



Higher National Project-based Graded unit Specification

General Information

This Graded unit has been validated as part of the HND Computer Games Development. Centres are required to develop a project-based assessment in accordance with this validated specification.

Graded unit title: Computer Games Development: Graded unit 2 (SCQF level 8)

Graded unit code: HH3N 35

Type of Project: Practical Assignment

Publication date: July 2018

Source: Scottish Qualifications Authority

Version: 03

Graded unit purpose

This Graded unit is designed to provide evidence that the learner has achieved the following principal aims of the HND Computer Games Development:

- ◆ To develop a range of specialist skills in computer games development.
- ◆ To prepare learners for employment in the games industry.
- ◆ To prepare learners for progression to further study in Games Programming, Games Design and Development, 3D Computer Arts/Modelling, or any other related discipline.
- ◆ To conduct independent project work involving the integration and application of a variety of skills within a determined time scale.
- ◆ To develop the Core Skill of *Problem Solving*.

Credit points and level

2 Higher National unit credits at SCQF level 8: (16 SCQF credit points at SCQF level 8)

Higher National Project-based Graded unit Specification: General Information (cont)

Recommended entry to the Graded unit

It is recommended that the learner should have completed or be in the process of completing the following units relating to the above principal aims prior to undertaking this Graded unit:

F86A 35	<i>Games Development: Object Oriented Programming</i>
DE2N 35	<i>3D Modelling and Animation</i>
HH3H 34	<i>Computer Programming: Applied Mathematics</i>
HH3L 35	<i>Computer Programming: Applied Mathematics</i>

And at least one of:

HH3D 35	<i>Artificial Intelligence for Computer Games</i>
F86H 35	<i>Game Physics</i>
HH3E 35	<i>Game Customisation and Scripting</i>
HF3D 35	<i>Designing and Developing an Interactive Media Product</i>

Core Skills

Achievement of this Unit gives automatic certification of the following:

Complete Core Skill Problem Solving at SCQF level 6

Core Skill component None

Opportunities to develop aspects of Core Skills are highlighted in the Support Notes for this Unit specification.

Assessment Support Pack

The Assessment Support Pack for this unit provides assessment and marking guidelines that exemplify the national standard for achievement. It is a valid, reliable and practicable instrument of assessment. Centres wishing to develop their own assessments should refer to the Assessment Support Pack to ensure a comparable standard. Assessment Support Packs are available on SQA's secure website.

Equality and inclusion

This Graded unit 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

Higher National Project-based Graded unit Specification: Designing the project and assessing learners

Graded unit title: Computer Games Development: Graded unit 2
(SCQF level 8)

Assessment

This Graded unit will be assessed by the use of a project-based practical assignment developed by centres. The project should provide the learner with the opportunity to produce evidence that demonstrates she/he has met the aims of this Graded unit.

The project undertaken by the learner must be a complex task which involves:

- ◆ variables which are complex or unfamiliar
- ◆ relationships which need to be clarified
- ◆ a context which may be unfamiliar to the learner

The project must require the learner to:

- ◆ interpret the needs of the project from the brief
- ◆ gather information to plan and develop the project
- ◆ decide upon and develop a design approach
- ◆ carry out the development
- ◆ test the product
- ◆ evaluate the product and process
- ◆ evaluate their own performance

This project requires the learner to **work alone** on the **development of a computer game**. Any type of computer-based game is acceptable but it must clearly be a game (such as a platform, action, role play, virtual world, quiz or strategy game). The game's length and complexity should be consistent with the SCQF level of this unit (level 8) and appropriate for a single person solution. The solution should be sufficiently large and complex to generate the required evidence (see Evidence Requirements).

All assignments must present an approximately **equal level of demand**, irrespective of the technologies involved. It is not acceptable to produce 'complex' games that are largely derived from automated software. Conversely, it may be acceptable to create a 'simple' game that was generated using complex tools and technologies.

The assessment exemplar for this unit provides assessment and marking guidelines that exemplify the national standard for achievement. It is a valid, reliable and practicable instrument of assessment. Centres wishing to develop their own assessments should refer to the Assessment Support Pack to ensure a comparable standard. Assessment exemplars are available on SQA's secure website.

Higher National Project-based Graded unit Specification: Designing the project and assessing learners (cont)

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Conditions of assessment

The learner should be given a date for completion of the project. However, the instructions for the project should be distributed to allow the learner sufficient time to assimilate the details and carry out the project. During the time between the distribution of the project instructions and the completion date, assessors may answer questions and provide clarification, guidance and reasonable assistance.

Reasonable assistance is the term used by SQA to describe the difference between providing learners with some direction to generate the required evidence for assessment and providing too much support, which would compromise the integrity of the assessment. Reasonable assistance is part of all learning and teaching processes. In relation to the assessment of Higher National Project-based Graded Units, assessors may provide advice, clarification, and guidance during the time between the distribution of the project instructions and the completion date, ie at each stage of the project.

Learners are required to **work alone** on this assignment. Each learner is required to carry out all of the stages in the software development process (specification, design, implementation, testing and delivery).

Remediation allows an assessor to clarify learner responses, either by requiring a written amendment or by oral questioning, where there is a minor shortfall or omission in evidence requirements. In either case, such instances must be formally noted by the assessor, either in writing or recording, and be made available to the internal and external verifier. In relation to Higher National Project-based Graded Units, learners must be given the opportunity for remediation at each stage of the project.

The evidence for a Higher National Project-based Graded Unit is generated over time and involves three distinct stages, each of which has to be achieved before the next is undertaken. This means that any re-assessment of stages must be undertaken before proceeding to the next stage. The overall grade is derived from the total number of marks across *all* sections, and should reflect the ability of the learner to work autonomously and the amount of support required. In relation to Higher National Project-based Graded Units, learners who have failed any stage of the project and have been unable to provide the necessary evidence through remediation must be given the opportunity for re-assessment of that stage.

The practical assignment will be based on the development of a solution for a real client or on a scenario supplied by the centre. If the method selected by a centre is a scenario given to a number of learners, then the centre must ensure the originality and uniqueness of each learner submission, through a formal authentication procedure.

The assessment task must require the learner to:

- ◆ analyse the task and decide on a course of action for undertaking the project.
- ◆ identify the requirements for the project.
- ◆ plan the solution for the project assignment.

Higher National Project-based Graded unit Specification: Designing the project and assessing learners (cont)

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- ◆ organise work through to project completion.
- ◆ develop the product to meet the solution.
- ◆ track and document work undertaken through to project completion.
- ◆ reflect on what has been done and draw conclusions for the future.
- ◆ produce an evaluation with critical analysis to cover the product that has been produced and an individual reflective analysis of their activities.
- ◆ produce evidence of meeting the aims which this Group Award Graded unit has been designed to cover.

It is recommended that a project brief/scenario is given out to each learner prior to starting this unit to allow time to assimilate the details and requirements of the assessment. It may be necessary for the assessor to role play in this assessment, for example as a client or supervisor.

The project brief/scenario will require each learner to produce a fully functional computer game using direct programming in an object oriented environment. The game should incorporate at least one 3D aspect. This could take the form of an imported 3D model or a 3D introduction to the game. It should also include some form of audio. Any assets that are not original work must show compliance with copyright law.

The project brief/scenario should offer sufficient flexibility to allow each learner to devise their own unique response to the assignment. The game may take the form of a platformer with more than one level, a quiz, a first person shooter, a strategy game or any other suitable genre. The project brief should give some guidance as to appropriate delivery platforms such as console, mobile or PC.

There should be clear guidance to the learner on submission dates for each of the three stages of the project and a detailed marking scheme based on the minimum Evidence Requirements and Grade Related Criteria within this specification.

Centres must take reasonable steps to ensure that the project is the work of the learners. For example, centres may wish to informally question learners, at various stages, on their knowledge and understanding of the project on which they have embarked. Centres should ensure that where research is carried out in other establishments, or under the supervision of others, that the learner does not receive undue assistance.

If a learner is found to have plagiarised, or to have gained an unfair advantage by other means, the centre should have procedures for dealing with this, including the authority to deem that the learner has failed the assessment. Learners should provide references in the form of footnotes and/or bibliography for any materials used and/or accessed that are not their own.

Higher National Project-based Graded unit Specification: Designing the project and assessing learners (cont)

Graded unit title: Computer Games Development: Graded unit 2
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Evidence Requirements for this Graded unit

The project undertaken by learners will consist of three stages: planning; developing; and evaluating. The following table specifies the minimum evidence required to pass each stage.

Project stage	Minimum Evidence Requirements	% Mark Allocation
Stage 1 — Planning	<ol style="list-style-type: none"> 1 Project proposal 2 Definition of project requirements 3 Project plan 	20%
	The learner must achieve all of the minimum evidence specified above in order to pass the Planning stage.	
Stage 2 — Developing	<ol style="list-style-type: none"> 4 Design documentation 5 Functional computer game 6 Source code 7 Program documentation 8 Test documentation 	60%
	The learner must achieve all of the minimum evidence specified above in order to pass the Developing stage.	
Stage 3 — Evaluating	<ol style="list-style-type: none"> 9 Evaluation Report to include: <ul style="list-style-type: none"> ◆ An outline of the assignment ◆ An assessment of the strengths and weaknesses of the solution ◆ Effectiveness of the development approach ◆ Effectiveness of the process ◆ Recommendations for improvements in the process and the product 	20%
	The learner must achieve all of the minimum evidence specified above in order to pass the Developing stage.	

Higher National Project-based Graded unit Specification: Designing the project and assessing learners (cont)

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Assessing and grading learners

The overall project will be marked out of **100**. Only whole marks should be used.

The percentage of marks allocated to each stage of the project is outlined in the **Evidence Requirements**.

It is a requirement that learners must meet the minimum *Evidence Requirements* for the *Planning* stage *before progressing to the Developing stage before progressing to the Evaluating* stage. Learners may produce evidence over and above that specified in the minimum *Evidence Requirements* and deserve more than half the available marks for that stage. Assessors should use the Grade Related Criteria outlined below to judge learner performance.

Learners are required to work independently to meet the *Evidence Requirements* of the Graded unit. At the same time, learners need appropriate support. SQA uses the term reasonable assistance to describe the balance between supporting learners in their project and not providing too much assistance.

At the end of *each* stage there should be opportunities for remediation and re-assessment of learners for that particular stage. This includes the final *Evaluation* stage. Any re-assessment should be carried out in line with the centre's own assessment policy.

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Grade Related Criteria	
Grade A	Grade C
<p>Is a seamless, coherent piece of work which:</p> <ul style="list-style-type: none"> ◆ has extensive evidence for all three stages of the project produced to a high standard, and is quite clearly inter-related ◆ demonstrates an accurate and insightful interpretation of the project brief ◆ is the product of successful project management of all tasks associated with the project brief ◆ is clear and well-structured throughout and the language used is of a uniformly high standard in terms of level, accuracy and technical content ◆ effectively consolidates and integrates the required knowledge and skills ◆ demonstrates the learner's ability to work autonomously with minimum support or revision within the allocated timescales ◆ demonstrates a high degree of self-awareness of their strengths and weaknesses. 	<p>Is a co-ordinated piece of work which:</p> <ul style="list-style-type: none"> ◆ has sufficient evidence for all three stages of the project and is produced overall to an adequate standard ◆ demonstrates an acceptable interpretation of the project brief ◆ shows a degree of project management of most tasks associated with the project brief ◆ is satisfactorily structured and the language used is adequate in terms of level, accuracy and technical content ◆ consolidates and integrates knowledge and skills but this may lack some continuity and consistency ◆ demonstrates learner's ability to work with limited support and occasional revision ◆ demonstrates limited self-awareness of their strengths and weaknesses.

The above table defines the criteria for achieving grade A and grade C; grade B is interpolated between these grades.

The Grade Related Criteria (GRC) should be applied to the Evidence Requirements **holistically** (not automatically). Some criteria will be more applicable to one (or more) stage than another.

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The criteria should be applied to the evidence for each stage to derive a mark for that stage. Progression from stage to stage depends on the learner passing each stage (achieving a mark of at least 50%).

All of the Grade Related Criteria must be included in the marking instructions. However, some criteria are more significant than others. The order of the criteria in the table broadly represents the significance of each criterion for the purposes of marking (most significant first).

The Support Notes provide further details and examples of how the Grade Related Criteria can be used to grade (mark) learners' evidence.

A specific approach to marking, using this design, is provided in each Assessment Support Pack.

The marks allocated to each stage will then be aggregated to arrive at an overall mark for the project. Assessors will then assign an overall grade to the learner for this Graded unit based on the following grade boundaries.

A = 70%–100%
B = 60%–69%
C = 50%–59%

Any learner who has failed their graded unit or wishes to upgrade their award must be given a re-assessment opportunity, or in exceptional circumstances, two re-assessment opportunities. In the case of project-based graded units, this must be done using a substantially different project.

The final grading given must reflect the quality of the learner's evidence at the time of the completion of the graded unit. Learners must be awarded the highest grade achieved — whether through first submission or through any re-assessment, remediation, and/or reasonable assistance provided.

These grade boundaries are fixed and should **not** be amended.

Higher National Project-based Graded unit Support Notes

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(SCQF level 8)

Guidance on approaches to delivery and assessment of this Graded unit

Always refer to the latest version of the SQA publication *Guidance for the Implementation of Graded units in Higher National Certificates and Diplomas* prior to start of delivery of this Graded unit.

Delivery of the Graded unit may vary depending on individual college academic calendars. It is envisaged that this Graded unit may be started approximately half way through the learner's studies, with an increasing amount of the time available for the Graded unit being spent towards the end of the course. It is not intended that any new knowledge or skills are taught during delivery of the Graded unit. Instead, the Graded unit should be used to allow the learner to consolidate existing knowledge and skills. The lecturer's time will be spent discussing individual learner work. It is envisaged that the Graded unit 2 will reflect the learner's skills and the project undertaken will be suited to these skills. A final product is required as the emphasis is on the application of the learner's skills. This helps ensure that learners choosing differing projects have equal opportunities to succeed in this unit.

The project should be designed to meet the expectations of the aims and objectives of the HND Computer Games Development award which are:

- ◆ To develop a range of specialist skills in computer games development.
- ◆ To prepare learners for employment in the games industry.
- ◆ To prepare learners for progression to further study in *Games Programming, Games Design, and Development, 3D Computer Arts/Modelling*, or any other related discipline.
- ◆ To conduct independent project work involving the integration and application of a variety of skills within a determined time scale.
- ◆ To develop the Core Skill of Problem Solving.

The assessor should meet the learner at certain milestones to discuss their progress through the stages. These milestones should be determined from discussions with the assessor and the learner. This should be treated by the assessor as a management review of the learner's activities, keeping track of the progress of the project and comparing the actual with the planned progress. This opportunity will allow the assessor to modify deliverable dates (in agreement with the learner) so that the learner manages to complete the work in the required time. An assessor should take a 'project' approach to this Graded unit with a learner delivering a coherent piece of work. The project undertaken should provide the learner with the opportunity to develop knowledge and skills gained in the other units of study.

An assessor should ensure that the project allows a learner to produce the required evidence at SCQF level 8.

Higher National Project-based Graded unit Support Notes (cont)

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Planning Stage

It is recommended that the following points are addressed in the Planning Report:

- ◆ Interpretation of the brief (what is involved in the project).
- ◆ Aims of the project assignment.
- ◆ Concept development, eg a one page pitch of the game idea.
- ◆ Analysis of factors influencing the project including functional and non-functional requirements and constraints.
- ◆ A proposed approach the project taking account of the resources, time, rejected approaches, etc. with justification.
- ◆ Information sources used.
- ◆ Identification of resources, and materials required and how they will be accessed/obtained.

A formal project plan should be developed with realistic timescales and identifying:

- ◆ Timescales/schedules for each stage and overall completion
- ◆ Milestones and deliverables
- ◆ Main tasks
- ◆ Resources

Developing Stage

The Design documentation should comprise a report or portfolio which includes:

- ◆ Design and detailed documentation of the game level(s) using appropriate design principles with justification.
- ◆ Flowcharts.
- ◆ Sketches/artwork and/or storyboards.
- ◆ Audio requirements.
- ◆ Test plans for both technical and user testing.

Implementation of the solution should make effective use of the development tools throughout including commented code and provide evidence of tracking the implementation

Testing should be carried out using the test plans designed earlier in the project cycle. Technical testing should evidence specific detailed tests, their expected Outcome, actual Outcome and any changes or amendments which had to be carried out to make the product fully functional. User testing should be documented and where appropriate changes made and recorded to improve the user experience.

Higher National Project-based Graded unit Support Notes (cont)

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Evaluating Stage

An evaluation report should be produced requiring reflection on the success of the project and to what extent the product meets the requirements of the brief. The personal diary or log of activity will be a useful reference point along with results of technical and user testing. The report should include a summary of the assignment, commentary on the effectiveness of the process and any modification required to the plan along with identified strengths and weaknesses of the final product and recommendations for future improvements.

Plagiarism

Plagiarism is a major issue for assessors in education and the assessor must ensure the authenticity of the learner evidence

Assessors are required to ensure the authenticity of the learner's work. Regular progress meetings are one way of ensuring that the learner's work is their own. The opportunity should be taken at these meetings to use probing questions to authenticate the assessment material. Plagiarism is a potential issue with written work. Assessors must ensure that the learner is aware of their centre's plagiarism policy and ensure that submitted material is consistent with that policy. It is recommended that learners should be issued with a statement on the centre's policy on plagiarism prior to starting the assessment. Further advice about plagiarism is available from SQA.

It is important that learners receive regular feedback during the course of the project to ensure that each learner has passed each stage of the project. A learner may obtain an idea of their expected grade. When giving feedback to learners it is highly recommended that it is grading that is discussed and not individual marks.

Guidance on Grade Related Criteria

This guide is intended to give further detailed advice on differentiating between a grade A and a grade C learner.

'Has extensive evidence for all three stages of the project produced to a high standard, and is quite clearly inter-related' (Grade A) compared with 'has sufficient evidence for all three stages of the project and is produced overall to an adequate standard' (Grade C).

This statement is about the quality and quantity of evidence produced. A grade A learner will produced detailed evidence which is relevant and of high quality. There will be evidence of background research and analysis along with significant input at development stage in terms of design and implementation. The evidence will fully address each requirement and will be presented in a logical, clear format. A grade C learner will provide evidence to meet the minimum Evidence Requirements although the quality and quantity of documentation along with the final game may show inconsistencies.

'Demonstrates an accurate and insightful interpretation of the project brief' (Grade A) compared with 'demonstrates an acceptable interpretation of the project brief' (Grade C).

Higher National Project-based Graded unit Support Notes (cont)

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This statement is about the ability of the learner to analyse what is required in the given brief and demonstrate detailed knowledge and a high level of understanding in the proposed response (Grade A), compared with a learner who addresses the brief with a more basic response which lacks detail (Grade C).

'Is the product of successful project management of all tasks associated with the project brief' (Grade A) compared with 'shows a degree of project management of most tasks associated with the project brief' (Grade C).

This statement is about evidence of carrying out a realistic plan of activity and monitoring progress over the term of the project, modifying the plan where necessary (Grade A) compared with an approach that may be slightly more haphazard where the project plan lacks detail and causes timescale or quality issues (Grade C).

'Is clear and well-structured throughout and the language used is of a uniformly high standard in terms of level, accuracy and technical content' (Grade A) compared with 'the language used is adequate in terms of level, accuracy and technical content' (Grade C).

This statement distinguishes between a learner who consistently uses appropriate and high standard written communication within a well-structured set of evidence along with relevant technical terminology where appropriate (Grade A), compared with a learner who conveys written information adequately but has limited use of technical terminology and produces an inconsistent quality of portfolio (Grade C).

'Effectively consolidates and integrates the required knowledge and skills' compared with 'consolidates and integrates knowledge and skills but this may lack some continuity and consistency' (Grade C).

This statement is about the seamlessness and consistency of the final submission. A Grade A learner will evidence a high degree of knowledge and skills in all aspects of the project resulting in a polished final submission both in terms of the game and the supporting documentation. A Grade C learner will show satisfactory levels of knowledge and skills and the final submission will lack consistency in quality and content in terms of the game and/or the supporting documentation.

'Demonstrates the learner's ability to work autonomously with minimum support or revision within the allocated timescales' (Grade A) compared with 'has required additional support and revision during the project and may require prompting to meet deadlines' (Grade C).

A Grade A learner will be a confident worker who can cope with all aspects of the project with only a 'light touch' in terms of lecturer support, whereas a Grade C learner will need some support to cope with challenges over the course of the project and may struggle to meet deadlines unless prompted.

Higher National Project-based Graded unit Support Notes (cont)

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Opportunities for developing Core and other essential skills

Throughout the natural process of preparation and production of evidence for this project the learner will develop and demonstrate a range of elements of each Core Skill as follows:

Problem Solving — automatic certification at SCQF level 6.

Communication — analysing the requirements of the task and presenting information and ideas in written format along with evaluating the project, the product and personal performance.

Numeracy — using mathematics in the context of computer game programming.

Information and Communication Technology (ICT) — using a range of software in the planning and production of the game.

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

Computational thinking — analysing the requirements of the project using abstraction and decomposition and programming the solution using algorithms.

History of changes to Graded unit

Version	Description of change	Date
02	Core Skill Problem Solving at SCQF level 6 embedded.	July 17
03	Update of Conditions of Assessment	July 18

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FURTHER INFORMATION: Call SQA's Customer Contact Centre on 44 (0) 141 500 5030 or 0345 279 1000.

General information for learners

Graded unit title: Computer Games Development: Graded unit 2 (SCQF level 8)

This unit has been designed to help you achieve the principal aims of the HND Computer Games Development award and to assess your knowledge and skills relative to the mandatory subjects of the course framework.

This will be achieved by the resolution of a project brief, allowing you to explore a range of solutions, arrive at an appropriate and effective resolution and communicate the solutions in an effective manner. Your lecturer will take on the role of facilitator and, at times, engage you as a professional routinely involved in game design and development.

There are three distinct phases to the project — Planning, Developing and Evaluating, worth respectively 20%, 60% and 20% of the total marks awarded for the unit.

In the Planning stage of the Project, you will be expected to analyse the project, and produce a project plan and some initial concept development plans.

In the Developing stage of the Project you will be expected to adhere to the project plan, explore and consider possible solutions and create a game in accordance with the brief using appropriate game development tools. The game produced will be substantiated by clear support documentation, including identification of game requirements, art work/models/sketches, flowcharts, maps, test logs and any other relevant documentation.

In the Evaluating stage of the Project you will be expected to consider the success and efficacy of your game solution. You will provide a presentation of your final solutions with recommendations for future improvements and an overall reflection of the development experience.

The unit is graded (A–C) based on the quality and consistency of the work you have produced throughout the project.

The unit is largely practical in nature, requiring you to have individual access to a computer workstation. A computer workstation is defined as hardware and software, which will enable an operator to generate (and regenerate) the game at an acceptable processor speed. Additionally, you will have the opportunity within this unit to develop Core Skills in *Problem Solving* at SCQF level 6.

This Unit has the Core Skill of Problem Solving embedded in it, so when you achieve this Unit your Core Skills profile will be updated to show that you have achieved Problem Solving at SCQF level 6.