National Unit specification

General information

Unit title: Computing: Project (SCQF level 6)

Unit code: H6S7 46

Superclass:	CB
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Unit purpose

The purpose of this Unit is to allow learners to work collaboratively within a group to plan, design, implement, test and evaluate a computing project. Learners will be required to produce a project in response to a project brief. The brief can be formulated by negotiation between learners and their assessor. The project should be completed by a project team working together, but with individual learners having defined areas of responsibility. The planning, design, implementation and testing stages should be carried out collaboratively; however each learner must complete an individual evaluation of the project as a whole from inception to completion.

The Unit is suitable for learners studying computing subjects such as web design, networking, technical support, multimedia, game design or software development and provides the opportunity for them to demonstrate the knowledge and skills they have accumulated. It should give learners the opportunity to further develop key skills in planning, decision making, working with others, communications, implementation, problem solving, time management, testing and evaluation.

This Unit is a mandatory Unit within the National Certificate in Computing with Digital Media at SCQF level 6.

Outcomes

On successful completion of the Unit the learner will be able to:

1   Contribute to the creation of a plan for a computing project from a project brief.
2   Contribute to the creation of a design document for the project.
3   Contribute to the implementation of a project plan.
4   Evaluate a project.

National Unit specification: General information (cont)

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Credit points and level

2 National Unit credits at SCQF level 6: (12 SCQF credit points at SCQF level 6).

Recommended entry to the Unit

Entry is at the discretion of the centre, although learners will require to have sufficient skills and knowledge in a specific area of computing on which the project can be carried out.

Core Skills

Achievement of this Unit gives automatic certification of the following:

Complete Core Skill   Working with Others at SCQF level 4
                             Problem Solving at SCQF level 6

Core Skill component   None

There are also opportunities to develop aspects of Core Skills which are highlighted in the Support Notes of the Unit Specifications for this Course.

Context for delivery

If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes. It is also expected that it be undertaken in the later part of the academic year, so that learners have successfully completed a number of Units from within the Group Award and will have gained suitable knowledge, skills, experience and confidence with which to carry out the requirements effectively. The project should be based on the content of the Units within the Group Award.

The Assessment Support Pack (ASP) for this Unit provides assessment and marking guidelines that exemplify the national standard for achievement. It is a valid, reliable and practicable assessment. Centres wishing to develop their own assessments should refer to the ASP to ensure a comparable standard. A list of existing ASPs is available to download from SQA's website **(http://www.sqa.org.uk/sqa/46233.2769.html)**.

Equality and inclusion

This Unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website **www.sqa.org.uk/assessmentarrangements**.

National Unit specification: Statement of standards

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Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

Outcome 1

Contribute to the creation of a plan for a computing project from a project brief.

Performance Criteria

In collaboration with team members create a project plan which includes all of the following:

(a)   Create a specification for a suitable project based on a project brief.
(b)   Create an action plan with key tasks and milestones identified with timescales.
(c)   Identify the resources required to complete the project.
(d)   Assign roles and responsibilities to each team member.

Outcome 2

Contribute to the creation of a design document for the project.

Performance Criteria

In collaboration with team members create a design document which includes all of the following:

(a)   Create appropriate design diagrams and/or written designs.
(b)   Identify an appropriate test strategy.
(c)   Produce a test plan.

Outcome 3

Contribute to the implementation of a project plan.

Performance Criteria

In collaboration with team members:

(a)   Carry out the key tasks identified in the project plan.
(b)   Acquire and use the resources appropriately in accordance with the project plan.
(c)   Review and maintain progress through regular team meeting discussions.
(d)   Maintain a concise record of the implementation process.
(e)   Carry out the test plan.
(f)   Rectify errors in the implementation and track any changes.

National Unit specification: Statement of standards (cont)

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Outcome 4

Evaluate a project.

Performance Criteria

Each member of the team should produce an individual evaluation report to:

(a)   Identify strengths and areas for improvement in the project plan.
(b)   Identify strengths and areas for improvement in the implementation of the project.
(c)   Review each team member's contribution to the project, including their own.
(d)   Identify strengths and weaknesses of the team as a whole in carrying out the project.
(e)   Identify action points to improve the planning and implementation of future projects.

Evidence Requirements for this Unit

Assessors should use their professional judgement, subject knowledge and experience, and understanding of their learners to determine the most appropriate ways to generate evidence and the conditions and contexts in which they are used.

The evidence for this Unit may be written or oral or a combination of these. Evidence may be captured, stored and presented in a range of media (including audio and video) and formats (analogue and digital). Particular consideration should be given to digital formats and the use of multimedia.

Evidence is required to demonstrate that learners have achieved all Outcomes and Performance Criteria. Learners will be assessed on how they completed their individual tasks in the planning, design, implementation, testing and evaluation of a team based project. Each learner must demonstrate their contribution to each of the four stages and their ability to work effectively as part of a team. The assessor should also judge the success of the project as a whole and how well the final product was realised. However it is not mandatory that everything that they set out to do was achieved, but anything they fail to do must be explained in the evaluation as to why those aims were not achieved. At least 75% of the aims set out in the project plan should be achieved by the team in order for them to successfully pass the Unit.

The first three stages of the project are all team based and therefore the team need only submit a single copy of the documents to be assessed for all members of the team. The final evaluation stage is individual and therefore each learners must submit their own report.

Each group of learners should submit the following for assessment:

Outcome 1

♦   Project plan, which must include specification, tasks, milestones and timescale with details of the roles and responsibilities assigned to individual learners.
♦   Record of all initial team meetings, which should demonstrate individual contributions to discussions at the planning stage.

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Outcome 2

♦ Design document, which should include design diagrams and/or written designs, which will depend largely on nature of the project.
♦ Test strategy and test plan.
♦ Record of all team meetings, which should demonstrate individual contributions to discussions at the design stage.

Outcome 3

♦ Evidence of the implementation of the project plan. This will depend on the nature of the project.
♦ Completed test plan and record of any changes made.
♦ Record of all team meetings held during implementation, which should demonstrate individual contributions to the decision making process at the implementation stage.
♦ A concise record of all activity, by all members during the implementation stage. The record should show dates and be updated on at least a weekly basis.

Outcome 4

♦ Individual evaluation reports.

The project should be carried out under open-book conditions; however evidence must be produced under controlled conditions whenever possible and where appropriate. The amount of control will vary from context to context. For example, evidence could be generated through the use of web blog, written over an extended period of time at varying locations, which would not permit such controlled conditions. However, in every case, the conditions of assessment must be controlled to some extent. Where the amount of control is low, the amount of authentication should rise. It is not acceptable to produce evidence in lightly controlled conditions with little authentication.

Authentication may take various forms including, but not limited to, oral questioning and plagiarism checks. Some forms of evidence generation (such as video recordings) have intrinsic authentication and would require no further means of verification. Where evidence is not generated under closely controlled conditions (for example, out of class) then a statement of authenticity should be provided by the learners to verify the work as their own, and also state any necessary sources and permissions. Any media assets used in the project that are not original work must show compliance with copyright law.

Evidence of practical competence may be produced over an extended period of time, notwithstanding any Performance Criteria relating to duration or time. Consideration should be given to the use of e-portfolios for the storage and presentation of evidence of practical and cognitive competence.

Whenever possible, evidence should be a naturally occurring by-product of teaching and learning. However, it must be produced by the learners without assistance. Authentication must be used where this is uncertain.

National Unit Support Notes

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Unit Support Notes are offered as guidance and are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 80 hours.

Guidance on the content and context for this Unit

This Unit is a mandatory Unit within the NC in Computing with Digital Media at SCQF level 6. It is intended to give learners the opportunity to use skills, knowledge and understanding developed through the successful completion of the other Units within the award. The project should be based on the content of the Units within the award and should reflect the particular emphasis individual centres have placed on the award, by their selection of optional Units. The brief for the project can be created by a negotiation between the assessor and the learners, but the assessor must ensure it meets the requirements of the Unit.

It is recommended that this Unit would be delivered towards the end of a programme of study, when learners are in a position to demonstrate the knowledge and skills they have accumulated over this course of study.

The nature of the project will depend on the particular area of computing chosen by the assessor or centre and this can be subject to negotiation with the learners. It may be that the project is to create a website, computer game, software application or an interactive multimedia application. If the centre has decided on a hardware based project, it could be that the project is to setup and configure a small client server local area network or it could involve building a personal computer from parts, including selecting and acquiring the components needed. In all these examples the project brief should state that there is a client for the finished product. This client could be a company or individual; preferably a real life client if possible.

The project brief, which can be provided by the assessor, but may also be subject to negotiation with the learners, should include:

♦   The area of computing on which the project will focus.
♦   A realistic scenario, including who the intended client is for the outputs of the project.
♦   A timescale for completion of the project.

In addition the brief should offer sufficient flexibility to allow each group of learners to devise their own unique response to it.

National Unit Support Notes (cont)

Unit title: Computing: Project (SCQF level 6)

The assessor should ensure that the specification produced by the learners, based on the project brief, will:

♦   allow learners to perform non-routine tasks.
♦   Contain complex elements suitable for SCQF level 6.
♦   Provide learners with the opportunity to demonstrate a range of knowledge and skills from other Units in the Group Award at SCQF level 6.
♦   Provide the opportunity to produce a suitable solution to the project brief.
♦   Provide learner groups with a realistic chance of completion within the timescale.

Learners who achieve the NC in Computing with Digital Media award at SCQF level 6 by successfully passing this Unit, could consider progressing to the HNC Computing award. They could also consider the HNC/HND awards in Computer Games Development, Information Technology, Multimedia Computing: Web Development and the HND awards in Technical Support, Software Development, Computing: Networking and Multimedia Computing. This may depend on the particular emphasis individual centres have placed on the award, by their selection of optional Units.

Guidance on approaches to delivery of this Unit

It is expected that by timetabling this Unit for delivery in the later part of the academic year, learners will have gained suitable knowledge, skills, experience and confidence with which to carry out this Unit effectively. The delivery of this Unit is designed to give learners the opportunity to use the skills, knowledge and understanding, they have acquired through the other Units on the NC in Computing with Digital Media at SCQF level 6; the Unit should not be concerned with re-teaching other Unit content.

The Unit involves learners working as part of a team and it is recommended that in the first instance learners are allowed to choose their own team members. Teams of more than four members are not recommended. Teams should also negotiate the roles and responsibilities of each team member by themselves, including choosing someone to lead the team. The assessor can step in and give guidance if required, but this should be avoided if possible.

Learners will find it helpful in understanding how they might approach this Unit if they are given realistic examples of acceptable and achievable computing projects.

Acceptable/achievable projects will be those that:

♦   contain complex elements in the planning, design, implementation and evaluation.
♦   contain a controllable plan and/or a manageable set of resources.
♦   combine a manageable range of knowledge and skills from other Units.
♦   encourage the learners to perform non-routine tasks.

Unacceptable/unachievable projects will be those that:

♦   have very basic planning, design, implementation and evaluation.
♦   have an over complicated plan/set of resources.
♦   replicate the Evidence Requirements for another Unit.

National Unit Support Notes (cont)

Unit title: Computing: Project (SCQF level 6)

Centres will need to consider resource/facility/staff issues when timetabling this Unit and this may require a well-defined project brief that provides learners with realistic opportunities for success.

Project plans by definition have phases with start and end dates. Beyond these criteria, it may not be suitable for centres to structure this Unit too rigidly.

Guidance on approaches to assessment of this Unit

This Unit involves learners working as part of a team to plan, design, implement, test and evaluate a computing project. Learners should be assessed on their individual contribution to a team project based on a project brief. Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

The project should be carried out under open-book, but controlled conditions whenever possible and where appropriate. The amount of control will vary depending on the nature of the project and the stage of the project the team are working on.

Assessment evidence is required at all stages and Outcomes. It must be documented and recorded electronically or in written/printed form, however it is encouraged to look at alternative approaches making use of modern technology such as web blog, video blog, pod casts and social media. Learners may want to make use of project planning software to create their action plan for Outcome 1. For Outcome 3, activity records could consist of individual logs for each team member or a single log for the whole team showing how every member contributed.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

Holistic assessment of the project is recommended. Assessors could use a checklist to evaluate how well individual learners completed their own tasks, how well they adhered to agreed roles and responsibilities, managed time and delivered the requirements of the project brief. Learners should also be assessed on how well they worked with others - their communication, collaboration and problem solving skills, and their overall contribution to the effectiveness of the team.

The project brief can be set by the assessor or can be created via an assessor led negotiation between the assessor and the learners. The assessor must ensure it meets the requirements and standards required by the Unit and is appropriate based on the skills and knowledge that the learners have acquired via the other Units in the NC in Computing with Digital Media award at SCQF level 6. It is acceptable for the assessor to devise multiple project briefs for the teams to choose from, so that different teams within the same class could carry out very different projects. This would depend very much on the facilities and resources available at the centre and the expertise of the Unit assessor.

National Unit Support Notes (cont)

Unit title: Computing: Project (SCQF level 6)

To ensure that teams provide a structured and achievable plan, it is recommended that they successfully complete Outcome 1 before being allowed to progress to the design stage in Outcome 2. It is also recommended that they complete the design stage in Outcome 2 before progressing to the implementation stage in Outcome 3. Collaborative discussion between the assessor and the project teams during the early stages of the project can influence the success of the project in the later stages.

Evidence for Outcomes 2 and 3 of the project will depend on its nature.

If the project is software or multimedia based, then suitable evidence would be flowcharts, storyboards, concept art, media catalogues, character bibles, etc. If the project is on networking then evidence could be a network diagram showing network topology and layout. If the project is hardware based then evidence could be a list of parts needed with various suppliers and costs.

If the project is based on web design, multimedia, game design or software development a copy of the finished product on appropriate media would be sufficient or a URL to where it is published online. If the project is networking or technical support in nature, evidence may be in the form of a demonstration of the final product to the assessor.

Learners should be given guidance regarding acceptable use of equipment in the course of producing the evidence and operate within the parameters of centre policies and health and safety procedures.

Opportunities for e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at **www.sqa.org.uk/e-assessment**.

Opportunities for developing Core and other essential skills

In this Unit, the project will provide opportunities for learners to develop Core Skills in *Problem Solving, Communication, Information and Communication Technology (ICT)* and *Working with Others*.

The project will also provide opportunities for learners to develop skills in planning, decision making, implementation, time management, testing, evaluation, enterprise, employability and citizenship. This will depend on the nature of the project chosen and the level of realism, for example there may be a real client who they are producing the product for.

National Unit Support Notes (cont)

Unit title: Computing: Project (SCQF level 6)

This Unit has the Core Skill of Working with Others and Problem Solving embedded in it, so when candidates achieve this Unit their Core Skills profile will be updated to show that they have achieved Working with Others at SCQF level 4 and Problem Solving at SCQF Level 6.

History of changes to Unit

Version	Description of change	Date

General information for learners

Unit title: Computing: Project (SCQF level 6)

This section will help you decide whether this is the Unit for you by explaining what the Unit is about, what you should know or be able to do before you start, what you will need to do during the Unit and opportunities for further learning and employment.

The purpose of this Unit is to allow you to work collaboratively within a team to plan, implement, test and evaluate a computing project. As such you will need to form a team, ideally consisting of three to four members. Your team will be required to produce a project in response to a project brief. The project brief can be created by negotiation with your instructor. The project will be completed by your project team working collaboratively together, but you will have defined areas of responsibility. The planning, design, implementation and testing stages should be carried out collaboratively by your team; however each team member must complete an individual evaluation of the project as a whole from beginning to end.

The Unit is suitable if you are studying computing subjects such as web design, networking, technical support, multimedia, game design or software development, and gives you the opportunity to demonstrate the knowledge and skills you have accumulated. It will also provide the opportunity to further develop key skills in planning, decision making, working with others, communications, implementation, problem solving, time management, testing and evaluation.

Over the course of the project you will work collaboratively within your team through three stages (planning, design and implementation) and individually in a final evaluation stage. It is important that you contribute to each stage and that you record evidence of what you contributed at each stage.

In the first stage your team must produce a plan based on a project brief. The plan will include a proposal, action plan with key tasks and timescales, list of resources required and a list of roles and responsibilities for each team member. It is important that you take part in the decision making process at this stage.

In the second stage your team must produce a design document for your project. The document may include written designs and/or design diagrams. This will depend largely on the area of computing that the project is based on. If the project is software or multimedia based, then suitable approaches would be flowcharts, storyboards, concept art, media catalogues, character bibles, etc. If it is a networking project an example would be a network diagram showing network topology and layout. If the project is hardware based, an example would be a list of parts needed with various suppliers and costs. As part of the design stage a suitable testing strategy must be selected and a test plan created.

In the third stage your team will be required to carry out the implementation of the project, by each team member following the project plan and carrying out their key tasks and responsibilities. The team will also be required to carry out testing of the product at this stage, with all results being recorded. You will need to rectify errors found at this stage and all resulting changes must be recorded. Team meetings will form an important part of the third stage, to make sure that everybody in the team is on track and meeting the deadlines set.

General information for learners (cont)

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In the final stage you will be required to individually evaluate the strengths and weaknesses of your team as a whole and the individuals within the team, including yourself. You will also be required to identify ways you could improve the process in the future.