Contents

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National Strategy publications referred to in this booklet are available at the following website address:

www.standards.dfes.gov.uk/keystage3/publications

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Introduction

Background to the series

This booklet is designed to help ICT departments plan for effective transition from Key Stage 3 to Key Stage 4 by creating teaching and learning plans that bridge the key stages. In the literal sense, a bridge has two ends. Bridging plans will be effective only if teachers give thought to how the work at the end of Year 9 can be linked with the beginning of Year 10.

From a pupil's perspective, moving from Key Stage 3 to Key Stage 4 may be less marked than other key stage transitions because it does not usually involve a change of school. However, there are other milestones for consideration as pupils enter Key Stage 4. Perhaps for the first time in their lives, pupils make choices about the subjects they will study and, to some extent, the paths they will follow. They also become aware of how GCSE courses will be different, for example in having an element of assessment by coursework.

Many ICT departments use time in the latter half of Year 9 to offer pupils opportunities that complement or extend the work they have been doing previously. For example, some departments work to develop pupils' ability to problem-solve and operate within the system life cycle; others highlight aspects of the curriculum content which will be different in Key Stage 4.

The aim of these materials is to suggest additional ways in which you could help pupils make a confident start to Key Stage 4, particularly by making best use of the time in Year 9 after the completion of teacher assessments. This is not just about starting examination courses early: it is about stimulating pupils' interest and keeping them engaged. It is also about creating a sense of moving on, with an expectation of increasing maturity and independence as a learner. The aim should be to develop bridging plans that can be incorporated into a scheme of work and, with appropriate revision, used from year to year.

How to use this booklet

A suggested sequence of steps is to:

- read the booklet and reflect on the suggestions it contains – you might want to encourage other colleagues to do so as well
- take your thoughts to a meeting of the department:
  - highlight some general points from the booklet
  - review what you currently do in Year 9 after teacher assessment and the first few weeks of Year 10
  - consider possibilities for development, perhaps using the summary of suggestions on page 8 as a starting point
  - agree on the changes you want to make, possibly delegating detailed development to a smaller group
- allow time to review the implementation of your plan and make changes for future years.

Developing independent learners

Increasing numbers of departments recognise the need to think about pupils, not only in terms of their capabilities in the subject, but also in terms of their learning skills. Maturing towards independence is gradual; pupils do not suddenly change as they move from one key stage to another. However, the transition between Key Stage 3 and Key Stage 4 provides an opportunity to refocus attention, of both teachers and pupils, and to set up activities that could have a positive impact on pupils' learning skills.

Expectations for the end of Key Stage 4

Pupils who are effective learners have the skills to learn on their own. They can be relied on to work independently, even for long periods. One LEA worked with teachers to identify statements that describe effective learners at different stages of their development. These statements identify the learning skills that pupils need to be taught. The following statements are for the end of Key Stage 4.

By age 16 effective learners:

- are well organised and plan their work confidently, balancing priorities
- show independence in solving problems, selecting the most effective strategy with confidence and seeking help when needed
- gather information efficiently and take notes in a variety of ways, selecting the method to suit the purpose
- can reorganise their work and present it with a clear sense of audience
- are effective team members and can recognise the different roles needed to complete a task and will often take on that role to ensure completion
- search for a purpose for learning and will challenge and question to ensure that what they are learning is appropriate
- explore how this new learning fits with existing knowledge and accommodate any changes to their overall 'map'
- assess their own work and can identify areas for improvement and seek help to clarify how they can improve.

Taking this list as a goal, think about some of your current Year 9 pupils. What steps do they need to take towards becoming independent learners?

Strategies for developing pupils' learning skills

Pupils are more inclined to give up when they meet a challenge and to opt out of discussion and group work if they have not fully developed the skills needed to work independently, and if their organisational skills are weak. Such pupils require particular support. However, the need to develop learning skills is not confined to these pupils. As they grow older, *all* pupils need to acquire a greater perception of themselves as learners.

Research shows that pupils can be taught to become more independent in their work and thus become more effective learners. It often pays to start small, by concentrating on a particular learning skill, such as organising information.

- Model for pupils how the particular skill is carried out.
- Select tasks carefully to match your goals and to ensure that pupils experience success.
- Give good examples and make clear what are the criteria for success.
- Monitor individuals and the whole class and deal with difficulties.
- Provide positive oral and written feedback, not just marks and grades. As you begin to foster new habits in pupils, gradually increase expectations.
- Set challenging tasks for the whole class, building in necessary support.
- As a whole class, work collaboratively through the stages of solving a problem, gradually reducing the support you provide.
- Focus particularly on understanding problems and planning the solutions.
- Include short spells of carefully structured paired or small-group work.
- Expect pupils to share, comment on and evaluate each other's work.
- Develop thinking skills by raising questions about ways of working and encouraging reflection on strategies for learning.

Note: This section draws on *Pedagogy and Practice: Teaching and Learning in Secondary Schools*: Unit 17: Developing effective learners (DfES 0440-2004).

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ICT: from Key Stage 3 to Key Stage 4

There is a statutory requirement to teach the ICT programme of study in Key Stage 4; this does not mean, however, that all pupils follow an examination course. Pupils considering whether or not to continue their studies beyond Key Stage 3 need to be challenged, engaged and motivated. How can you make the best use of the time available in Year 9 to promote features of studying ICT that make it both exciting and worthwhile? What fresh new challenges can pupils anticipate in Key Stage 4 and beyond?

By the end of Key Stage 3 successful pupils can, to differing degrees:

- use ICT securely, creatively and independently, are confident enough to keep their skills up-to-date and are able to generalise from their ICT experiences. The knowledge, skills and understanding that they need in the subject are closely intertwined (*Framework for teaching ICT capability: Years 7, 8 and 9*)
- operate as increasingly independent users of ICT tools and information sources
- think about the quality and reliability of information, and access and combine increasing amounts of information
- become more focused, efficient and rigorous in their use of ICT, and carry out a range of increasingly complex tasks
- develop their ability to judge when and how to use ICT and where it has limitations.

In Key Stage 4 there are new perspectives to consider when targeting pupils' development within the GCSE tiering structure. Pupils will build on their Key Stage 3 experiences by:

- becoming more responsible for choosing and using ICT tools and information sources
- using a wide range of ICT applications confidently and effectively, and being able to work independently much of the time
- choosing and designing ICT systems to suit particular needs and possibly designing and implementing systems for other people to use
- working with others to carry out and evaluate their work.

The short period at the end of the key stage offers an opportunity to develop pupils' key skills prior to GCSE and vocational courses. In Year 9 teachers will want to decide which skills and contexts developed over the year are most appropriate to the needs of Key Stage 4 learners. They will also want to decide how these projects could help pupils approach their courses in ICT with greater independence.

Selecting bridging projects for development

The ICT bridging projects table, which follows, summarises four possible bridging projects in ICT. Some deliberately build on existing National Strategy materials and Framework objectives and approaches. You will want to select ideas carefully, taking account of what you do currently in Year 9 and the time available. Consider whether you already incorporate bridging activities in your departmental scheme of work. If so, is there value in reviewing what you currently do? If you do not yet use bridging projects, is there value in developing one or more of the projects outlined here? You might find it useful to copy the summary table and use it as a starting point for discussion with colleagues in your department.

ICT bridging projects

Project	Title	Time required	Summary	Page
1	**Developing analysis, testing and evaluation**	4–5 hours	Pupils are supported through the system life cycle with specific emphasis on analysis, testing and evaluation. This is familiar Year 9 work, with additional emphasis on the requirements of testing at Key Stage 4 and the link to the school's chosen examination specification coursework criteria. The use of a design grid and testing schedule is supported through working with peers.	10
2	**Pupil self-assessment**	8–10 hours	Pupils should be encouraged to take increasing responsibility for their own progress as learners. This means knowing what they do well and what they could do better. This project involves assessing their work with the support of peers, using Key Stage 3 criteria and, in Year 10, using GCSE examination criteria.	16
3	**Under-standing Key Stage 4 assessment**	3 hours	Examiners' reports indicate that pupils fail to understand marking criteria and miss opportunities to achieve high marks. This project gives an opportunity for pupils to analyse the criteria for the analysis section of the system life cycle. Using samples of other pupils' work, they suggest areas for improvement.	28
4	**Focus on context**	3–4 hours	Pupils scope an ICT problem bearing in mind the specific requirements of the different assessment criteria for GCSE and Applied GCSE.	35

Implementing your bridging plans

Working with your department

Assuming you are following the guidance on page 3, 'How to use this booklet', and on page 7, 'Selecting bridging projects for development', there are a number of other issues to consider when implementing your plans.

Actively following up in Year 10 the developments initiated in Year 9 should ensure continuity and progression – the essential purpose of your bridging plans. Whether your bridging projects are located mainly towards the end of Year 9, split evenly between Years 9 and 10, or used mainly at the beginning of Year 10, there needs to be an explicit link between the key stages, so that pupils can see that they are developing what they have begun.

Discuss with colleagues how you will overcome potential obstacles to this process. For example, there may be significant changes in pupil groupings and staff allocations between Year 9 and Year 10.

- How can you ensure that these changes will not inhibit what you do and that all pupils gain full benefit from your bridging plans?
- Do your plans involve all pupils in the year group?
- What records or notes will need to be kept by pupils and teachers?
- How will you round off the work in Year 9 and re-engage with it in Year 10?

Detailed planning, which might be delegated to a smaller group of colleagues, might raise various questions to consider.

- What adaptations will you need to make to your scheme of work in order to incorporate the selected projects?
- What new material or adaptations to existing material do you propose to include?
- How will you ensure that teachers are briefed and that resources are prepared in time?

Networking within your school

Effective implementation of plans needs to involve your school's senior leadership team. Support from the leadership team might include, for example:

- coordinating bridging plans across subjects
- fostering development of pupils' learning skills as a whole-school focus through transition to Key Stage 4.

You might seek the assistance of the leadership team in making arrangements such as:

- teacher release to develop ideas
- timetable changes towards the end of term.

Networking with other schools and the LEA

There are considerable advantages to setting up, or linking into, local development groups to pool ideas and perhaps develop shared materials. This is an effective way of making best use of local capacity. Possibilities to consider are:

- linking with one or more local departments to initiate a joint development
- linking into LEA facilities and networks by working with your Key Stage 3 consultant and keeping them informed of developments.

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Project 1: Developing analysis, testing and evaluation

Learning outcomes

By engaging with these activities pupils start to explore and apply the concepts of analysis, design, testing and evaluation. For the purposes of the project the actual implementation is secondary. Pupils in their Key Stage 3 work will have been introduced to analysis, design and evaluation but may have had little experience of testing a system. The project suggests a context in which the task can take place and helps to develop the key skill of **Problem solving**.

Background to the project

As part of their practical assessment in ICT, a significant majority of GCSE (short and full) and GNVQ specifications require pupils to learn about the system life cycle. Pupils are required to apply the concepts to produce solutions to real problems including those from a vocational setting. Pupils will have met the system life cycle in Years 8 and 9. This project looks specifically at taking a very simple context, in ICT terms, and supporting pupils through the analysis, testing and evaluation process.

Resources

- subject specification
- examination board exemplar material
- mark scheme
- examiner's report
- assessment criteria
- task sheet
- Design grid (a)
- Design grid (b)

Structure of the project

Introduction	The teacher supports pupils in listing the tasks that need to be completed and introduces the concept of a successful system.	1 hour
Main body of the project	Pupils use paper to design their outcome, building in checks. They use a design grid to identify steps along the way to test their solution. They proceed to produce a programme with a completed design grid and testing schedule. They use their testing schedule, involving peers when appropriate.	2–3 hours
Conclusion	Pupils produce an evaluation linked to their initial success criteria.	1 hour

Managing the project in Year 9

To enable pupils to succeed, this activity needs to be planned as a whole. At a department meeting the school's particular examination board specification should be used to establish learning outcomes. This will also help in planning for pupils to produce coursework for external examination. You could establish when and how you will assess pupils' work and how to support pupils by checking that they have completed all the sub-tasks.

In reviewing the specification, look at the mark scheme to check on the emphasis. Most specifications have marks available for the five areas of analysis, design, implement, test, evaluate, but these can vary in their weighting.

Use your specification to create an outline scheme for the whole task along the following lines:

Assessment criteria

All pupils will:

- be able to write a list of tasks
- be able to identify success criteria
- design a solution
- design a testing/checking plan
- attempt the implementation
- annotate their solution
- check their solution.

Most pupils will:

- be able to give alternative solutions
- be able to identify detailed success criteria

- design possible solutions and decide on the best
- make improvements
- make an evaluation.

Some pupils will:

- be able to choose and justify the best solution
- develop performance criteria
- explain the need for improvements
- produce a detailed evaluation against performance criteria.

Introduce the context to pupils in the first lesson. An example task using the context of a school sports centre is provided on page 13. The following points, though generally applicable, refer specifically to that task. It is essential that the context chosen and the ICT work carried out should be simple, as the lessons concentrate on the process of analysis, testing and evaluation.

Start by analysing the requirements of the task. Emphasise the importance of first working out what needs to be done and then planning how to do it. Pupils could work in groups and create a spider diagram. Focus pupils on what they think the output will be. Are there any other ways the task could be done? How will they know if the system is successful? Pupils should use ICT to produce a list of tasks.

Next focus on why we need to design before we produce. Model planning the design using pen and paper. Design how to check (test) the implementation. Design grid (a) is provided on page 14 to help focus on the testing element of the cycle. Design grid (b) on page 15 is partially completed.

Produce the programme. Emphasise the importance of testing at each stage, of checking implementation against the list of tasks and annotating areas to be improved. Concentrate pupils on this cycle of do, check, amend – and make sure that the design grid is completed to show evidence of testing and refinement. Food for thought: what would happen if the wrong programme or details were sent out?

Finally, go back to the success criteria to produce an evaluation. Review the process and how it can be used to support development and evaluation of coursework.

Developing the project in Year 10

This project works well at the end of Year 9 or the beginning of Year 10 to ensure a clear focus on the scoping and system life cycle development of coursework. A follow-up in Year 10 would form the start of a long piece of coursework, with the principles of the process and design grid revisited. Pupils could review the elements of the success criteria which indicate the need to develop further before starting the new project.

Alternatively, a new Year 10 teacher could use this short project to review the outcomes and processes against the criteria, suggesting areas for development. This would form an initial assessment with a new group of pupils.

Example task

Teachers can change the words in italics so that the task can be made topical.

Amstead School has a brand-new all-weather sports pitch. The facilities include changing rooms and flood lighting. The school will use the facilities during the day but at weekends and evenings the facilities will be let to other organisations on a commercial basis.

The facilities are to be opened by a *famous person* on Saturday *date* at 2.30 pm. Other guests will include the town's mayor and *the main sponsor* of the facilities. The headteacher of the school will begin the opening by welcoming the guests and will then invite the *famous person* to cut the tape. The mayor will then be invited to thank the school for the facilities on behalf of the town. *The main sponsor* has also requested to speak at the opening. The headteacher will finish by inviting all the guests to a tea.

The headteacher has asked you to produce a programme for the official opening.

Extension task

Produce a spreadsheet to cost the tea.

Design grid (a)

Which part of the system? .....

Sources of information

Inputs	Processes	Outputs

Software packages I will use

Testing strategy

Test plan

Test	Result of test	Changes required

Design grid (b)

Which part of the system? .....

Sources of information

Inputs	**Processes**	**Outputs**

Software packages I will use

Testing strategy

To check the information is correct

To check the speakers' list

To check the layout

Test plan

Test	**Result of test**	**Changes required**
Are the details of event correct – time, date, location?		
Is the sequence of speakers in the right order?		

Project 2: Pupil self-assessment

Learning outcomes

Pupils maximise their chances of making progress during Key Stage 4 by taking greater responsibility for their own learning. This means knowing what they do well, what they need to do better and how their experience at Key Stage 3 has prepared them for the different but related challenges of Key Stage 4. In this project, pupils will explore how they can help themselves, and their peers, to assess how well they succeeded in a task. They will look at how clear, positive feedback can help them to improve their learning and performance. The project suggests a context in which the task can take place. This project helps develop the key skill of **Improving own learning and performance**.

Background to the project

This project outlines a sequence of lessons designed to help pupils help themselves in ICT. It introduces pupils to the assessment objectives for GCSE ICT in a way that gives them confidence by enabling them to recognise how much they know and can do. The timings are flexible to allow for variations in relation to the needs and experience of pupils.

It is anticipated that most pupils will have one hour allocated to ICT and that this project will cater for both pupils who are planning to continue ICT at GCSE level (or GNVQ or Diploma in Digital Applications: DIDA) as well as those pupils for whom this is their last experience of ICT as an examination subject.

The project builds upon work carried out in the *Progress into and through Year 9 case studies* (DfES 0227/2002) concentrating on the use of the system life cycle as an organisational tool and focusing pupils on peer and self-evaluation.

Resources

- examination board specification being taught
- Appendix 2.1: The context and task – working for Amstead
- Appendix 2.2: E-mail from Petra to Sam (1)
- Appendix 2.3: Pupil self-evaluation checklist
- Appendix 2.4: Teacher feedback form
- Appendix 2.5: E-mail from Petra to Sam (2) – extension task
- Appendix 2.6: E-mail from Petra to Sam (3) – extension task

Structure of the project

Much Key Stage 4 work in ICT is scenario-based. In this unit, the pupil is encouraged to play the role of a new employee, Sam, who receives instructions by e-mail from a supervisor, Petra. Teachers may wish to set this up on their school intranet, sending instructions and receiving work electronically.

Introduction	Pupils receive scenario and instructions about a computer-based task. The teacher leads the class in establishing criteria for success based on their Key Stage 3 work. Pupils identify the task and write down anything and everything that they need to do to complete the task.	1 hour
Design	Pupils sketch out plans for a logo to complete the task and decide on the software that they are planning to use to solve the problem. Pupils discuss their designs with a friend and react to any feedback by altering their plans. Pupils may have to research common business formats for business cards, headed notepaper and posters.	1 hour
Implementation	Using the selected software, pupils first create the three logos. They choose their favourite, giving reasons for that choice. They then design how their logo could be incorporated into a business card, a letterhead and a poster before embarking on the production phase.	2 hours
Evaluation	The completed documents are e-mailed back to the supervisor with a report on how the project went and the problems that were encountered and overcome.	1 hour
At this point we reach the end of the Year 9 element of this project. Pupils have practised working independently using the system life cycle. They have employed peer and self-assessment to solve a realistic, practical problem using a combination of ICT tools and techniques. Pupils will continue with this scenario in Year 10 using one or both of the extension tasks. In Year 10 the teacher will use the assessment criteria from the GCSE/GNVQ/DIDA specification to scaffold learning.		
Introduction	The teacher introduces a self-evaluation checklist similar to the one supplied in Appendix 2.3: Pupil self-evaluation checklist and also Appendix 2.4: Teacher feedback form, to suggest improvements and modifications to the work. Pupils work together to review their Year 9 work using the new checklist before beginning the extension to the project.	1 hour
Main body	Continuation tasks using Appendix 2.5 and/or Appendix 2.6. Focus on the coursework checklist to ensure assessment is built into what is essentially an event-driven task. Peer groupings should be used to support testing and evaluation stages.	1–3 hours
Plenary	Teacher and pupils share and discuss the experience of peer and self-assessment linked to the new assessment criteria.	1 hour

Managing the project in Year 9

To enable pupils to succeed, this activity needs to be planned very carefully. Pupils are not yet familiar with event-driven tasks (although as the on-screen tests develop this should be less of an issue) and they will need support to keep them on-task, particularly when sharing their work with other pupils. Teachers and teaching assistants will need to be clear about the levels of support that are appropriate for individual pupils to ensure that they continue to make progress. Teachers may wish to develop this project on their school intranet to make it truly interactive, with work being submitted to 'Petra' electronically. This would support the electronic portfolio that is a feature of the proposed DIDA.

Developing the project in Year 10

Pupils' images of themselves as learners, and their recognition of what they know and what they need to know, underpin progress in Years 10 and 11. The process of self-assessment can help prepare pupils for GCSE, since in Year 10 they will be expected to take greater responsibility for their own learning, to manage chosen areas of work, and to prioritise their efforts in relation to their pattern of achievement. By introducing pupils to the GCSE assessment objectives early in Year 10, teachers can involve pupils in identifying their personal targets, negotiating aspects of their learning and monitoring their own progress. It may also be possible to continue and extend the peer-group assessment featured in the project.

Appendix 2.1

The context and task – working for Amstead

Amstead Gaiety Theatre is planning to put on a new production of Gilbert and Sullivan's *The Gondoliers*. It is very important that the show is well attended as Lottery funding may be withdrawn from the theatre if the show is a flop. The Gaiety has been rebuilt recently after Amstead's North Pier was destroyed in last winter's storms. It now occupies new purpose-built premises right on the beach at Amstead. You are Sam Taylor, the newly appointed ICT manager. Your boss is Petra Hughes, the theatre's Business Manager.

The postal address for the theatre is:

Amstead Gaiety Theatre
South Promenade
Amstead
Amshire AM2 7TP

Telephone 0143 5683528

Fax 0143 5683529

E-mail address is amsteadgaiety@myaccount.com, though all staff have their own e-mail addresses.

Appendix 2.2

E-mail from Petra to Sam (1)

E-mail

Date: Tue, 17 Aug 2004 08:32:45

From: "Petra Hughes" <hughespetra@myaccount.com>

Subject: Welcome to Amstead

To: sam_tylr@myaccount.com

Hi Sam

Welcome to Amstead. I hope you like your new office and the computer. We have tried to get all of the software and hardware that you requested but please let me know if you need anything else.

As you know, we have a brand-new production of Gilbert and Sullivan's 'The Gondoliers' planned for August 2005. I want it to be the most successful show that the theatre has ever put on. Now we are in our new building, the old logo is not appropriate (it is a drawing of the old theatre on the pier). I want our new logo to suggest our sunny seaside location and give the impression that Amstead Gaiety Theatre has something for all the family. We get lots of foreign visitors, so keep the text down to a minimum.

I'd like to see two or three draft designs. Print them in black and white but indicate the colours you plan to use. Can you incorporate them into a letterhead, a business card and as the footer to a blank A4 poster? (Sally Dixon the receptionist often needs to put up notices quickly, especially as the plumbing in the ladies' toilets is still giving us problems!)

Regards

Petra

Using a word processor

Task	Timing	Life cycle
1 Summarise the problem – what have you been asked to do? Show this to your teacher before you continue.		Identify
2 What problems will you have to face? (How will you suggest the seaside location?) List them.		Analyse
3 Away from the computer, sketch two or three possible designs for your logo. Show your designs to a friend. Discuss whether they are effective in meeting Petra's needs. Decide what software you plan to use and say why you have chosen it.		Design
4 At the computer use your chosen software and produce your designs. (Remember that the logo has to be printed in at least three different sizes.) Show your finished logos to your friend. Ask them to suggest improvements. Incorporate suggestions into your work.		Implement/ test
5 Produce sample letterheads, business cards and blank posters to send to Petra. Tell her which one you prefer and why. What did you think about your choice of software? How long did this take?		Implement/ evaluate

Appendix 2.3

Pupil self-evaluation checklist

Name: _____

Design

A	Have I clearly identified the task?	
B	Have I said what the software needs to be able to do to complete the task?	
C	Have I said what type(s) of software could be used to do this?	
D	Have I said which software packages I can choose from?	
E	Have I said which one would be best to use and why?	
F	Have I said which software package I am going to use – and why?	
G	Have I included step-by-step plans showing how I am going to tackle the task?	
H	Have I shown what my solution looks like, including sketches?	

Implementation

I	Have I kept printouts to show how my work has developed?	
J	Have I written notes on my printouts showing any changes needed or clever ideas used?	
K	Does my final printout show how I have met the needs of the user?	

Testing

L	Have I said how I will test my solution?	
M	Have I said what I will do if it does not work (action plan)?	
N	Have I filled in a Test Plan sheet for each test printout?	

Evaluation

O	Have I explained how I met each of the user's needs?	
P	Have I described any problems I encountered and how I solved them in order to meet the user's needs?	
Q	Have I described how my chosen software coped in solving the problem?	

Appendix 2.4

Teacher feedback form

Pupil's name _____

These comments refer to the block of work that I have marked with the letter ____ in your work. The letter corresponds with the prompts on your pupil self-evaluation checklist. Please do not remove your original printout from the evidence and keep this advice attached to your work.

Comments:

Appendix 2.5

E-mail from Petra to Sam (2)

E-mail

Date: Fri, 20 Aug 2004 16:45:10

From: "Petra Hughes" <hughespetra@myaccount.com>

Subject: Mail merge

To: sam_tylr@myaccount.com

Hi Sam

Thank you for the logos. I agree with your choice of favourite. Please print your designs in colour to show to the theatre governors.

Now we need to start promoting the production. I want to write personally to all of the Friends of Amstead Gaiety Theatre who have said that they are interested in opera to let them know that the performance is taking place. We have all of their details on a database. You should be able to do a mail merge and filter it so that we only write to the opera lovers. (That should save us some money in postage!) Dates have been confirmed as 14th to 18th August 2005. Offer them reduced-price admission of £4. Now we have new software you may need to learn how to mail merge – another 2-hour task, I think.

Petra

Using mail merge

Task	Timing	Life cycle
1 Summarise the problem.		Identify
2 Write down what you need to do.		Analyse
3 Use your chosen letterhead and the graphic. Print a sample letter showing the merge fields. Print a sample merged letter as well.		Design Implement
4 Check that your merge has filtered so that you have produced the correct number of letters only. (After you have produced the mail merge do a screen print to show the correct number of letters.)		Test
5 Attach a paragraph to this printout explaining to the theatre management committee why doing a mail merge is a good way of solving this problem.		Evaluate

Appendix 2.6

E-mail from Petra to Sam (3)

E-mail

Date: Mon, 30 Aug 2004 09:45:45

From: "Petra Hughes" <hughespetra@myaccount.com>

Subject: Controlling the Exhibition

To: sam_tylr@myaccount.com

Hi Sam

Great job with the mail merge. The bookings are flooding in. Hopefully we should be well in profit although I still haven't found the orchestra. We'll deal with all that later.

I have just found out that they are sending us an ancient painted gondola from Venice as the centrepiece for a display. It is the real thing and we must keep it damp otherwise it will never float again when it gets back to the canal. It has to be kept warm (at least 20ºC but not over 40ºC) as well. It needs to be brightly lit so that the fluorescent decorations can be displayed at their best. We are going to display it in the conservatory (a bit like a greenhouse) and we will only need to use electric light if it gets cloudy. We won't want the lights on after the show is over at 10.00 pm.

I'm not sure that we can do this. I have heard of a program called Flowol that may be able to simulate this before we spend lots of money on sensors and activators. Can you check this out and let me know if it is feasible to control the environment in the conservatory?

Regards

Petra

Using Flowol

Task	Timing
1 Summarise the problem.	
2 What have you been asked to do?	
3 Investigate how Flowol can be used to model problems like this.	
4 Word-process a report back to Petra, including flow charts. Tell her whether you think they will be able to exhibit the gondola.	

Project 3: Understanding Key Stage 4 assessment

Learning outcomes

In this project, pupils will explore the marking criteria for their examination board specification and will reinterpret them into a form they can understand. They will also learn how to use feedback from others (peers and teachers) to plan the next steps in their work. This project will address the key skill of **Improving own learning and performance**.

Background to the project

Pupils often find it difficult to understand the marking criteria for Key Stage 4 project work and, in particular, what they are required to do to achieve higher marks.

This project aims to provide opportunities for pupils to develop the skill of interpreting assessment criteria into words which enable them to engage fully with the task and also to practise setting themselves challenging but achievable targets for progress to higher marks.

Pupils who have been taught sample teaching unit 8.5 *An ICT system: Integrated application to find solutions* (DfES 0222/2003) and *Progress into and through Year 9 case studies* (DfES 0227/2002) will have learned about the system life cycle and project management. They will have analysed a problem and attempted to design a solution. They will be familiar with what building a system involves. One of the key differences at Key Stage 4 is that they are expected to work more independently. More emphasis is placed on pupils developing their own systems and this means that they must be more autonomous in making the decisions which enable them to gain higher marks. This project aims to help provide some of the skills to support this increasing independence.

Resources

- examination board specification being taught
- appropriate examination board website
- Key Stage 3 Assessment for Learning materials
- Appendix 3.1a and Appendix 3.1b: Marking criteria for analysis

Structure of the project

Teachers plan activity	As a department, teachers work together to identify appropriate marking criteria to use for the initial activity at the start of Year 10. See Appendix 3.1a and Appendix 3.1b for examples. Teachers ensure that there is common understanding of the meaning of the marking criteria and collect examples of pieces of work which will enable them to model success to their pupils.	1 hour to plan
Classroom activity 1	Each pupil is provided with the marking criteria to be addressed. (Where appropriate, teachers will have reworded the criteria to suit the needs of the pupils without affecting the essence of what is required.) Pupils work in pairs to discuss and pick out key words from the criteria. The teacher leads a class discussion, highlighting the key words, which indicate what is required to achieve the marks available. They use examples of previous pupils' work to exemplify each standard (including examples of work that meet the standard as well as examples of work that do not). Pairs of pupils produce, in their own words, their own version of what is required.	1 hour
There should be a suitable period of time separating these two activities to allow completion of the first draft of work by pupils.		
Classroom activity 2	When pupils have completed their own first attempt at producing a piece of work to address the marking criteria, they work with their original partner and their own agreed criteria to assess progress towards achieving the marks available. Pupils give feedback to their partners on how to move forward to a higher mark. This session should end with a plenary in which the teacher takes feedback from pupils on the extent to which they have succeeded with the activity and identifies any issues which need to be addressed.	1 hour

Managing the project in Year 9

While the learning outcomes for this project are targeted at pupils, an important benefit will be the process of standardisation of marking across a team of teachers. Further, while specifications and assessment criteria may change over time, once teachers develop the skills necessary for this project, they will be able to apply them to any new specification. This work will contribute to greater cohesion of approach across the team and may stimulate other shared work.

Identifying a suitable assessment objective for the initial project is very important. Analysis forms an integral part of project development in Key Stage 4 specifications as well as being a key step within the ICT system life cycle. Pupils carry out their analysis in the very early stages of their project work, hence analysis is a good starting point.

The initial planning activity for teachers will vary depending on the marking scheme for the specification they use. Schools may need to seek advice from their own examination board before proceeding with the planning activity. Examination board websites and feedback the school has received about previous coursework submissions can provide further support.

Are there any identified weaknesses (from the pupils' Key Stage 3 work), which indicate an area of study that must be addressed first before other parts of the course can be attempted? Depending on the ability of the pupils in the group (both in terms of ICT and generally), are any of the criteria more accessible than others?

The department should collect work at a suitable level – either past work, made anonymous, or examples from the examination board website – for pupils to use in classroom activity 1. By discussing exemplar material, which has attained particular marks, pupils will learn what they must do to achieve those marks themselves.

Some pupils will need considerable help with the language used in the marking criteria, and in some cases this will need rewording before use.

Departments should consider the time delay between classroom activities 1 and 2. The most appropriate time for the project is the first four weeks of Year 10, but it could form a bridging task between Year 9 and Year 10 depending on the examination courses chosen.

Teachers will need to monitor pupils to avoid any pairs producing assessment criteria which are not compatible with the original criteria.

Developing the project in Year 10

There is considerable scope for development of this project but time may become a limiting factor. Breaking down criteria at different stages of a one- or two-year course could form a starter activity at different times during the year. Teachers may find it useful to use a pupil's own criteria to formulate curriculum targets to guide them towards the next stages of their work.

Appendix 3.1a

Marking criteria for analysis

The following example is based on the specification for OCR ICT B (1095/1995). Refer to the marking criteria of the appropriate specification for further details.

To gain 1 mark	Candidates will demonstrate a basic **working knowledge** of an **IT problem**, and **how to solve it**.	
	Problem	Wage slips – manual should be computerised
	Solve it	Look at different types of integrated software
		Mail merge
To gain 2 marks	Through **interview**, **research** and **investigation**, candidates will establish **what potential users want**.	
	Interview: what users want	Ask family and friends what information they would like to see on their wage slip
	Research	Look at as many wage slips as possible
	Investigation	Pick out the key fields that should be on all wage slips, e.g. name, address, pay number
To gain 3 marks	Candidates will identify what **data** will be **input**, what will be **stored** and what **output** the system will generate.	
	Data input	How, by whom and how checked?
	Stored	What medium, security?
	Output	Computer-generated wage slip
To gain 4 marks	Candidates will **explore a range** of **potential systems**, and **investigate possible solutions**.	
	Range	What else can mail merge be used for?
	Potential	Gas/electricity readings and bills
		Membership of clubs
		School reports, etc.
	Investigate possible solutions	Use Word/Excel/Access/Publisher
		Buy ready-made business software
		Have software specially written
		Training

To gain 5 marks	Candidates must **match** potential **solutions** to **project aims** and explore **ease of use** and **appropriateness**.	
	Match solutions and project aims	Word/Excel suitable for small family-type firm Some larger companies could use off-the-shelf software The largest (those with the largest workforce) would need bespoke software All three would provide accurate wage slips
	Appropriateness	All three are appropriate in the right setting
	Ease of use	All three would require some degree of training

Appendix 3.1b

Marking criteria for analysis

This example is based on the specification for OCR GCSE in Applied ICT (Double Award) (1494). Refer to the marking criteria of the appropriate specification for further details. The example relates to Assessment Unit 2: Business Systems Portfolio.

Pupils are asked to produce:

- a report of an investigation into two different organisations' use of ICT
- original documents for different business purposes
- an ICT system for a given situation for one of the organisations.

This must include coverage of marking criteria **a**, how and why the organisations use ICT, the hardware and application software used and how these meet the organisations' needs [8 marks].

Note There are also seven other criteria **b**–**h** but this example will focus on **a** alone.

A typical candidate at grades GG, FF, EE will:	**A typical candidate at grades DD, CC, BB will:**	**A typical candidate at grades BB, AA, A*A* will:**	**Mark**	**Max**
a1 Identify how the organisations use ICT, the information requirements of some systems and the hardware and application software used 0 1 2 3 4	**a2** Describe how the organisations use ICT, the information requirements of most major systems and the hardware and application software used 5 6	**a3** Explain why the organisations use ICT and how the hardware and application software used meet the organisations' needs and help them to communicate effectively 7 8		8

The further exemplification for these criteria is also provided as follows:

a1 Candidates will list and make brief comments on the organisations' use of ICT, information requirements, hardware and software. To gain 1 mark, candidates must give at least one use of ICT by each organisation, along with the information requirements and the hardware and application software for at least one system.

a2 Candidates will produce several sentences on each of the organisations' uses of ICT, and the information requirements, hardware and application software for most major systems. The quality and completeness of their descriptions will determine whether 5 or 6 marks are given.

a3 At this level candidates will be able to recognise the organisations' needs. They will provide cogent explanations why the organisations use ICT to meet these needs and the ICT systems used. Again, the quality and completeness of the explanations will determine the mark awarded.

In this example the modelling of previous pieces of work which achieved (or did not achieve) the specified mark would be particularly important. In addition, the key words relevant to the award of different marks would be highlighted as below.

A typical candidate at grades GG, FF, EE will:	A typical candidate at grades DD, CC, BB will:	A typical candidate at grades BB, AA, A*A* will:	Mark	Max
a1 Identify how the organisations use ICT, the information requirements of some systems and the hardware and application software used 0 1 2 3 4	**a2** Describe how the organisations use ICT, the information requirements of most major systems and the hardware and application software used 5 6	**a3** Explain why the organisations use ICT and how the hardware and application software used meet the organisations' needs and help them to communicate effectively 7 8		8

The exemplification of criteria must also be analysed to pick out key guiding words:

a1 Candidates will list and make brief comments on the organisations' use of ICT, information requirements, hardware and software. To gain 1 mark, candidates must give at least one use of ICT by each organisation, along with the information requirements and the hardware and application software for at least one system.

a2 Candidates will produce several sentences on each of the organisations' uses of ICT, and the information requirements, hardware and application software for most major systems. The quality and completeness of their descriptions will determine whether 5 or 6 marks are given.

a3 At this level candidates will be able to recognise the organisations' needs. They will provide cogent explanations why the organisations use ICT to meet these needs and the ICT systems used. Again, the quality and completeness of the explanations will determine the mark awarded.

Project 4: Focus on context

Learning outcomes

In this project, pupils will explore one assessment objective and the interpretation of their examination specification linked to scoping a problem. Examination boards have commented that, for some pupils, developing the problem with the chosen context in mind is a stumbling block to success at GCSE. ICT solutions may be developed in general rather than by referring to the needs of the specific user, and pupils may develop the data flow within one context. This project will address the key skill of **Problem solving**.

Background to the project

This project outlines a sequence of lessons to focus pupils on the importance of developing the context of the project before embarking on a long piece of coursework. The context would need to have a vocational route if an Applied GCSE is chosen. The project encourages pupils to explore their own experiences and to develop their ideas as a whole class and in subgroups.

Resources

- assessment objectives for Key Stage 4 specifications
- Appendix 4.1: Medical centre data flow

Structure of the project

Introduction	Pupils are introduced to one GCSE assessment objective and the importance of the words: **range of situations**, or **vocational contexts**. They produce an initial map of the types of ICT situations in a medical centre. The teacher models the possible data flow situations for the patient, and pupils begin to outline ICT solutions which could be developed.	1 hour
Main body of the project	Pupils work in groups to develop the data flow for the staff section of the practice. One member of each group moves to a new table to share ideas and refine the model. Groups feed back. Pupils use research to refine the plan and develop one possible ICT solution. Roster (modelling), appointment database, poster/notice for staff or patient notice board are possible ideas.	1–2 hours

Conclusion	As a class, pupils reflect on their learning experience. They discuss the different and varied solutions, and consider the types of project which could address the same assessment objectives.	1 hour

Developing the project in Year 10

This project could be used at the start of Year 10, before coursework projects are provided by the examination boards, or as an introduction to potential coursework projects. Used in Year 9, it could provide the stimulus for pupils to use the summer break to consider the in-depth projects they would like to undertake in Key Stage 4.

The following assessment objectives have been chosen to illustrate the change from Key Stage 3 work, where the contexts are undertaken by the whole class:

- GCSE ICT: AO1 – apply knowledge, skills and understanding of ICT to a range of situations
- GCSE Applied ICT: AO1 – apply ICT purposefully and effectively in vocational contexts.

The starter task is used to develop, illustrate and reinforce the importance of ensuring pupils tailor the ICT tasks. When modelling the first data flow plan it is important to involve the class in seeing the links between information and the possible systems which will be developed, asking questions as the plan develops.

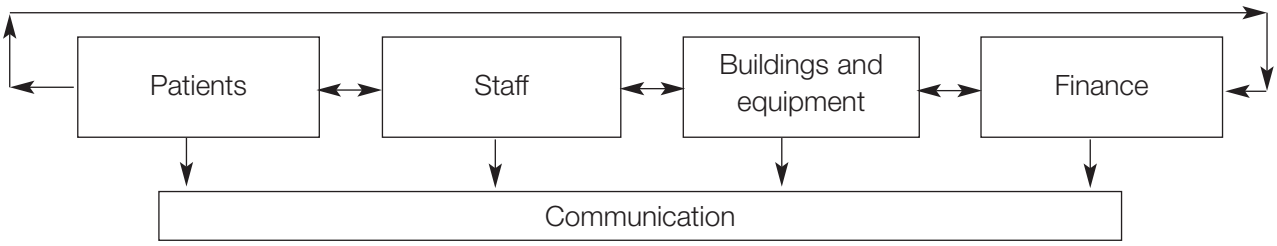
Begin with the context: the practice manager of a medical centre wants a clear picture of the responsibilities in the centre. Identify the key elements (Flow 1). Model the elements for the patients' section (Flow 2) against the question: What happens when you go to the doctor? Ask pupils to develop the next section: staff. By working in groups, and then moving tables to share other solutions, they will see how different teams develop very different ways of illustrating the various actions and systems. Use the example (Flow 3) to question groups about their solutions. Depending on the time available and the ability of the groups, a range of ICT solutions could be developed including a simple roster for staff holidays and days off using a spreadsheet, a database for appointments or a patient notice or newsletter.

Use the example to reflect on the wide range of ICT systems required by the practice and to consider other projects that pupils could develop for coursework, emphasising the requirement for some specifications to use a vocational context.

Appendix 4.1

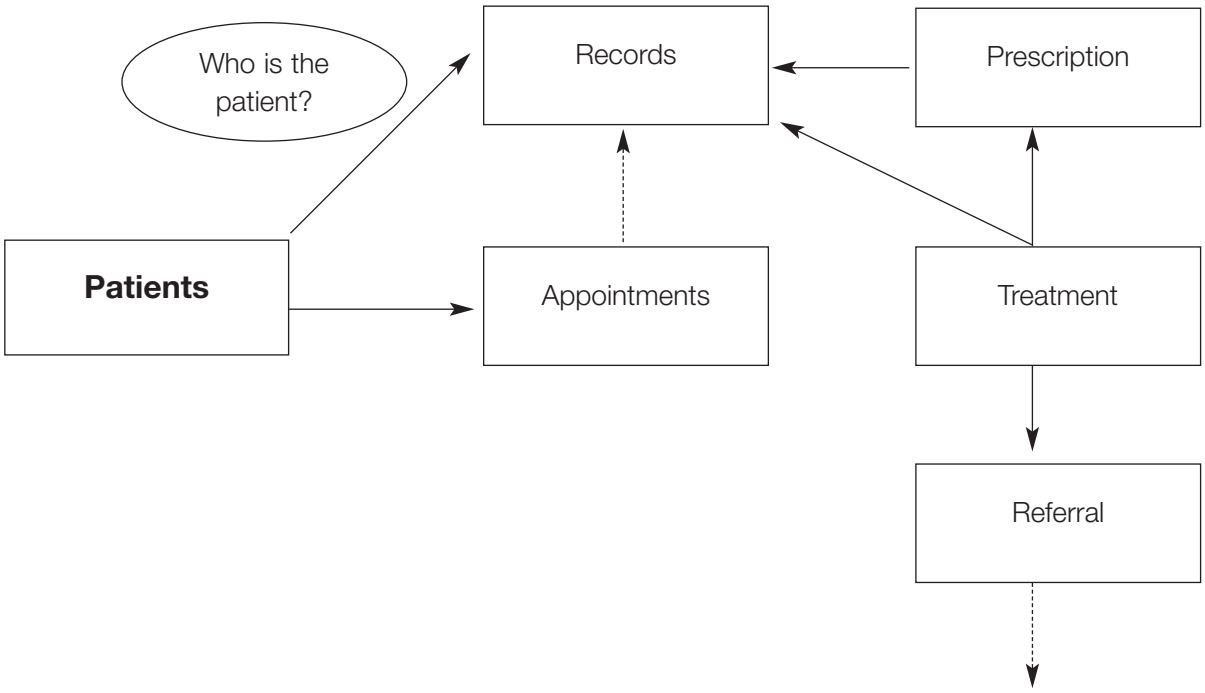
Medical centre data flow

Flow 1: responsibilities in the medical centre



Flow 2: patients' section

What happens when you go to the doctor?



Flow 3: staff section