

Higher National Graded Unit Specification

General Information for Centres

This Graded Unit has been validated as part of the Applied Sciences Group Award. Centres are required to develop the assessment instrument in accordance with this validated specification. Centres wishing to use another type of Graded Unit or assessment instrument are required to submit proposals detailing the justification for change for validation.

Graded Unit Title: Applied Sciences: Graded Unit 1

Graded Unit Code: DJ89 34

Type of Graded Unit: Project

Assessment Instrument: Investigation Report

Credit points and level: 1 HN credit at SCQF level 7: (8 SCQF credit points at SCQF level 7*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Purpose: This Graded Unit is designed to provide evidence that the candidate has achieved the following principal aims of the HNC Applied Sciences:

- ◆ developing candidates' knowledge and skills such as planning, developing and evaluating
- ◆ developing employment skills and enhancing candidates' employment prospects
- ◆ enabling progression within the Scottish Credit and Qualifications Framework (SCQF)
- ◆ developing transferable skills including core skills
- ◆ preparing for employment in a Science-related post at technician or professional level
- ◆ developing a range of vocational skills appropriate to employment at technician or professional level in the Science sector

Recommended Prior Knowledge and Skills: It is recommended that the candidate should have completed or be in the process of completing the following Units relating to the above specific aims prior to undertaking this Graded Unit:

- ◆ DG70 34 Presentation Skills in Science
- ◆ D75X 34 Information Technology: Applications Software 1
- ◆ DF82 34 Quality and Health and Safety Systems in Science Industries
- ◆ DH2K 34 Fundamental Chemistry: Theory and Practice
- ◆ DJ1K 34 Cell Biology: Theory and Practice or DH2J 34 Biochemistry: Theory and Practice
- ◆ DN8C 34 Statistics for Science 1 or DN8D 33 Mathematics for Science 1

General Information for Centres (cont)

Core Skills: The achievement of this Unit gives automatic certification of the following:

Problem Solving at SCQF level 5

Assessment: This Graded Unit will be assessed by the use of a scientific report. The ‘fleshed-out’ Investigation Brief should provide the candidate with the opportunity to produce evidence that demonstrates she/he has met the aims of the Group Award that this Graded Unit covers.

An exemplar instrument of assessment with marking guidelines has been produced to indicate the national standard of achievement required at SCQF level 7.

Administrative Information

Graded Unit Code: DJ89 34

Graded Unit Title: Applied Sciences: Graded Unit 1

Original date of publication: August 2004

Version: 04 (March 2012)

History of Changes:

Version	Description of change	Date
02	Graded Unit specification revised giving fuller guidance, clarifying the evidence required and ensuring the Graded Unit and Graded Unit Assessment Exemplar match.	04/10/06
03	Updating of Graded Unit checklist.	12/09/07
04	Amendments made to pages 9 - 11.	21/03/12

Source: SQA

© Scottish Qualifications Authority 2005, 2006, 2007, 2012

This publication may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged.

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of Higher National qualifications.

Additional copies of this Graded Unit specification if sourced by the Scottish Qualifications Authority can be purchased from the Scottish Qualifications Authority. Please contact the Customer Contact Centre for further details, telephone 0845 279 1000.

Higher National Graded Unit Specification: Instructions for designing the assessment task and assessing candidates

Graded Unit Title: Applied Sciences: Graded Unit 1

Conditions of Assessment

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

The planning stage of the assessment task should be assessed before continuing to the following two stages. The assessment evidence should be marked as soon as possible after the completion date. The final grade given should reflect the quality of the candidate's evidence at the time of the completion date.

Re-assessment of this Graded Unit should be based on a significantly different assessment task.

At this level, candidates should work independently. It is up to Centres to take reasonable steps to ensure that the project is the work of the candidate. For example, Centres may wish to informally question candidates at various stages to check on their knowledge and understanding of the project on which they have embarked. Centres should ensure that where research etc, is carried out in other establishments or under the supervision of others that the candidate does not receive undue assistance.

Instructions for designing the assessment task

The assessment task is a project. This will take the form of an investigation on a scientific topic relevant to the subject areas covered by Units forming the HNC Applied Sciences award. The focus will depend on the specialism that has been chosen in the HNC.

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

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

The assessment task must require the candidate to:

- ◆ analyse the task and decide on a course of action for undertaking the project
- ◆ plan and organise work and carry it through to completion
- ◆ reflect on what has been done and draw conclusions for the future
- ◆ produce evidence of meeting the aims which this Graded Unit has been designed to cover

Guidance on grading candidates

Candidates who meet the minimum Evidence Requirements will have their achievement graded as C — competent, or A — highly competent or B somewhere between A and C. The grade related criteria to be used to judge candidate performance for this Graded Unit is specified in the following table.

Higher National Graded Unit specification: Instructions for designing the assessment task and assessing candidates (cont)

Grade A	Grade C
<p>Is a seamless, coherent piece of work which:</p> <ul style="list-style-type: none"> ◆ has sufficient evidence of the three essential phases of the project that is produced to a high standard, and is clearly inter-related ◆ demonstrates an accurate and insightful interpretation of the project brief ◆ is highly focused and relevant to the tasks associated with the project brief ◆ provides the initial project timetable containing a comprehensive list of project activities and timings ◆ is clear and well structured throughout with language of a high standard in terms of level, accuracy and technical content used ◆ effectively consolidates and integrates required knowledge, and skills ◆ identifies clear and full details of the new knowledge and skills she/he has developed as a result of doing the project such as keeping deadlines, researching expert sources ◆ the candidate undertakes the project with the minimum of supervision ◆ the candidate demonstrates a high level of self motivation throughout the project ◆ the candidate undertakes additional research well beyond that demanded by the project 	<p>Is a co-ordinated piece of work which:</p> <ul style="list-style-type: none"> ◆ has sufficient evidence of the three essential phases of the project, that is produced to an adequate standard ◆ demonstrates an acceptable interpretation of the project brief ◆ is focused and relevant to the tasks associated with the project brief ◆ provides the initial project timetable containing all essential project activities and timings ◆ is satisfactorily structured with adequate language in terms of level, accuracy and technical content used ◆ consolidates and integrates knowledge and skills but this may lack some continuity and consistency ◆ provides at least three examples of new knowledge and skills she/he has developed as a result of doing the project ◆ the candidate undertakes the project with necessary interventions from the project supervisor to ensure the project remains on track ◆ the candidate demonstrates an acceptable level of motivation ◆ none

The project will be marked out of 100. Assessors will mark each stage of the project, taking into account the criteria outlined. The marks will then be aggregated to arrive at an overall mark for the project. Assessors will then assign an overall grade to the candidate for this Graded Unit based on the following grade boundaries.

A = 70% — 100%

B = 60% — 69%

C = 50% — 59%

Note: the candidate must achieve all of the minimum evidence specified below for each stage of the project in order to achieve the Graded Unit.

Higher National Graded Unit Specification: Instructions for designing the assessment task and assessing candidates (cont)

Important Note: Centres **must** complete the following Grading Checklist for each Applied Science Project. Completed checklists will be used as part of the external verification process to ensure the accuracy and consistency of grading between candidates in the centre and across the centres.

Notes on completion of the Grading Checklist are shown on page 9.

Evidence Requirements

The project consists of three stages: planning; developing; and evaluating. The following table specifies the minimum evidence required to pass each stage. The Grading Checklist indicates how the Grade should be assigned.

Note: The candidate must achieve **all of the minimum evidence** specified below for each stage of the project in order to pass the Graded Unit.

Candidates failing to achieve any of the minimum evidence requirements for all three sections should be offered one chance to re-submit the outstanding evidence. Re-submitted work should be awarded marks using a scale based on 50% of the original marks available.

A candidate may be awarded less than the mark allocation for a grade (in appropriate circumstances).

Project Stage	Minimum Evidence Requirements
Stage 1 — Planning	<p><i>An Action Plan</i> which includes:</p> <ul style="list-style-type: none">◆ the aims and objectives of the project◆ timescales for achieving these aims and objectives◆ a clear, concise and structured plan (approximately 1000 words)◆ identification of the topic for research◆ identification of the main issues for research◆ identification of the methods of research and sources to be used <p><i>The candidate must address all of the above in order to pass the Planning stage, and also meet the overall minimum pass for that stage. This will account for 20% of the assessment.</i></p>

Higher National Graded Unit Specification: Instructions for designing the assessment task and assessing candidates (cont)

Project Stage	Minimum Evidence Requirements
Stage 2 — Developing	<p><i>An Investigation Report</i> including evidence of:</p> <ul style="list-style-type: none"> ◆ collection and collation of data ◆ interpretation/analysis of data ◆ summary of the findings and conclusions drawn <p>The report should also include:</p> <ul style="list-style-type: none"> ◆ a contents page ◆ a list of acknowledgements of sources and references <p><i>The candidate must address all of the above in order to pass the Developing stage, and also meet the overall minimum pass mark for that stage. This will account for 60% of the assessment.</i></p>
Stage 3 — Evaluating	<p><i>An Evaluation Report</i> which should:</p> <ul style="list-style-type: none"> ◆ briefly outline the investigation ◆ evaluate and justify the extent to which the aims and objectives of the action plan have been met ◆ assess the effectiveness of the research methods used ◆ assess the strengths and weaknesses of the output of the investigation report ◆ summarise any unforeseen events and how they are handled ◆ identify and justify knowledge and skills which have been gained and/or developed <p><i>The candidate must address all of the above in order to pass the Evaluating stage, and also meet the overall minimum pass mark for that stage. This will account for 20% of the assessment.</i></p>

To pass the Graded Unit DJ89 34 candidates must achieve 50% of the total marks and all minimum evidence requirements for each of the three sections.

Candidates achieving an overall percentage of between 50-59% for the Unit will be awarded a Grade C.

Candidates achieving an overall percentage of between 60-69% for the Unit will be awarded a Grade B

Candidates achieving an overall percentage of 70% and over for the Unit will be awarded a Grade A.

Scottish Qualifications Authority

Applied Sciences: Group Award Graded Unit 1 (Project)

Grading Unit Checklist

Centre Name:

Centre Number:

Candidate Name:

Candidate Number:

Higher National Graded Unit specification: Instructions for designing the assessment task and assessing candidates (cont)

Support Notes

Applied Science Graded Unit 1

Grading Checklist

Centres may provide additional comments in support of their grading decisions. A candidate may be awarded less than the mark allocation for a grade C in appropriate circumstances.

Stage 1: Planning Stage — The Action Plan

Evidence Requirements	Maximum Mark	Mark Grade C	Mark Awarded
1.1 ♦ The aims and objectives of the Project	2		
1.2 ♦ Timescales for achieving these aims and objectives	2		
1.3 ♦ The evidence is a concise, structured plan (approximately 1000 words)	2		
1.4 ♦ An introduction to the topic to be investigated	4		
1.5 ♦ Identification of the main issues for research	4		
1.6 ♦ Identify and describing the methods of research and sources to be used	4		
1.7 ♦ Works with little supervision and high level of motivation to produce a plan of a high standard	2		
Total:	20	10	

Stage 2: Developing Stage — The Investigation Report

Evidence Requirements	Maximum Mark	Mark Grade C	Mark Awarded
2.1 ♦ Collection and collation of information/data	23		
(a) Use a variety of different resource types. Where resource types are restricted solely to published sources, a maximum of 2 marks will be awarded (4)	4		
(b) Uses different resources (1/2 mark per resource)	4		
(c) Introduction section contains accurate details of topic and summary of what is covered by investigation	3		
(d) Gathers appropriate evidence – text contains 10 relevant pieces of substantive scientific information that are commensurate with SCQF level 7	10		
(f) Develops a coherent line of thought such that report sections link appropriately to each other and to underpinning knowledge	2		

Higher National Graded Unit specification: Instructions for designing the assessment task and assessing candidates (cont)

Evidence Requirements (cont)	Maximum Mark	Mark Grade C	Mark Awarded
2.2 ♦ Interpretation/analysis of information/data (a) Correctly interprets and analyses the assimilated information (b) Use of appropriate statistical methods of data analysis to facilitate interpretation and presentation	14		
2.3 ♦ Summary of substantial conclusions drawn from the findings, commensurate with SCQF level 7	10		
2.4 ♦ A contents page	1		
2.5 ♦ Appropriate referencing of sources and references including full and appropriate referencing within the report	4		
2.6 ♦ Clear, well structured with high levels of language in terms of level, accuracy and technical content	4		
2.7 ♦ Works with little supervision and high level of motivation to produce a report of high standard	4		
Total:	60	30	

Higher National Graded Unit specification: Instructions for designing the assessment task and assessing candidates (cont)

Stage 3: Evaluation Stage — The Evaluation Report

Evidence Requirements	Maximum Mark	Mark Grade C	Mark Awarded
3.1 ♦ Brief outline of the investigation (investigation remit, research methods used, resources used)	2		
3.2 ♦ The extent to which the investigation covers the topic and action plan is evaluated and justified	4		
3.3 ♦ Assessment of the effectiveness of the research methods	4		
3.4 ♦ Assessment of the strengths and weaknesses of the output of the investigation report (two strengths/two weaknesses)	4		
3.5 ♦ Summary of any difficulties encountered and how they were handled	2		
3.6 ♦ Identification and justification of specific knowledge and skills which have been gained and/or developed	4		
Total:	20	10	

Guidance to Centres

Centres are strongly advised to give candidates adequate time to choose their topic and carry out the planning stage. Careful planning enables the candidate to complete the following tasks of developing and of evaluating more effectively.

The briefing task sheet for the candidates should include clear indications of how the Unit is being assessed so that the candidate can provide all the evidence required to complete the Unit. It is strongly advised that candidates are provided with a detailed description of the requirements of the planning stage to enable them to carry out the task prior to proceeding to the development stage. It is advisable that the planning stage should be assessed prior to the candidate progressing to the developing stage.

However if the development stage does not progress as anticipated the candidates may return to their plans and modify them. If changes to plans are needed during the developing stage this can be reflected on during the evaluation.

The evaluation stage develops the reflective skills of the candidates.

Disabled candidates and/or those with additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

General Information for Candidates

This Unit is project-based and is assessed by an investigation that you will carry out using a variety of research methods and tools and the report of that investigation. The topic of research will be left to your choice with advice from your Tutor. This enables you to find out more about an area of applied science that interests you particularly and may reflect some developing fields of applied science or an interest at your employment.

The project will be marked out of 100. To pass the Graded Unit you must achieve 50% of the total marks and all minimum evidence requirements for each of the three sections.

If you achieve an overall percentage of between 50–59% for the Unit you will be awarded a Grade C.

If you achieve an overall percentage of between 60–69% for the Unit you will be awarded a Grade B.

If you achieve an overall percentage of 70% and over for the Unit you will be awarded a Grade A.