	CT		2	Links to Unit 6 AC2.
50 *Assessment task*	Learners should start to create database forms and reports, including their own HCI to meet users' needs.	Unit 4 AC3b	CT		2	Links to Unit 6 AC2.
51 *Assessment task* Implementing the HCI	Learners must show and explain their choices of HCI to others in the class. Learners should offer constructive criticism to each other, and make improvements. Consult the clients to check the suitability of the HCI chosen and alter if necessary. Record the process in a personal reflective log, including how ideas are expressed to avoid offence, and whether the process was helpful or demotivating.	Unit 4 AC3b AC4a	EP RL		2	Links to Unit 6 AC2.
52 Adding simple coding or scripting	The teacher should demonstrate examples of simple coding, eg SQL, a user interface created in HTML, a link to a website using ASP, VBA scripting. Ask learners to investigate other examples on the internet. Learners need to decide on the appropriate use of coding in their own databases.	Unit 4 AC3b			2	
53 *Assessment task* Complete database solutions	Learners must complete their database solutions, including appropriate queries, forms, reports and macros and some coding.	Unit 4 AC3b	SM		15	

54 *Assessment task* Testing the solution	Learners must apply their test plans and record all results. They should modify the database if necessary and keep a record of any modifications to the original designs. Learners must also keep a record of any limitations discovered, for use in the evaluation stage.	Unit 4 AC3c	SM RL	*	10	Some of this work is best carried out during the implementation, to make sure errors are corrected early on. However, learners must record all testing whenever it is done.
55 *Assessment task* Producing a user guide	Present an example of an appropriate user guide, showing content and layout. Learners must create their own user guide templates. They must then produce an illustrated user guide for their own system.	Unit 4 AC3d		*	3	
56 *Assessment task* Review and evaluate the finished product	Carry out a final review of the new system with the client. Learners could use a questionnaire to check client satisfaction. Client should make comments on strengths and weaknesses, by filling in a form or by writing a letter. The evaluation should explain: • capabilities and limitations of the solution • how well it meets the original user requirements • improvements that could be made, and have been highlighted by the client • plans and priorities for improvement • how feedback from the end user is reflected in the evaluation and in the possible improvements.	Unit 4 AC4b, c	RL	*	5	Links to Unit 6.